

# Wetland Monitoring Report



Project Site:

FAS 1907 (IL 127), Tamms Monitoring Site,  
Alexander County, Illinois

IDOT Sequence Number: 1026



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February 2012



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## **Project Summary**

The eighth year of field monitoring of the wetland mitigation site along FAS 1907 (IL 127), one mile north of Tamms, Illinois was conducted on 10 May, 10-11 September, and 4 October 2011. Monitoring at this mitigation site has been extended beyond the standard five-year monitoring period, in part, because of attempted and proposed hydrologic alteration to the site. Monitoring is currently performed on four sites within the project area. Site 1 is further subdivided into two parcels based on differences in vegetation and hydrology. Three sites are emergent wetland sites while Site 4 is a non-wetland buffer area (floodplain forest tree planting). The three wetland sites satisfy all performance standards; however, total area of wetland creation (3.07 ac) remains well below the required 4.325 ac. Detailed information regarding the wetland delineation sites is contained within the report. Wetland determination forms are found in Appendix A and species lists are included in Appendix B. Wetland boundaries were recorded using a Trimble Global Positioning System. The spatial data have been digitally uploaded to the Illinois Site Assessment Tracking System ([http://frostycap.isgs.uiuc.edu/idot\\_extranet](http://frostycap.isgs.uiuc.edu/idot_extranet)). Locations of determination sites were overlaid on a digital orthophoto quadrangle (DOQ) using ArcGIS; the resulting figure is included in Appendix C. Additional maps and figures are also included in Appendix C. Appendix D includes a series of photos of the wetland delineation sites.

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Date: February 15, 2012

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*Cover Photo: View of Site 3 (Emergent Pond) at Tamms Wetland Mitigation Site. Photo taken 10 May 2011.*

# Eighth Year Wetland Mitigation Site Monitoring for the Tamms Site, FAS 1907 (IL 127), Alexander County, Illinois - 2011

## **Introduction**

Wetland compensation activity has been initiated along FAS 1907 (IL 127), one mile north of Tamms, Alexander County, Illinois (Appendix C, Figure 1). The legal location of the site is NW1/4, NE1/4 and SE1/4, SE1/4, SW1/4, Section 31, T. 14 S., R. 1 W. (Mill Creek, IL Quad). This site is mitigation for wetland impacts (1.739 ac) incurred during the widening of IL 127 in Union and Alexander counties. The total mitigation required for this project is 4.325 ac.

Prior to wetland construction this mitigation site was mostly in row crops with some abandoned railroad embankment (IDOT Wetland Conceptual Plan). This site is located within the Bottomlands Section of the Coastal Plain Natural Division of Illinois. The presettlement forests of this section were primarily bottomland oak-hickory forests (*Quercus bicolor*, *Q. lyrata*, *Q. michauxii*, *Q. pagoda*, *Q. palustris*, *Q. shumardii*, *Carya laciniosa*, *C. ovata*, *C. cordiformis* as well as *Fraxinus* spp., *Liquidambar styraciflua*, *Nyssa sylvatica*, and many others) (Schwegman et al. 1973). The wetland conceptual plan for this area suggests that emergent ponds, wet meadow, and a wetland tree planting would be the most likely development for this site (IDOT Wetland Conceptual Plan).

Illinois Natural History Survey (INHS) personnel began field monitoring of this area in 2004 as requested by the Illinois Department of Transportation (IDOT) (Marlow 2003). The Illinois State Geological Survey (ISGS) was also tasked to monitor the hydrology of this site. Project goals, objectives, and performance standards are included in this report, as are monitoring methods, monitoring results, summary information and recommendations.

## **Project Goals, Objectives, and Performance Standards**

Proposed goals and objectives for this wetland mitigation project are based on information contained in the original wetland conceptual plan for this site (IDOT Wetland Conceptual Plan). Performance standards are based on those specified in the *Corps of Engineers Wetland Delineation Manual* (Environmental Laboratory 1987), *Guidelines for Developing Mitigation Proposals* (USACOE 1993), and *Assessment of Created Wetland Performance in Illinois* (Plocher and Matthews 2004). Each goal should be attained by the end of the monitoring period. Project goals, objectives and performance standards are listed below.

