Mitigation Monitoring

To: Thomas Brooks
From: Allen Plocher, Dennis Keene, Brad Zercher
Date: 22 November 2010
Re: Mitigation Monitoring– Cahokia Site/Multi-Use Wetland Compensation
St. Clair County
Date Investigated: 12 October 2010

Site Description

Year three wetland mitigation monitoring was carried out on a 26.3 ha (65 acre) tract near Cahokia, IL in St. Clair Co. (Legal location: T 1 N, R 10 W, Sect. 10, W/2 NE/4, E/2, NW/4. The site occurs on the Mississippi River floodplain and the presettlement environment consisted of mesic and hydric floodplain forest, wet shrubland, marsh and backwater ponds and sloughs. The surrounding land use is primarily cropland and developed land. A mitigation site assessment was carried out at this location in March 2000. At that time the northern half of the site was in soybean and the southern half supported various wetlands. The NRCS mapped the agricultural portion of the property as Prior Converted Cropland (PC). The property was purchased for wetland mitigation in November 2000 and agricultural activities ceased at that time. The northern half of the site has been mowed periodically, most recently in 2005. As part of an effort to establish the State and Federally listed *Boltonia decurrens*, a 4 acre area in the northern part of the site was disked and seeded with *Boltonia* in August 2003. In September 2004, no *Boltonia* plants were located. In June 2005, 40 greenhouse reared *Boltonia* were planted at the site. In October 2006, seven of the planted *Boltonia* remained and one plant, presumably from seed, was located just outside the planted area. By October 2007, no *Boltonia decurrens* individuals survived at this site. Our current feelings are that the site was too wet when first disked, providing an unsuitably rough seedbed for this small seeded species. We also now feel that this site is not environmentally suited for *Boltonia decurrens*. The sort of severe riverine flooding necessary to scour soil and produce bare areas for establishment does not occur at this location. As of October 2008, the wetland restoration related activities at this site consist of taking cropland, mapped as Prior Converted, out of agriculture, periodic mowing to maintain an herbaceous plant community, and a (so far) unsuccessful attempt to establish State and Federally listed *Boltonia decurrens*.

Hydrology

The hydrologic inputs at this site are backflow from the Mississippi River, ditch overflow, precipitation, and runoff from adjacent uplands. Water leaves the site by evapotranspiration, sheetflow to the south and ditchflow to Harding Ditch. Backflow from the Mississippi deposits sediment on the site. The following hydrologic alterations are currently in effect: 1. Ditch/culvert system leads into a large canal to the south (this is now blocked by a beaver dam). 2. Levees separate the site from Harding Ditch and the Mississippi River. The topography of the site is level to depressional and elevation is 123 m (405 ft). In 2010, with precipitation 130% of normal, 51 out of 65 acres supported wetland hydrology In 2009, with precipitation 110% of normal, 50.6 out of 65 acres

supported wetland hydrology (Benton et al. 2009, Benton et al. 2010). Hydrophytic vegetation is present on 35.92 acres. In general, the southern and northern parts of the site are wetland. Approximately 25 acres in the central part of the site are at a higher elevation and support nonwetland. The Mississippi has a watershed greater than 25,920 km^2 (10,000 mi^2). The hydrologic basin unit code is 07140101, Mississippi Tribs, Hartford to Reily Lake, Mississippi River, Upper.

Soils

The St. Clair Co. Soil Survey shows Darwin silty clay, Fluvaquent and Borrow Pit mapped at this site. Cores were taken in the project area and Zipp silty clay, poorly drained, was determined to be present on most of the site. A portion of the site is underlain by soil disturbed by excavation (probably previously Zipp). This soil exhibits slow to very slow permeability. The potential for occasional flooding exists. Zipp is a floodplain soil formed in silty clay alluvium under forest conditions and is a hydric soil.

Vegetation

The southern portion of this site supports marsh, floodplain forest and wet shrubland. These communities now hold deeper water due to a beaver dam on the outlet ditch and occupy about 15.3 acres. Floristic Qualities of marsh, wet shrubland and wet forbland have improved slightly since 2009. The marsh is of good natural quality (FQI = 25.3), while the quality of the forest and shrubland is fair (FQI 17.1 – 17.4). Most of this area appears to have been excavated for fill material many years ago. The northern part of the marsh was apparently disked and cropped in drier years. Since cessation of agriculture, part of this area has reverted to young floodplain forest. Part of the northern part of the site has developed into wet forbland, due to the cessation of agriculture followed by periodic mowing. Dominant vegetation here is *Polygonum amphibium, Echinochloa muricata* and *Carex annectans* and natural quality is has improved (FQI = 20.1). The southwestern and northeastern parts of this area are dominated by *Setaria faberi* and *Solidago canadensis* and are not wetland. A sizable area in the center of the site has not been mowed, is at higher elevation, and is rapidly developing into nonwetland mesic forest. It seems clear that without periodic mowing, almost all of the site that was previously affected by agriculture will become either mesic forest or wet floodplain forest (about 4 acres of the wettest occasionally previously cropped area should remain marsh).

Summary

In the ten years after agricultural activity ceased, it appears as if about half of the area previously cropped has developed into wetland (24 acres). Part of the area periodically mowed is an herbaceous community (wet forbland). Part of the unmown area is young floodplain forest while the wettest part is a marsh. Natural quality of these communities is fair to good (12.7 – 20.1). Percent nonweedy native species ranges from 85% in the unmown areas to 75% in the mowed areas. A number of undesirable species are fairly abundant, however – *Lonicera maackii, Eleagnus umbellata* and *Sorghum halapense* in the non-wetland shrubland, and *Typha angustifolia* and *Phragmites australis* in the marsh. All but the wettest areas will become forest without vegetation management.