**Project Goal #1:** At the end of the monitoring period the created wetland communities should be jurisdictional wetlands as defined by current federal standards.

**Objective:** The created wetlands should comprise 4.325 acres of jurisdictional wetland.

**Performance Standard:** The created wetlands should satisfy the three criteria of the federal wetland definition: dominant hydrophytic vegetation, hydric soils, and wetland hydrology.

- A. Predominance of Hydrophytic Vegetation – More than 50% of the dominant plant species must be hydrophytic.
- B. Presence of Hydric Soils – Hydric soil characteristics should be present, or conditions favorable for hydric soil formation should persist at this site.
- C. Presence of Wetland Hydrology – The compensation area must be either permanently or periodically inundated at average depths less than 2 m (6.6 ft) or have soils that are saturated to the surface for at least 12.5% of the growing season.\*

**Project Goal #2:** Native, non-weedy, emergent wetland communities will be created (Sites 1-3).

**Objective:** Planting the area with high quality native emergent vegetation should reduce the pressures from early successional, non-native, weedy species (Table 1).

**Table 1. Proposed emergent species to be planted at the FAS 1907 (IL 127) Tamms wetland monitoring site.**

Quantity	Scientific Name	Common Name	Size
500	<i>Acorus calamus</i>	Sweet Flag	2" x 3" pots
500	<i>Iris shrevei</i>	Blue Flag Iris	2" x 3" pots
500	<i>Pontederia cordata</i>	Pickerelweed	2" x 3" pots
500	<i>Scirpus acutus</i>	Hardstem Bulrush	2" x 3" pots
500	<i>Sagittaria latifolia</i>	Arrowhead	2" x 3" pots

In addition to these species it appears that unknown quantities of *Juncus effusus* (common rush) and *Juncus nodatus* (stout rush) were also planted at the mitigation area.

**Performance Standards:**

- A. At least 50% of the planted emergent species should be represented by live, healthy individuals at the end of the monitoring period.
- B. At least 50% of the plant species present should be native and non-weedy species.
- C. None of the dominant plant species may be non-native.

**Project Goal #3:** A floodplain forest wetland community will be created (Site 4).

**Objective:** Planting the area with hydrophytic tree species should compensate for the loss of previously altered wetlands.

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\* In some cases wetland hydrology can be met when a site is inundated or saturated for 5% to 12.5% of the growing season (Environmental Laboratory 1987).

**Performance Standard:** 75% of the planted trees should be in a live and healthy condition each year during the monitoring period.

### **Methods**

Monitoring of this wetland mitigation site began in 2004. Monitoring has been extended beyond the standard five-year monitoring period, in part, because of attempted and proposed hydrologic alteration to the site. INHS personnel will monitor the biological and soil parameters and the ISGS will monitor hydrology. The project area has been divided into four sites based on the original wetland conceptual plan (IDOT). Site 1 is located at the north end of the mitigation area and was proposed as an emergent pond community. In 2005, it was decided that Site 1 should be divided into two parts, 1A (west side; wet meadow) and 1B (east side; emergent pond/wet meadow). Herbaceous vegetation in both parcels of Site 1 will be monitored annually using standard sampling techniques (Cox 1985). Transects placed 20 m apart have been established and herbaceous vegetation will be assessed using 1m<sup>2</sup> quadrats placed at two meter intervals along the transect, beginning with a quadrat one meter from the baseline. A minimum of forty 1m<sup>2</sup> quadrats will be sampled annually at Site 1. Likewise, Site 3 (emergent pond), located at the southeast corner of the mitigation area, will be assessed using standard sampling techniques (Cox 1985). Three transects (273°) have been established perpendicular to a baseline (3°) running along the east side of the wetland. Quadrats (1m<sup>2</sup>) will be placed at five meter intervals along each transect, beginning with a quadrat two meters from the baseline. A minimum of twenty 1m<sup>2</sup> quadrats will be sampled annually. Site 2 is a small, narrow, wet meadow site. Because of its small size, Site 2 is not quantitatively sampled. Instead the assessment of dominant herbaceous vegetation at Site 2 will be assessed by a visual estimate of species cover on the site as a whole. Dominant species for Site 4 (proposed wetland tree planting) will also be based on a visual estimate of species cover on the site as a whole.

Results and status of the created wetland sites will be submitted to the IDOT in yearly monitoring reports. The likelihood of meeting the proposed goals and performance standards will also be addressed. If, at any time during the monitoring period, it appears that the goals/performance standards will not be met at the end of the monitoring period, written management recommendations will be made to IDOT in an effort to correct any problems.

### **Floristic Quality Assessment**

Each native plant species was assigned a “coefficient of conservatism” (C) (Taft et al. 1997), a subjective rating of species fidelity to undegraded natural communities, ranging from zero to ten. Conservative species - those more likely to be found in “pristine” natural areas - were assigned high numbers, whereas non-conservative species - those that occur in anthropogenically disturbed areas - were given lower numbers. Non-native species and those not identifiable to species level were not assigned a rating. The Floristic Quality Index (FQI) is computed as  $FQI = (\text{mean } C) \times (\sqrt{N})$ , where mean C is the mean coefficient of conservatism for all native plant species at a site and N is the total number of native plant species at the site. In very general terms, higher FQI values for plant communities indicate more similarity to “pristine” natural areas, as compared to those communities with lower FQI values. Botanical nomenclature follows Taft et al. (1997).

**Project Goal #1:** At the end of the monitoring period the created wetland communities should be jurisdictional wetlands as defined by current federal standards.

- A. Predominance of Hydrophytic Vegetation – The method for determining hydrophytic vegetation is described in Environmental Laboratory (1987) and Federal Interagency Committee for Wetland Delineation (1989). This method is based on aerial coverage estimates for individual plant species. Dominant hydrophytic vegetation will be determined each year based on visual estimates of cover in the site as a whole. Each of the dominant plant species is assigned a wetland indicator status rating (Reed 1988). Any plant rated facultative or wetter (i.e. FAC, FAC+, FACW-, FACW, FACW+, or OBL) is considered hydrophytic. A predominance of hydrophytic vegetation in the wetland plant community exists if greater than 50% of the dominant species present are hydrophytic.

Dominant hydrophytic vegetation will be determined each year based on the results of systematic plant sampling (Sites 1 and 3) or by visual estimates (Sites 2 and 4). For systematic plant sampling, cover of all species in each plot is assigned a cover class according to Daubenmire (1959) as modified by Bailey and Poulton (1968) (Table 2). Frequency (proportion of quadrats in which a species occurred) and average cover (calculated using midpoints for each cover class) will be used to compute relative frequency (frequency of a species relative to total observations) and relative cover (cover relative to total observed cover), respectively. These two relative values are averaged to determine the importance value for each species sampled. Importance values will be used to determine dominant species. “Dominant species are the most abundant plant species (when ranked in descending order of abundance and cumulatively totaled) that immediately exceed 50% of the total dominance measure for the stratum, plus any additional species comprising 20% or more of the total dominance measure for the stratum”, the 50/20 Rule (FICWD 1989; Tiner 1999).

**Table 2. Cover classes, percentage range, and midpoint used in quantitative vegetation sampling at the FAS 1907 (IL 127) Tamms wetland monitoring site.**

Cover Class	Range of Cover (%)	Midpoint of Range (%)
1	0-1	0.5
2	1-5	3.0
3	5-25	15.0
4	25-50	37.5
5	50-75	62.5
6	75-95	85.0
7	95-100	97.5

(Daubenmire 1959; Bailey and Poulton 1968)

- B. Presence of Hydric Soils – INHS personnel will examine soil cores for field indicators to determine the presence or absence of hydric soils as described in the *Corps of Engineers*

*Wetland Delineation Manual* (Environmental Laboratory 1987) and the *Field Indicators of Hydric Soils in the United States* (USDA 2002).

Hydric soils may develop slowly and characteristics may not be apparent during the first several years after project construction. In the absence of hydric soil indicators at that time, hydrologic data could be used as corroborative evidence that conditions favorable for hydric soil formation are present at the site.