Former Tiernan Property, New River Crossing
Potential Wetland Mitigation Site
(FAP 999)

Estimated Areal Extent of 2010 Wetland Hydrology

September 1, 2009 through August 31, 2010

Map based on USGS digital orthophotograph, Cahokia SW quarter quadrangle produced from 04/02/98 aerial photography (ISGS 2000)

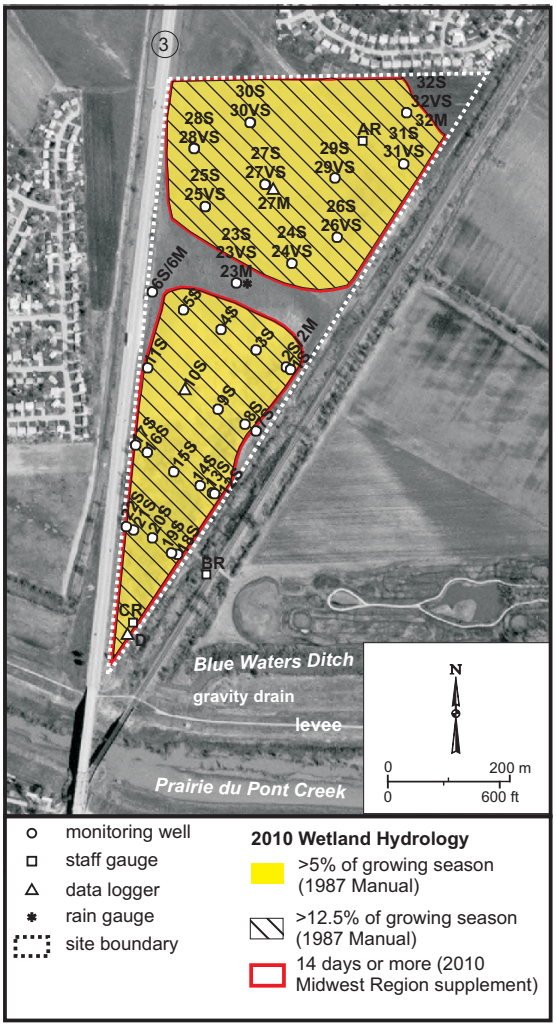

Table 1. Plant Communities within the Project Area

1. Wet Forbland - 20.66 acres (northern third of tract)

Dominant Species
Understory –*Polygonum amphibium, Echinochloa muricata, Carex annectans*

2. Marsh – 5.79 acres (southern portion of tract)

Dominant Species
Understory – *Typha angustifolia, Typha latifolia, Polygonum amphibium, Carex hyalinolepis, Leersia oryzoides*

3. Wet Floodplain Forest – 3.18 acres (southern portion of tract)

Dominant Species
Overstory – *Populus deltoides, Acer saccharinum*
Sapling Layer – *Acer saccharinum*
Understory- *Carex hyalinolepis, Aster simplex, Equisetum arvense*

4. Young Floodplain Forest - 2.37 acres (southern portion of tract)

Dominant Species
Overstory – *Acer negundo*
Sapling Layer – *Acer saccharinum, Acer negundo*
Understory- *Carex hyalinolepis, Boehmeria cylindrica, Geum canadense*

5. Wet Shrubland – 3.92 acres (southern portion of tract)

Dominant Species
Sapling/Shrub Layer- *Salix exigua, Acer saccharinum, Cephalanthus occidentalis*
Understory – *Phalaris arundinacea, Polygonum amphibium, Carex hyalinolepis*

6. Forbland – 15.12 acres (northwestern and northern portions of tract)

Dominant Species
Understory – *Solidago canadensis, Setaria faberi*

7. Shrubland - 9.23 acres (west central portion of tract)

Dominant Species
Sapling/Shrub Layer –*Ulmus pumila, Lonicera maackii, Cornus drummondii*
Understory – *Festuca pratensis, Solidago canadensis, Setaria faberi*

Literature Cited

Benton, S., K. Bryant, M. Campbell, K. Carr, C. Knight, A. Knight, J. Miner, E. Plankell, and G. Pociask. 2010. Annual Report for Active IDOT Wetland Compensation and Monitoring Sites: Former Tiernan Site– 2010. Submitted to Illinois Department of Transportation. Illinois State Geological Survey, Champaign, IL. 17 pp.

Benton, S., C. Fucciolo, K. Bryant, M. Campbell, K. Carr, C. Knight, A. Knight, J. Miner, E. Plankell, and G. Pociask. 2009. Annual Report for Active IDOT Wetland Compensation and Monitoring Sites: Former Tiernan Site– 2009. Submitted to Illinois Department of Transportation. Illinois State Geological Survey, Champaign, IL. 15 pp.

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Plocher, A. and D. Keene. 2000. Mitigation Site Assessment for Tiernan Property. Report for the IDOT. 20 pp.

Reed, P. B. 1988. National list of plants that occur in wetlands: North Central. USFWS, National Wetlands Inventory. NERC-88/18.13. 117 pp.

Taft, J., G. Wilhelm, D. Ladd and L. Masters. 1997. Floristic Quality Assessment for vegetation of Illinois: a method for assessing vegetation integrity. Eriginia 15: 3-95.

Wetland Assessment

The following sources were examined while surveying the project area to determine wetland locations and boundaries: United States Geologic Survey topographic map and National Wetland Inventory map (Cahokia 7.5 minute quadrangle); *Soil Survey of St. Clair Co.;* aerial photographs; *National List of Plant Species That Occur in Wetlands*; *The 1987 Corps of Engineers Wetland Delineation Manual;* and on-site vegetation, soil, and hydrologic indicators. Five sites were investigated and all met the criteria of wetlands. Results of these determinations are summarized on the following pages and are described in more detail on the accompanying forms. Wetland site boundaries were mapped using Trimble GPS (Global Positioning System). The locations of the sites were overlain on Digital Ortho Quads using Arc View 3.2. Printouts of these DOQ's showing the locations of the wetland determination sites are included and the report and shape files of the GIS data are posted on the IDOT ftp site.

A brief functional assessment of each wetland is provided in this report. However, this assessment is not an exhaustive description of the values of the site. The Floristic Quality Index (FQI), Developed by Taft, Ladd, Wilhelm and Masters (*Floristic Quality Assessment for Vegetation in Illinois*, 1997), was applied to the vegetation of the sites not in cultivation. This index should not be used as a substitute for quantitative analysis, but it does provide a measure of floristic integrity. The FQI is calculated as follows: $I=R/\sqrt{N}$, where R represents the sum of the numerical ratings for all species recorded in the area, and N represents the number of recorded native species. The mean C is calculated as: mean $C=R/N$. FQI values of less than 10 indicate low natural quality, while sites with values of 20 or more have at least some evidence of native character and may be considered environmental assets (Appendix 1).

Site Summaries

Site 1: This wet forbland occupies the northern third of the tract. Hydrophytic vegetation, hydric soils and wetland hydrology are all present. Therefore this site is a wetland. The NRCS classified the site as Prior Converted Cropland (PC). Hydrologic inputs are precipitation, runoff from surrounding uplands, and ditch overflow. Water leaves by evapotranspiration, sheetflow and ditchflow. The site occupies 8.36 ha (20.66 acres) and is uncoded by the NWI. The FQI is 20.1, which is indicative of good natural quality.

Site 2: This marsh occurs in the southern half of the tract. Hydrophytic vegetation, hydric soils and wetland hydrology are present. Therefore the site is a wetland. Hydrologic inputs are precipitation, runoff from surrounding uplands and ditch overflow. Water leaves by evapotranspiration. This site appears to have been excavated. The site occupies 2.34 ha (5.79 acres). The NWI codes the site as PEMC (palustrine, emergent, seasonally flooded). The FQI is 25.3, which is indicative of good natural quality and that the site can be considered an environmental asset.

Site 3: This wet floodplain forest occurs in several areas in the southern half of the tract. Hydrophytic vegetation, hydric soils and wetland hydrology are present. Therefore the site is a wetland. Hydrologic inputs are precipitation, runoff from surrounding uplands

and ditch overflow. Water leaves by evapotranspiration, sheetflow and ditchflow. This site appears to have been shallowly excavated. The site is 1.29 ha (3.18 acres). The NWI codes the site as PEMC (palustrine, emergent, seasonally flooded). The FQI is 17.1, which is indicative of fair natural quality.

Site 4: This young floodplain forest occurs in the southern half of the tract. Hydrophytic vegetation, hydric soils and wetland hydrology are present. Therefore the site is a wetland. Hydrologic inputs are precipitation, runoff from surrounding uplands and ditch overflow. Water leaves by evapotranspiration and sheetflow. The site is 0.96 ha (2.37 acres). The NWI codes the site as PEMC (palustrine, emergent, seasonally flooded). The FQI is 15.3, which is indicative of fair natural quality.

Site 5: This wet shrubland occurs in the southern portion of the tract. Hydrophytic vegetation, hydric soils and wetland hydrology are present. Therefore the site is a wetland. Hydrologic inputs are precipitation, runoff from surrounding uplands and ditch overflow. Water leaves by evapotranspiration and ditchflow. This site appears to have been shallowly excavated. The site is 1.59 ha (3.92 acres). The NWI codes the site as PEMC (palustrine, emergent, seasonally flooded). The FQI is 17.4, which is indicative of fair natural quality.

Appendix 1: Wetland Determinations

and Species Lists

ROUTINE ON-SITE WETLAND DETERMINATION
Site 1 (page 1 of 4)

Field Investigators: Plocher, Keene, Zercher **Date:** 12 October 2010
Sequence No.: **Project Name:** Cahokia Compensation Site
State: Illinois **County:** St. Clair **Applicant:** IDOT District 8
Site Name: Wet Forbland
Legal Description: T 1 N, R 10 W, Sect.10, NW/4 NE/4
Location: northern third of tract

Do normal environmental conditions exist at this site? Yes: X No:
Has the vegetation, soil, or hydrology been significantly disturbed? Yes: No: X

VEGETATION

Dominant Plant Species	Stratum	Indicator Status
1. *Polygonum amphibium*	herb	OBL
2. *Echinochloa muricata*	herb	OBL
3. *Carex annectans*	herb	FACW

Percent of dominant species that are OBL, FACW, FAC+, or FAC: 100%

Hydrophytic vegetation: Yes: X No:
Rationale: More than 50% of dominants are OBL, FACW, FAC+, or FAC.

SOILS

Series and phase: Zipp silty clay
On St. Clair County hydric soils list? Yes: X No:
Is the soil a histosol? Yes: No: X
Histic epipedon present? Yes: No: X
Redox concentrations: Yes: X No:
Redox depletions: Yes: No: X
Matrix color: N 5/
Other indicators: This soil is found in a low area.

Hydric soils: Yes: X No:
Rationale: The Natural Resources Conservation Service classifies Zipp silty clay loam as having aquic conditions. This soil has iron masses and a gleyed matrix. Furthermore, this soil meets the NRCS hydric soil indicator F2 (loamy gleyed matrix). These characteristics are evidence of a hydric soil.

ROUTINE ON-SITE WETLAND DETERMINATION
Site 1 (page 2 of 4)

Field Investigators: Plocher, Keene, Zercher **Date:** 12 October 2010
Sequence No.: **Project Name:** Cahokia Compensation Site
State: Illinois **County:** St. Clair **Applicant:** IDOT District 8
Site Name: Wet Forbland
Legal Description: T 1 N, R 10 W, Sect.10, NW/4 NE/4
Location: northern third of tract

HYDROLOGY

Inundated: Yes: No: X Depth of standing water: NA
Depth to saturated soil: > 1 m (> 3.3 ft)
Overview of hydrological flow through the system: Primary hydrologic inputs to this site are precipitation, runoff from the surrounding uplands and ditch overflow. Evapotranspiration and sheetflow are the major outputs.
Size of watershed: < 2.59 km^2 (< 1 mi^2)
Other field evidence observed: Level landscape position on floodplain
Wetland hydrology: Yes: X No:
Rationale: Field evidence indicates that this site is inundated or saturated for a sufficient duration to support wetland hydrology

WETLAND DETERMINATION AND RATIONALE:

Is the site a wetland?: Yes: X No:
Rationale: Hydrophytic vegetation, hydric soils and wetland hydrology are all present. Therefore the site is a wetland. The site is not coded as wetland by the NWI. The NRCS coded the site PC (prior converted).

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ROUTINE ON-SITE WETLAND DETERMINATION
Site 1 (page 3 of 4)

Field Investigators: Plocher, Keene, Zercher **Date:** 12 October 2010
Sequence No.: **Project Name:** Cahokia Compensation Site
State: Illinois **County:** St. Clair **Applicant:** IDOT District 8
Site Name: Wet Forbland
Legal Description: T 1 N, R 10 W, Sect.10, NW/4 NE/4
Location: northern third of tract