- C. Presence of Wetland Hydrology – The extent of wetland hydrology at this site is monitored by the ISGS. The following is summarized from Pociask and Monson (2011) and Miner et al. (2011). Wetland hydrology occurs when inundation or saturation to land surface is present for greater than 5% of the growing season (11 days at this site) where the soils and vegetation parameters in the *Corps of Engineers Wetland Delineation Manual* also are met; if either is lacking, then inundation or saturation must be present for greater than 12.5% of the growing season (28 days at this site) to satisfy the wetland hydrology criteria (Environmental Laboratory 1987) (<http://el.erdc.usace.army.mil/wetlands/pdfs/wlman87.pdf>). Inundation and saturation at the site are monitored using a combination of nine monitoring wells, four staff gauges, and a rain gauge. Water levels are ordinarily measured biweekly from March to May, and monthly during the remainder of the year. Manual readings are supplemented by two dataloggers, which measure surface-water levels at regular intervals to document all hydrologic events. Additional details regarding site conditions and monitoring results for wetland hydrology will be included in annual reports from the ISGS. In addition, INHS scientists will survey the site annually for field indicators of wetland hydrology.

**Project Goal #2:** Native, non-weedy, emergent wetland communities will be created (Sites 1-3).

Performance Standard A

Planted emergent species survivorship will be assessed each year beginning in 2004. Initially, seven emergent species were planted. These emergent species were: *Acorus calamus*, *Iris shrevei*, *Juncus effusus*, *J. nodatus*, *Pontederia cordata*, *Sagittaria latifolia*, and *Scirpus acutus*. Annually, planted emergent species will be located, identified to species, and determined to be alive or dead. If less than 50% of the planted emergent species are represented by live, healthy individuals at the end of the five-year monitoring period, this part of the performance criteria for project goal #2 will be considered unsatisfied.

Performance Standard B

A complete species list will be compiled each year and species will be recorded as native or non-native and weedy or non-weedy. Nativity of plant species will be determined by consulting Mohlenbrock (1986; 2002) and Taft et al. (1997). Weedy species, for the purposes of this report, are defined as all non-native species and any native species assigned a Coefficient of Conservatism (C) of 0 or 1 (Taft et al. 1997). Species given a C value of 0-1 correspond to Grime's ruderal species (Grime 1974; Grime et al. 1988) or species which are adapted to frequent or severe disturbances (Taft et al. 1997). If native and non-weedy species constitute

less than 50% of the plant species present at a particular site, performance standard B for project goal #2 will be considered unsatisfied for that site.

### Performance Standard C

Dominant plant species will be determined for all wetland delineation sites within the monitoring area. If any dominant species are non-native, performance standard C for project goal #2 will be considered unsatisfied.

**Project Goal #3:** A floodplain forest wetland community will be created (Site 4).

Tree survivorship will be assessed each year beginning in 2004. Initially, 201 tree saplings were planted at the Tamms Monitoring Site. Most (187) were planted within Site 4 or at the perimeter of Sites 2 and 3. These trees included: 17 *Fraxinus pennsylvanica* (green ash), 17 *Liquidambar styraciflua* (sweet or red gum), 17 *Platanus occidentalis* (sycamore), 38 *Quercus bicolor* (swamp white oak), 38 *Q. lyrata* (overcup oak), 39 *Q. palustris* (pin oak), and 21 *Taxodium distichum* (bald cypress). An additional fourteen *Taxodium distichum* ( $\Sigma=35$ ) were planted at the north end of the mitigation area (around Site 1). Annually, every tree will be located, identified to species, and determined to be alive or dead. If less than 150 (75%) of the planted trees are found to be alive the performance standard for project goal #3 will be considered unsatisfied. In 2010, an additional 200 tree seedlings (50 sweet gum, 50 swamp white oak, 50 overcup oak, and 50 bald cypress) were planted to compensate for past mortality. In 2011, an additional 400 small tree seedlings/saplings were planted (100 bald cypress, 100 sweet gum, 100 swamp white oak, and 100 overcup oak).

## **Results and Discussion**

### Floristic Quality Assessment

The FQI was calculated for each wetland delineation site using native species only. Site 1A had a mean C value of 3.3 and a FQI score of 32.5. Likewise, Site 1B (mean C = 3.4, FQI = 31.8), Site 2 (mean C = 3.4, FQI = 27.8), and Site 3 (mean C = 3.1, FQI = 29.5) also had values characteristic of good natural quality. Site 4 also had a high FQI (24.2), indicating good natural quality; however, the mean C value was only 2.6. This disparity between the high FQI and fair mean C value may reflect that FQI is influenced by this site's large size. Summary information for wetland delineation sites at FAS 1907 (IL 127) Tamms wetland monitoring site is given in Table 3.

In 2011, numerous conservative species indicative of higher natural quality were present. Twenty-five species were present with a C value of 6 or greater (Taft et al. 1997). These species were: *Carex caroliniana*, short-scaled green sedge (Sites 1B, 2, 3, 4), *C. crinita*, fringed sedge (Sites 1A, 2), *C. festucacea*, fescue oval sedge (Sites 1A, 1B, 2, 4), *C. lurida*, bottlebrush sedge (Site 2), *C. muskingumensis*, swamp oval sedge (Site 1B), *Cocculus carolinus*, snailseed (Site 4), *Eleocharis verrucosa*, slender spikerush (Sites 1A, 1B, 2, 3), *Galium tinctorium*, stiff bedstraw (Sites 1B, 3), *Ilex decidua*, swamp holly (Site 1B), *Juncus diffusissimus*, slimpod rush (Site 2), *Juncus nodatus*, stout rush (Sites 1A, 1B, 2, 3), *Liquidambar styraciflua*, sweet gum (Sites 1A, 1B,

4), *Ludwigia glandulosa*, false loosestrife (Sites 1A, 2, 3), *Mimulus alatus*, winged monkey flower (Site 1A), *Nyssa sylvatica*, black gum (Site 1B), *Panicum rigidulum*, munro grass (Sites 1A, 1B), *Pluchea camphorata*, camphor weed (Site 3), *Pontederia cordata*, pickerel weed (Sites 1A, 3), *Populus heterophylla*, swamp cottonwood (Site 3), *Quercus bicolor*, swamp white oak (Sites 1B, 2, 3, 4), *Q. lyrata*, overcup oak (Sites 3, 4), *Q. marilandica*, blackjack oak (Site 4), *Ranunculus laxicaulis*, spearwort (Sites 1A, 3), *Smilax glauca*, green briar (Site 4), *Taxodium distichum*, bald cypress (Sites 1A, 1B, 2, 3, 4), and *Verbesina helianthoides*, yellow crownbeard (Site 4).

Furthermore, the Illinois endangered *Glyceria arkansana* (Arkansas manna-grass) has been observed in past years within Site 1B (Herkert and Ebinger 2002; Illinois Endangered Species Protection Board 2005). A voucher collection is deposited at the Illinois Natural History Survey Herbarium (ILLS) (Marcum #4623.1 collected May 30, 2007). This species was present at this site from 2007 to 2009 (Marcum et al. 2008; Marcum et al. 2009; Marcum et al. 2010). This species was not seen in 2010 or 2011 (Marcum et al. 2011).

**Table 3. Summary table for wetland delineation sites at FAS 1907 (IL 127) Tamms wetland monitoring site, 2011 (directional arrows to the right of values indicate change since the previous year).**

	Site 1A	Site 1B	Site 2	Site 3	Site 4
Total Species Richness	109↓	95↓	83↑	109↓	126↑
Native Species Richness	96↓	87↑	68↑	90↓	88↑
% Native	88%↔	92%↑	82%↑	83%↑	70%↓
% Native and Non-weedy	71%↑	76%↑	63%↑	59%↓	45%↔
Mean Conservatism (mean C)	3.3↑	3.4↑	3.4↑	3.1↓	2.6↑
Floristic Quality Index (FQI)	32.5↑	31.8↑	27.8↑	29.5↓	24.2↑
% Wetland Species (FAC to OBL)	84%↑	84%↑	82%↑	72%↓	46%↓

**Project Goal #1:** At the end of the five-year monitoring period the created wetland communities should be jurisdictional wetlands as defined by current federal standards.

- A. Predominance of Hydrophytic Vegetation – The performance standard requires that greater than 50% of the dominant plant species be hydrophytic. Dominant plant species for 2011 are given in Tables 4 through 8. Quantitative sampling results for Sites 1A, 1B, and 3 are presented in Tables 9 to 11. More than 50% of the dominant species are hydrophytes for all sites, except Site 4 (Shrubland [proposed floodplain forest]).