SPECIES LIST

Scientific name	Common name	Stratum	Wetland indicator status	C*
Acer saccharinum	silver maple	shrub/seedling	FACW	1
Alisma plantago aquatica	water plantain	herb	OBL	2
Ammannia coccinea	ammannia	herb	OBL	5
Apocynum cannabinum	dogbane	herb	FAC	2
Asclepias incarnata	swamp milkweed	herb	OBL	4
Aster pilosus	hairy aster	herb	FACU+	0
Aster simplex	panicled aster	herb	FACW	3
Bacopa rotundifolia	water hyssop	herb	OBL	5
Bidens aristosa	swamp marigold	herb	FACW	1
Bidens frondosa	beggar's ticks	herb	FACW	1
Boehmeria cylindrica	false nettle	herb	OBL	3
Boltonia asteroides	false aster	herb	FACW	5
Cardiospermum halicacabum	balloon vine	herb	FAC	*
Carex annectans	sedge	herb	FACW	3
Carex hyalinolepis	sedge	herb	OBL	4
Carex tribuloides	sedge	herb	FACW+	3
Carya illinoensis	pecan	sapling	FACW	6
Cephalanthus occidentalis	buttonbush	shrub	OBL	4
Commelina diffusa	dayflower	herb	FACW	3
Cornus drummondii	rough leaf dogwood	shrub	FAC	2
Cuscuta gronovii	dodder	herb	FACW	2
Cyperus strigosus	straw colored flatsedge	herb	FACW	0
Desmanthus illinoensis	Illinois bundleflower	herb	FAC-	4
Diospyros virginiana	persimmon	seedling	FAC	2
Echinochloa muricata	barnyard grass	herb	OBL	0
Eleocharis erythropoda	red rooted spikerush	herb	OBL	3
Eleocharis obtusa	spikerush	herb	OBL	2
Eupatorium serotinum	late flowering thoroughwort	herb	FAC+	1

*Coefficient of Conservatism, as developed by Taft, Ladd, Wilhelm and Masters (1997)

Continued on following page

ROUTINE ON-SITE WETLAND DETERMINATION
Site 1 (page 4 of 4)

Field Investigators: Plocher, Keene, Zercher **Date:** 12 October 2010
Sequence No.: **Project Name:** Cahokia Compensation Site
State: Illinois **County:** St. Clair **Applicant:** IDOT District 8
Site Name: Wet Forbland
Legal Description: T 1 N, R 10 W, Sect.10, NW/4 NE/4
Location: northern third of tract

SPECIES LIST (continued)

Scientific name	Common name	Stratum	Wetland indicator status	C**
Fraxinus pennsylvanica	green ash	sapling	FACW	2
Iva annua	sumpweed	herb	FAC	0
Juncus dudleyi	Dudley's rush	herb	FAC	4
Juniperus virginiana	eastern red cedar	shrub	FACU	1
Juglans nigra	black walnut	sapling	FACU	4
Leersia oryzoides	rice cutgrass	herb	OBL	3
Lonicera maackii	Amur honeysuckle	shrub	UPL	*
Ludwigia palustris	marsh seedbox	herb	OBL	4
Lycopus americanus	water horehound	herb	OBL	3
Lythrum alatum	winged loosestrife	herb	OBL	5
Polygonum amphibium	water smartweed	herb	OBL	3
Polygonum pensylvanicum	giant smartweed	herb	FACW+	1
Polygonum ramosissimum	bushy knotweed	herb	FAC-	3
Pyrus calleryana	Bradford pear	shrub	UPL	*
Quercus palustris	pin oak	sapling	FACW	4
Rumex crispus	curly dock	herb	FAC+	*
Rumex verticillatus	swamp dock	herb	OBL	5
Scirpus atrovirens	dark green bulrush	herb	OBL	4
Scirpus fluviatilis	river bulrush	herb	OBL	3
Setaria faberi	giant foxtail	herb	FACU+	*
Solidago canadensis	Canada goldenrod	herb	FACU	1
Strophostyles umbellata	wild bean	herb	FACU	5
Toxicodensron radicans	poison ivy	herb	FAC+	1
Ulmus americana	American elm	shrub	FACW-	5
Ulmus pumila	Siberian elm	shrub	UPL	*
Verbena urticifolia	white vervain	herb	FAC+	3
Vernonia fasciculata	common ironweed	herb	FACW	5
Vitis riparia	riverbank grape	herb	FACW-	2

** Coefficient of Conservatism (Taft et al. 1997) $mCv = \sum C/N = 142/50 = 2.84$
* Non-native species $FQI = \sum C/\sqrt{N} = 142/\sqrt{50} = 20.08$ Quality = good
Percent nonweedy native: 42/56 = 75%

ROUTINE ON-SITE WETLAND DETERMINATION
Site 2 (page 1 of 4)

Field Investigators: Plocher, Keene, Zercher **Date:** 12 October 20100
Sequence No.: **Project Name:** Cahokia Compensation Site
State: Illinois **County:** St. Clair **Applicant:** IDOT District 8
Site Name: Marsh
Legal Description: T 1 N, R 10 W, Sect.10, SE/4 NW/4
Location: southern half of tract

Do normal environmental conditions exist at this site? Yes: X No:
Has the vegetation, soil, or hydrology been significantly disturbed? Yes: No: X

VEGETATION

Dominant Plant Species	Stratum	Indicator Status
1. *Typha angustifolia*	herb	OBL
2. *Typha latifolia*	herb	OBL
3. *Polygonum amphibium*	herb	OBL
4. *Carex hyalinolepis*	herb	OBL
5. *Leersia oryzoides*	herb	OBL

Percent of dominant species that are OBL, FACW, FAC+, or FAC: 100%

Hydrophytic vegetation: Yes: X No:
Rationale: More than 50% of dominants are OBL, FACW, FAC+, or FAC.

SOILS

Series and phase: Undetermined (inundated)
On St. Clair County hydric soils list?: Yes: No: Undet: X
Is the soil a histosol? Yes: No: X
Histic epipedon present? Yes: No: X
Redox concentrations: Yes: No: Undet: X
Redox depletions: Yes: No: Undet: X
Matrix color: NA
Other hydric soil indicators: Soil is saturated and had a hydrogen sulfide odor.

Hydric soils: Yes: X No:
Rationale: This site was inundated. This soil is ponded for a long duration or a very long duration during the growing season. This characteristic is evidence of a hydric soil.

ROUTINE ON-SITE WETLAND DETERMINATION
Site 2 (page 2 of 4)

Field Investigators: Plocher, Keene, Zercher **Date:** 12 October 2010
Sequence No.: **Project Name:** Cahokia Compensation Site
State: Illinois **County:** St. Clair **Applicant:** IDOT District 8
Site Name: Marsh
Legal Description: T 1 N, R 10 W, Sect.10, SE/4 NW/4
Location: southern half of tract

HYDROLOGY

Inundated: Yes: X No: Depth of standing water: 0.25 – 0.91 m (10 – 36 in)
Depth to saturated soil: at surface
Overview of hydrological flow through the system: Primary hydrologic inputs to this site are precipitation, runoff from the surrounding uplands and ditch overflow. Evapotranspiration is the major output.
Size of watershed: < 2.59 km^2 (< 1 mi^2)
Other field evidence observed: This site is depressional. Driftlines and bare ground were observed.
Wetland hydrology: Yes: X No:
Rationale: Field evidence sited above indicates that the site is flooded or saturated for a sufficient period during the growing season to meet the criterion of wetland hydrology.