**Table 4. Dominant species present at FAS 1907 (IL 127) Site 1A, wet meadow (directional arrows to the right of the importance values indicate change since the previous year).**

Dominant Plant Species	Indicator Status	Stratum	Importance Value (IV)
1. <i>Carex tribuloides</i>	FACW+	herb	16.0702↑
2. <i>Echinochloa muricata</i>	OBL	herb	12.7531↑
3. <i>Aster vimineus</i>	FACW-	herb	10.7663↓
4. <i>Aster ontarionis</i>	FAC	herb	5.0305↓
5. <i>Scirpus atrovirens</i>	OBL	herb	4.2971↑
6. <i>Ludwigia palustris</i>	OBL	herb	3.5596↑

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

**Table 5. Dominant species present at FAS 1907 (IL 127) Site 1B, emergent pond/wet meadow (directional arrows to the right of the importance values indicate change since the previous year).**

Dominant Plant Species	Indicator Status	Stratum	Importance Value (IV)
1. <i>Boltonia asteroides</i>	FACW	herb	23.3818↓
2. <i>Aster vimineus</i>	FACW-	herb	13.7833↑
3. <i>Echinochloa muricata</i>	OBL	herb	9.5797↓
4. <i>Aster ontarionis</i>	FAC	herb	6.0080↓

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

**Table 6. Dominant species present at FAS 1907 (IL 127) Site 2, wet meadow.**

Dominant Plant Species	Indicator Status	Stratum
1. <i>Aster vimineus</i>	FACW-	herb
2. <i>Juncus nodatus</i>	OBL	herb

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

**Table 7. Dominant species present at FAS 1907 (IL 127) Site 3, emergent pond (directional arrows to the right of the importance values indicate change since the previous year).**

Dominant Plant Species	Indicator Status	Stratum	Importance Value (IV)
1. <i>Aster vimineus</i>	FACW-	herb	15.5246↑
2. <i>Boltonia asteroides</i>	FACW	herb	15.3535↑
3. <i>Juncus nodatus</i>	OBL	herb	12.4570↓
4. <i>Diodia virginiana</i>	FACW	herb	7.3833↑

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

**Table 8. Dominant species present at FAS 1907 (IL 127) Site 4, shrubland (proposed floodplain forest).**

Dominant Plant Species	Indicator Status	Stratum
1. <i>Quercus bicolor</i>	planted	sapling/shrub
2. <i>Quercus lyrata</i>	planted	sapling/shrub
3. <i>Quercus palustris</i>	planted	sapling/shrub
4. <i>Campsis radicans</i>	FAC	herb
5. <i>Lespedeza cuneata</i>	NI (FACU/UPL)*	herb
6. <i>Poa pratensis</i>	FAC-	herb
7. <i>Solidago canadensis</i>	FACU	herb

Percentage of dominant species that are OBL, FACW, FAC+, or FAC: 25%

\**Lespedeza cuneata* doesn't have an indicator rating for the North Central Region in Reed (1988); however, it was given a rating of UPL by the 1996 revision of the National Wetland Plant List (Reed 1997). Likewise, the current revision of the National Wetland Plant List shows a Draft Final wetland indicator rating of FACU for the Atlantic and Gulf Coastal Plain Region and UPL for the Northcentral and Northeast Region (Lichvar and Kartesz 2009, [http://wetland\\_plants.usace.army.mil](http://wetland_plants.usace.army.mil)).