WETLAND DETERMINATION AND RATIONALE:

Is the site a wetland?: Yes: X No:
Rationale: Hydrophytic vegetation, hydric soils and wetland hydrology are all present. Therefore the site is a wetland. The site is coded by the NWI as PEMC (palustrine, emergent, seasonally flooded).

Determined by: Allen Plocher (vegetation and hydrology
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ROUTINE ON-SITE WETLAND DETERMINATION
Site 2 (page 3 of 4)

Field Investigators: Plocher, Keene, Zercher **Date:** 12 October 2010
Sequence No.: **Project Name:** Cahokia Compensation Site
State: Illinois **County:** St. Clair **Applicant:** IDOT District 8
Site Name: Marsh
Legal Description: T 1 N, R 10 W, Sect.10, SE/4 NW/4
Location: southern half of tract

SPECIES LIST

Scientific name	Common name	Stratum	Wetland indicator status	C**
Acer negundo	box elder	shrub	FACW-	1
Acer saccharinum	silver maple	sapling	FACW	1
Alisma plantago aquatica	water plantain	herb	OBL	2
Ammannia coccinea	ammannia	herb	OBL	5
Apocynum cannabinum	dogbane	herb	FAC	2
Asclepias incarnata	swamp milkweed	herb	OBL	4
Aster simplex	panicled aster	herb	FACW	3
Bidens aristosa	swamp marigold	herb	FACW	1
Bidens frondosa	beggar's ticks	herb	FACW	1
Boehmeria cylindrica	false nettle	herb	OBL	3
Boltonia asteroides	false aster	herb	FACW	5
Campsis radicans	trumpet creeper	herb	FAC	2
Carex hyalinolepis	sedge	herb	OBL	4
Carex tribuloides	sedge	herb	FACW+	3
Carya illinoensis	pecan	sapling	FACW	6
Cephalanthus occidentalis	buttonbush	shrub	OBL	4
Cynanchum laeve	blue vine	herb	FAC	1
Cyperus acuminatus	taperleaf flatsedge	herb	OBL	2
Cyperus strigosus	straw colored flatsedge	herb	FACW	0
Diospyros virginiana	persimmon	sapling	FAC	2
Echinochloa muricata	barnyard grass	herb	OBL	0
Eclipta prostrata	yerba de tajo	herb	FACW	2
Eleocharis erythropoda	red rooted spikerush	herb	OBL	3
Equisetum arvense	horsetail	herb	FAC	0
Fraxinus pennsylvanica	green ash	sapling	FACW	2
Heliannthus tuberosus	Jerusulem artichoke	herb	FAC	3
Hibiscus laevis	halberd leaf rose mallow	herb	OBL	4
Hibiscus lasiocarpus	hairy rose mallow	herb	FACW+	5
Leersia lenticularis	catchfly grass	herb	OBL	5
Leersia oryzoides	rice cutgrass	herb	OBL	3
Lemna minor	duckweed	herb	OBL	3
Liquidambar styraciflua	sweet gum	shrub	FACW	6
Ludwigia palustris	marsh seedbox	herb	OBL	4

**Coefficient of Conservatism, as developed by Taft, Ladd, Wilhelm and Masters (1997)

Continued on following page

ROUTINE ON-SITE WETLAND DETERMINATION
Site 2 (page 4 of 4)

Field Investigators: Plocher, Keene, Zercher **Date:** 12 October 2010
Sequence No.: **Project Name:** Cahokia Compensation Site
State: Illinois **County:** St. Clair **Applicant:** IDOT District 8
Site Name: Marsh
Legal Description: T 1 N, R 10 W, Sect.10, SE/4 NW/4
Location: southern half of tract

SPECIES LIST (continued)

Scientific name	Common name	Stratum	Wetland indicator status	C**
Lycopus americanus	water horehound	herb	OBL	3
Lycopus virginicus	bugleweed	herb	OBL	5
Lysimachia ciliata	fringed loosestrife	herb	FACW	4
Lythrum alatum	winged loosestrife	herb	OBL	5
Mimulus alatus	winged monkey flower	herb	OBL	6
Penthorum sedoides	ditch stonecrop	herb	OBL	2
Phalaris arundinacea	reed canarygrass	herb	FACW+	*
Phragmites australis	common reed	herb	FACW+	1
Phyla lanceolata	fog fruit	herb	OBL	1
Pilea pumila	clearweed	herb	FACW	3
Platanus occidentalis	sycamore	sapling	FACW	3
Polygonum amphibium	water smartweed	herb	OBL	3
Polygonum hydropiperoides	water pepper	herb	OBL	4
Polygonnum punctatum	dotted smartweed	herb	OBL	3
Populus deltoides	cottonwood	tree	FAC+	2
Rosa palustris	swamp rose	shrub	OBL	7
Rosa setigera	Illinois rose	shrub	FACU+	5
Rotala ramosier	tooth cup	herb	OBL	4
Rumex altissimus	pale dock	herb	FACW-	2
Rumex verticillatus	swamp dock	herb	OBL	5
Sagittaria latifolia	arrow head	herb	OBL	4
Salix amygdaloides	peach leaf willow	tree/sapling	FACW	4
Salix exigua	sandbar willow	sapling	OBL	1
Salix nigra	black willow	tree	OBL	3
Scutellaria lateriflora	mad dog skullcap	herb	OBL	4
Sium suave	water parsnip	herb	OBL	5
Spermacoce glabra	buttonweed	herb	FACW+	4
Spirodela polyrhiza	big duckweed	herb	OBL	5
Stachys tenuifolia	slenderleaf betony	herb	OBL	5
Toxicodendron radicans	poison ivy	herb/woody vine	FAC+	1
Typha angustifolia	narrowleaf cattail	herb	OBL	*
Typha latifolia	common cattail	herb	OBL	1
Ulmus americana	American elm	tree/shrub	FACW-	5
Vitis riparia	riverbank grape	herb/woody vine	FACW-	2

** Coefficient of Conservatism (Taft et al. 1997) $mCv = \sum C/N = 204/65 = 3.14$
* Non-native species $FQI = \sum C/\sqrt{N} = 204/\sqrt{65} = 25.3$ Quality = good
Percent nonweedy native: 15/72 = 80.36%

ROUTINE ON-SITE WETLAND DETERMINATION
Site 3 (page 1 of 3)

Field Investigators: Plocher, Keene, Zercher **Date:** 12 October 2010
Sequence No.: **Project Name:** Cahokia Compensation Site
State: Illinois **County:** St. Clair **Applicant:** IDOT District 8
Site Name: Wet Floodplain Forest
Legal Description: T 1 N, R 10 W, Sect.10, SW/4 NE/4, SE/4 NW/4
Location: southern half of tract

Do normal environmental conditions exist at this site? Yes: X No:
Has the vegetation, soil, or hydrology been significantly disturbed? Yes: No: X

VEGETATION

Dominant Plant Species	Stratum	Indicator Status
1. *Populus deltoides*	tree	FAC+
2. *Acer saccharinum*	tree	FACW
3. *Carex hyalinolepis*	herb	OBL
4. *Aster simplex*	herb	FACW
5. *Equisetum arvense*	herb	FAC

Percent of dominant species that are OBL, FACW, FAC+, or FAC: 100%

Hydrophytic vegetation: Yes: X No:
Rationale: More than 50% of dominants are OBL, FACW, FAC+, or FAC.

SOILS

Series and phase: Fluvaquent
On St. Clair County hydric soils list? Yes: No: Undet: X
Is the soil a histosol? Yes: No: X
Histic epipedon present? Yes: No: X
Redox concentrations: Yes: X No:
Redox depletions: Yes: No: X
Matrix color: N 5/ and N 6/
Other indicators: This soil is found in a low area.

Hydric soils: Yes: X No:
Rationale: This soil has iron masses and a gleyed matrix. Furthermore, this soil meets the NRCS hydric soil indicator F2 (loamy gleyed matrix). These characteristics are evidence of a hydric soil.

ROUTINE ON-SITE WETLAND DETERMINATION
Site 3 (page 2 of 3)

Field Investigators: Plocher, Keene, Zercher **Date:** 12 October 2010
Sequence No.: **Project Name:** Cahokia Compensation Site
State: Illinois **County:** St. Clair **Applicant:** IDOT District 8
Site Name: Wet Floodplain Forest
Legal Description: T 1 N, R 10 W, Sect.10, SW/4 NE/4, SE/4 NW/4
Location: southern half of tract

HYDROLOGY

Inundated: Yes: X No: Depth of standing water: 0.20 – 0.76 m (8 – 30 in)
Depth to saturated soil: 0 - 0.51 m (0 - 20 in)
Overview of hydrological flow through the system: Primary hydrologic inputs to this site are precipitation, runoff from the surrounding uplands and ditch overflow. Evapotranspiration, sheetflow and ditchflow are the major outputs.
Size of watershed: < 2.59 km^2 (< 1 mi^2)
Other field evidence observed: This site is depressional. Bare areas were observed.
Wetland hydrology: Yes: X No:
Rationale: Field evidence sited above indicates that the site is flooded or saturated for a sufficient period during the growing season to meet the criterion of wetland hydrology.

WETLAND DETERMINATION AND RATIONALE:

Is the site a wetland?: Yes: X No:
Rationale: Hydrophytic vegetation, hydric soils and wetland hydrology are all present. Therefore the site is a wetland. The site is coded by the NWI as PEMC (palustrine, emergent, seasonally flooded).

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ROUTINE ON-SITE WETLAND DETERMINATION
Site 3 (page 3 of 3)

Field Investigators: Plocher, Keene, Zercher **Date:** 12 October 2010
Sequence No.: **Project Name:** Cahokia Compensation Site
State: Illinois **County:** St. Clair **Applicant:** IDOT District 8
Site Name: Wet Floodplain Forest
Legal Description: T 1 N, R 10 W, Sect.10, SW/4 NE/4, SE/4 NW/4
Location: southern half of tract

SPECIES LIST

Scientific name	Common name	Stratum	Wetland indicator status	C**
Acer negundo	box elder	tree	FACW-	1
Acer rubrum	red maple	shrub	FAC	5
Acer saccharinum	silver maple	tree/sapl	FACW	1
Apocynum cannabinum	dogbane	herb	FAC	2
Aster simplex	panicled aster	herb	FACW	3
Boehmeria cylindrica	false nettle	herb	OBL	3
Boltonia asteroides	false aster	herb	FACW	5
Campsis radicans	trumpet creeper	herb/woody vine	FAC	2
Carex hyalinolepis	sedge	herb	OBL	4
Catalpa sp.	catalpa	tree	FACU	--
Celtis occidentalis	hackberry	shrub	FAC-	3
Cephalanthus occidentalis	buttonbush	shrub	OBL	4
Cornus drummondii	rough leaf dogwood	shrub	FAC	2
Desmanthus illinoensis	Illinois bundleflower	herb	FAC-	4
Diospyros virginiana	persimmon	tree/sapling	FAC	2
Equisetum arvense	horsetail	herb	FAC	0
Eupatorium serotinum	late flowering thoroughwort	herb	FAC+	1
Hibiscus laevis	halberd leaf rose mallow	herb	OBL	4
Liquidambar styraciflua	sweet gum	seedling	FACW	6
Lonicera maackii	Amur honeysuckle	shrub	UPL	*
Morus alba	white mulberry	tree	FAC	*
Phalaris arundinacea	reed canarygrass	herb	FACW+	*
Platanus occidentalis	sycamore	tree	FACW	3
Polygonum punctatum	dotted smartweed	herb	OBL	3
Populus deltoides	cottonwood	tree	FAC+	2
Quercus palustris	pin oak	tree/sapling	FACW	4
Rumex verticillatus	swamp dock	herb	OBL	5
Sagittaria latifolia	arrowhead	herb	OBL	4
Sallix nigra	black willow	sapling	OBL	3
Smilax hispida	bristly greenbriar	herb/woody vine	FAC	3
Spermacoce glabra	buttonweed	herb	FACW+	4
Stachys tenuifolia	slenderleaf betony	herb	OBL	5
Toxicodendron radicans	poison ivy	herb/woody vine	FAC+	1
Ulmus americana	American elm	tree/sapling	FACW-	5
Viola pratincola	common blue violet	herb	FAC	1
Vitis riparia	riverbank grape	woody vine	FACW-	2