**Table 9. FAS 1907 (IL 127) Site 1A wetland monitoring site vegetation sampling data including frequency, cover, and importance value for all species sampled in 2011. Dominant species are in bold.**

Species	Indicator	Average Cover	Relative Cover	Frequency	Relative Frequency	Importance Value (IV)
<b><i>Carex tribuloides</i></b>	FACW+	<b>17.1364</b>	<b>20.2199</b>	<b>0.8182</b>	<b>11.9205</b>	<b>16.0702</b>
<b><i>Echinochloa muricata</i></b>	OBL	<b>12.6364</b>	<b>14.9102</b>	<b>0.7273</b>	<b>10.5960</b>	<b>12.7531</b>
<b><i>Aster vimineus</i></b>	FACW-	<b>12.6364</b>	<b>14.9102</b>	<b>0.4545</b>	<b>6.6225</b>	<b>10.7663</b>
<b><i>Aster ontarionis</i></b>	FAC	<b>5.1591</b>	<b>6.0874</b>	<b>0.2727</b>	<b>3.9735</b>	<b>5.0305</b>
<b><i>Scirpus atrovirens</i></b>	OBL	<b>4.4773</b>	<b>5.2829</b>	<b>0.2273</b>	<b>3.3113</b>	<b>4.2971</b>
<b><i>Ludwigia palustris</i></b>	OBL	<b>3.2273</b>	<b>3.8080</b>	<b>0.2273</b>	<b>3.3113</b>	<b>3.5596</b>
<i>Aster simplex</i>	FACW	3.7500	4.4248	0.1818	2.6490	3.5369
<i>Polygonum hydropiperoides</i>	OBL	0.7727	0.9118	0.4091	5.9603	3.4360
<i>Campsis radicans</i>	FAC	2.4545	2.8962	0.2727	3.9735	3.4349
<i>Juncus effusus</i>	OBL	3.5455	4.1834	0.1364	1.9868	3.0851
<i>Juncus nodatus</i>	OBL	3.5455	4.1834	0.1364	1.9868	3.0851
<i>Boltonia asteroides</i>	FACW	2.3182	2.7353	0.2273	3.3113	3.0233
<i>Carex vulpinoidea</i>	OBL	1.3636	1.6090	0.2727	3.9735	2.7913
<i>Eleocharis obtusa</i>	OBL	1.0909	1.2872	0.1818	2.6490	1.9681
<i>Leersia oryzoides</i>	OBL	1.7273	2.0381	0.0909	1.3245	1.6813
<i>Ulmus americana</i>	FACW-	0.5455	0.6436	0.1818	2.6490	1.6463
<i>Apios americana</i>	FACW	1.7045	2.0113	0.0455	0.6623	1.3368
<i>Andropogon virginicus</i>	FAC-	0.2955	0.3486	0.1364	1.9868	1.1677
<i>Cyperus esculentus</i>	FACW	0.8182	0.9654	0.0909	1.3245	1.1450
<i>Ulmus alata</i>	FACU	0.8182	0.9654	0.0909	1.3245	1.1450
<i>Carex hyalinolepis</i>	OBL	0.8182	0.9654	0.0909	1.3245	1.1450
<i>Polygonum punctatum</i>	OBL	0.1818	0.2145	0.1364	1.9868	1.1006
<i>Solanum carolinense</i>	FACU-	0.1818	0.2145	0.1364	1.9868	1.1006
<i>Panicum implicatum</i>	FAC	0.0682	0.0805	0.1364	1.9868	1.0336
<i>Ludwigia polycarpa</i>	OBL	0.2727	0.3218	0.0909	1.3245	0.8232
<i>Quercus palustris</i>	FACW	0.6818	0.8045	0.0455	0.6623	0.7334
<i>Teucrium canadense</i>	FACW-	0.6818	0.8045	0.0455	0.6623	0.7334
<i>Chasmanthium latifolium</i>	FACW	0.6818	0.8045	0.0455	0.6623	0.7334
<i>Parthenocissus quinquefolia</i>	FAC-	0.0455	0.0536	0.0909	1.3245	0.6891
<i>Acalypha rhomboidea</i>	FACU	0.0455	0.0536	0.0909	1.3245	0.6891
<i>Ambrosia artemisiifolia</i>	FACU	0.0455	0.0536	0.0909	1.3245	0.6891
<i>Vitis cinerea</i>	FACW-	0.1364	0.1609	0.0455	0.6623	0.4116
<i>Carex squarrosa</i>	OBL	0.1364	0.1609	0.0455	0.6623	0.4116
<i>Solidago canadensis</i>	FACU	0.1364	0.1609	0.0455	0.6623	0.4116
<i>Xanthium strumarium</i>	FAC	0.1364	0.1609	0.0455	0.6623	0.4116
<i>Eleocharis acicularis</i>	OBL	0.1364	0.1609	0.0455	0.6623	0.4116
<i>Panicum rigidulum</i>	FACW	0.1364	0.1609	0.0455	0.6623	0.4116
Others (9 taxa)		0.2045	0.2414	0.4091	5.9603	3.1008
		84.7500	100.0000	6.8636	100.0000	100.0000
Bare Ground		6.1591				
Litter		13.0000				