** Coefficient of Conservatism (Taft et al. 1997)
* Non-native species
Percent weedy or nonnative: 29/36 = 80.55%

$mCv = \sum C/N = 97/32 = 3.03$
$FQI = \sum C/\sqrt{N} = 97/\sqrt{32} = 17.15$
Quality = fair

ROUTINE ON-SITE WETLAND DETERMINATION
Site 4 (page 1 of 3)

Field Investigators: Plocher, Keene, Zercher **Date:** 12 October 2010
Sequence No.: **Project Name:** Cahokia Compensation Site
State: Illinois **County:** St. Clair **Applicant:** IDOT District 8
Site Name: Young Floodplain Forest
Legal Description: T 1 N, R 10 W, Sect.10, SW/4 NE/4, SE/4 NW/4
Location: southern half of tract

Do normal environmental conditions exist at this site? Yes: X No:
Has the vegetation, soil, or hydrology been significantly disturbed? Yes: No: X

VEGETATION

Dominant Plant Species	Stratum	Indicator Status
1. *Acer negundo*	tree	FACW-
2. *Acer negundo*	sapling	FACW-
3. *Acer saccharinum*	sapling	FACW
4. *Boehmeria cylindrica*	herb	OBL
5. *Carex hyalinolepis*	herb	OBL
6. *Geum canadense*	herb	FAC

Percent of dominant species that are OBL, FACW, FAC+, or FAC: 100%

Hydrophytic vegetation: Yes: X No: X
Rationale: More than 50% of dominants are OBL, FACW, FAC+, or FAC.

SOILS
Series and phase: Fluvaquent
On St. Clair County hydric soils list? Yes: No: Undet: X
Is the soil a histosol? Yes: No: X
Histic epipedon present? Yes: No: X
Redox concentrations: Yes: X No:
Redox depletions: Yes: No: X
Matrix color: N 5/
Other indicators: This soil is found in a low area.

Hydric soils: Yes: X No:
Rationale: This soil has iron masses and a gleyed matrix. Furthermore, this soil meets the NRCS hydric soil indicator F2 (loamy gleyed matrix). These characteristics are evidence of a hydric soil.

ROUTINE ON-SITE WETLAND DETERMINATION
Site 4 (page 2 of 3)

Field Investigators: Plocher, Keene, Ketzner, Zercher **Date:** 9 Sept. 2009
Sequence No.: **Project Name:** Cahokia Compensation Site
State: Illinois **County:** St. Clair **Applicant:** IDOT District 8
Site Name: Young Floodplain Forest
Legal Description: T 1 N, R 10 W, Sect.10, SW/4 NE/4, SE/4 NW/4
Location: southern half of tract

HYDROLOGY

Inundated: Yes: No: X Depth of standing water: NA
Depth to saturated soil: 0.51 m (20 in)
Overview of hydrological flow through the system: Primary hydrologic inputs to this site are precipitation, runoff from the surrounding uplands and ditch overflow. Evapotranspiration and sheetflow are the major outputs.
Size of watershed: < 2.59 km^2 (< 1 mi^2)
Other field evidence observed: This site is depressional. Bare areas were observed.
Wetland hydrology: Yes: X No:
Rationale: Field evidence sited above indicates that the site is flooded or saturated for a sufficient period during the growing season to meet the criterion of wetland hydrology.

WETLAND DETERMINATION AND RATIONALE:

Is the site a wetland?: Yes: X No:
Rationale: Hydrophytic vegetation, hydric soils and wetland hydrology are all present. Therefore this site is a wetland. The site is coded by the NWI as PEMC (palustrine, emergent, seasonally flooded).

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ROUTINE ON-SITE WETLAND DETERMINATION
Site 4 (page 3 of 3)

Field Investigators: Plocher, Keene, Zercher **Date:** 12 October 2010
Sequence No.: **Project Name:** Cahokia Compensation Site
State: Illinois **County:** St. Clair **Applicant:** IDOT District 8
Site Name: Young Floodplain Forest
Legal Description: T 1 N, R 10 W, Sect.10, SW/4 NE/4, SE/4 NW/4
Location: southern half of tract

SPECIES LIST

Scientific name	Common name	Stratum	Wetland indicator status	C**
Acer negundo	box elder	tree/sapling	FACW-	1
Acer saccharinum	silver maple	tree/sapling	FACW	1
Alisma plamtago aquatica	water plantain	herb	OBL	2
Apocynum cannabinum	dogbane	herb	FAC	2
Boehmeria cylindrica	false nettle	herb	OBL	3
Boltonia asteroides	false aster	herb	FACW	5
Campsis radicans	trumpet creeper	herb/woody vine	FAC	2
Carex hyalinolepis	sedge	herb	OBL	4
Carex tribuloides	sedge	herb	FACW+	3
Desmanthus illinoensis	Illinois bundleflower	herb	FAC-	4
Desmodium paniculatum	tick trefoil	herb	FACU	2
Equisetum arvense	horsetail	herb	FAC	0
Fraxinus pennsylvanica	green ash	shrub	FACW	2
Geum canadense	white avens	herb	FAC	2
Liquidambar styraciflua	sweet gum	shrub	FACW	6
Lonicera maackii	Amur honeysuckle	shrub	UPL	*
Lonicera tatarica	Tartarian honeysuckle	shrub	FACU	*
Ludwigia palustris	marsh seedbox	herb	OBL	4
Lycopus americanus	water horehound	herb	OBL	3
Platanus occidentalis	sycamore	tree/sapling	FACW	3
Polygonum amphibium	water smartweed	herb	OBL	3
Polygonum punctatum	dotted smartweed	herb	OBL	3
Populus deltoides	cottonwood	sapling	FAC+	2
Rosa multiflora	multiflora rose	shrub	FACU	*
Rosa palustris	swamp rose	shrub	OBL	7
Rubus allegheniensis	blackberry	shrub	FACU+	2
Rubus flagellaris	dewberry	herb	FACU-	2
Stachys tenuifolia	slenderleaf betony	herb	OBL	5
Toxicodendron radicans	poison ivy	herb/woody vine	FAC+	1
Ulmus americana	American elm	seedling	FACW-	5
Vitis riparia	riverbank grape	herb	FACW-	2

** Coefficient of Conservatism (Taft et al. 1997)
* Non-native species
Percent weedy or nonnative: 26/31 = 83.9%

$mCv = \sum C/N = 81/28 = 2.89$
$FQI = \sum C/\sqrt{N} = 81/\sqrt{28} = 15.31$
Quality = fair

ROUTINE ON-SITE WETLAND DETERMINATION
Site 5 (page 1 of 3)

Field Investigators: Plocher, Keene, Zercher **Date:** 12 October 2010
Sequence No.: **Project Name:** Cahokia Compensation Site
State: Illinois **County:** St. Clair **Applicant:** IDOT District 8
Site Name: Wet Shrubland
Legal Description: T 1 N, R 10 W, Sect.10, SE/4 NW/4, NE/4 SW/4
Location: southern portion of tract

Do normal environmental conditions exist at this site? Yes: X No:
Has the vegetation, soil, or hydrology been significantly disturbed? Yes: No: X

VEGETATION

Dominant Plant Species	Stratum	Indicator Status
1. *Salix exigua*	sapling/shrub	OBL
2. *Acer saccharinum*	sapling/shrub	FACW
3. *Cephalanthus occidentalis*	shrub	OBL
4. *Phalarus arundinacea*	herb	FACW+
5. *Polygonum amphibium*	herb	OBL
6. *Carex hyalinolepis*	herb	OBL

Percent of dominant species that are OBL, FACW, FAC+, or FAC: 100%

Hydrophytic vegetation: Yes: X No:
Rationale: More than 50% of dominants are OBL, FACW, FAC+, or FAC.

SOILS

Series and phase: Undetermined (inundated)
On St. Clair County hydric soils list?: Yes: No: Undet: X
Is the soil a histosol? Yes: No: X
Histic epipedon present? Yes: No: X
Redox concentrations: Yes: No: Undet: X
Redox depletions: Yes: No: Undet: X
Matrix color: NA
Other hydric soil indicators: Soil is saturated and had a hydrogen sulfide odor.

Hydric soils: Yes: X No:
Rationale: This site was inundated. This soil is ponded for a long duration or a very long duration during the growing season. This characteristic is evidence of a hydric soil.

ROUTINE ON-SITE WETLAND DETERMINATION
Site 5 (page 2 of 3)

Field Investigators: Plocher, Keene, Zercher **Date:** 12 October 2010
Sequence No.: **Project Name:** Cahokia Compensation Site
State: Illinois **County:** St. Clair **Applicant:** IDOT District 8
Site Name: Wet Shrubland
Legal Description: T 1 N, R 10 W, Sect.10, SE/4 NW/4, NE/4 SW/4
Location: southern portion of tract

HYDROLOGY

Inundated: Yes: X No: Depth of standing water: 0.25 – 0.91 m (10 – 36 in)
Depth to saturated soil: at surface
Overview of hydrological flow through the system: Primary hydrologic inputs to this site are precipitation, runoff from the surrounding uplands and ditch overflow. Evapotranspiration is the major output.
Size of watershed: < 2.59 km^2 (< 1 mi^2)
Other field evidence observed: This site is depressional. Bare areas were observed.
Wetland hydrology: Yes: X No:
Rationale: Field evidence sited above indicates that the site is flooded or saturated for a sufficient period during the growing season to meet the criterion of wetland hydrology.

WETLAND DETERMINATION AND RATIONALE:

Is the site a wetland?: Yes: X No:
Rationale: Hydrophytic vegetation, hydric soils and wetland hydrology are all present. Therefore the site is a wetland. The site is coded by the NWI as PEMC (palustrine, emergent, seasonally flooded).

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ROUTINE ON-SITE WETLAND DETERMINATION
Site 5 (page 3 of 3)

Field Investigators: Plocher, Keene, Zercher **Date:** 12 October 2010
Sequence No.: **Project Name:** Cahokia Compensation Site
State: Illinois **County:** St. Clair **Applicant:** IDOT District 8
Site Name: Wet Shrubland
Legal Description: T 1 N, R 10 W, Sect.10, SE/4 NW/4, NE/4 SW/4
Location: southern portion of tract

SPECIES LIST

Scientific name	Common name	Stratum	Wetland indicator status	C**
Acer negundo	box elder	tree/sapling	FACW-	1
Acer saccharinum	silver maple	sapling	FACW	1
Aster simplex	panicled aster	herb	FACW	3
Bidens frondosa	beggar's ticks	herb	FACW	1
Boltonia asteroides	false aster	herb	FACW	5
Carex hyalinolepis	sedge	herb	OBL	4
Carya illinoensis	pecan	shrub	FACW	6
Cephalanthus occidentalis	buttonbush	shrub	OBL	4
Diospyros virginiana	persimmon	shrub	FAC	2
Elymus virginicus	Virginia wild rye	herb	FACW-	4
Fraxinus pennsylvanica	green ash	sapling	FACW	2
Forestiera acuminata	swamp privet	shrub	OBL	6
Hibiscus laevis	halberd leaf rose mallow	herb	OBL	4
Leersia oryzoides	rice cutgrass	herb	OBL	3
Liqidambar styraciflua	sweet gum	shrub	FACW	6
Lycopus americanus	water horehound	herb	OBL	3
Phalaris arundinacea	reed canarygrass	herb	FACW+	*
Polygonum amphibium	water smartweed	herb	OBL	3
Ranunculus sceleratus	cursed crowfoot	herb	OBL	3
Rubus flagellaris	dewberry	herb	FACU-	2
Rumex verticillatus	swamp dock	herb	OBL	5
Salix amygdaloides	peach leaf willow	sapling	FACW	4
Salix exigua	sandbar willow	sapling	OBL	1
Salix nigra	black willow	tree/sapling	OBL	3
Scirpus fluviatilis	river bulrush	herb	OBL	3
Sium suave	water parsnip	herb	OBL	5
Sparganium eurycarpum	bur reed	herb	OBL	5
Typha angustifolia	narrow leaf cattail	herb	OBL	*

** Coefficient of Conservatism (Taft et al. 1997)
* Non-native species
Percent nonweedy native: 5/28 = 85.7%

$mCv = \sum C/N = 89/26 = 3.42$
$FQI = \sum C/\sqrt{N} = 89/\sqrt{26} = 17.4$
Quality = fair

Cahokia Mitigation Site 2010
St. Clair County

0 400 800 Feet

0 100 200 Meters

scale 1:4800
1 inch=400 ft

Project and site boundaries

N
W E
S

11/2010