**Table 10. FAS 1907 (IL 127) Site 1B wetland monitoring site vegetation sampling data including frequency, cover, and importance value for all species sampled in 2011. Dominant species are in bold.**

Species	Indicator	Average Cover	Relative Cover	Frequency	Relative Frequency	Importance Value (IV)
<b><i>Boltonia asteroides</i></b>	FACW	<b>31.2587</b>	<b>34.5088</b>	<b>0.8065</b>	<b>12.2549</b>	<b>23.3818</b>
<b><i>Aster vimineus</i></b>	FACW-	<b>15.6458</b>	<b>17.2725</b>	<b>0.6774</b>	<b>10.2941</b>	<b>13.7833</b>
<b><i>Echinochloa muricata</i></b>	OBL	<b>9.8065</b>	<b>10.8261</b>	<b>0.5484</b>	<b>8.3333</b>	<b>9.5797</b>
<b><i>Aster ontarionis</i></b>	FAC	<b>6.0000</b>	<b>6.6238</b>	<b>0.3548</b>	<b>5.3922</b>	<b>6.0080</b>
<i>Panicum rigidulum</i>	FACW	7.0323	7.7634	0.1935	2.9412	5.3523
<i>Aster simplex</i>	FACW	4.5000	4.9679	0.3548	5.3922	5.1800
<i>Polygonum hydropiperoides</i>	OBL	0.7581	0.8369	0.5484	8.3333	4.5851
<i>Ludwigia palustris</i>	OBL	2.2258	2.4572	0.3871	5.8824	4.1698
<i>Eleocharis obtusa</i>	OBL	2.2097	2.4394	0.2903	4.4118	3.4256
<i>Carex tribuloides</i>	FACW+	1.9516	2.1545	0.2903	4.4118	3.2831
<i>Diodia virginiana</i>	FACW	1.5645	1.7272	0.2581	3.9216	2.8244
<i>Acorus calamus</i>	OBL	2.5161	2.7777	0.0968	1.4706	2.1242
<i>Carex vulpinoidea</i>	OBL	0.4032	0.4452	0.1613	2.4510	1.4481
<i>Campsis radicans</i>	FAC	0.6129	0.6766	0.1290	1.9608	1.3187
<i>Carex hyalinolepis</i>	OBL	1.3065	1.4423	0.0645	0.9804	1.2113
<i>Eleocharis acicularis</i>	OBL	0.0645	0.0712	0.1290	1.9608	1.0160
<i>Panicum dichotomiflorum</i>	FACW-	1.2097	1.3355	0.0323	0.4902	0.9128
<i>Penthorum sedoides</i>	OBL	0.1290	0.1424	0.0968	1.4706	0.8065
<i>Setaria faberi</i>	FACU+	0.1290	0.1424	0.0968	1.4706	0.8065
<i>Lespedeza cuneata</i>	NI	0.0484	0.0534	0.0968	1.4706	0.7620
<i>Lindernia dubia</i>	OBL	0.0484	0.0534	0.0968	1.4706	0.7620
<i>Liquidambar styraciflua</i>	FACW	0.1129	0.1246	0.0645	0.9804	0.5525
<i>Ambrosia artemisiifolia</i>	FACU	0.1129	0.1246	0.0645	0.9804	0.5525
<i>Rotala ramosior</i>	OBL	0.1129	0.1246	0.0645	0.9804	0.5525
<i>Rorippa islandica</i>	OBL	0.0323	0.0356	0.0645	0.9804	0.5080
<i>Cyperus strigosus</i>	FACW	0.0323	0.0356	0.0645	0.9804	0.5080
<i>Celtis occidentalis</i>	FAC-	0.0323	0.0356	0.0645	0.9804	0.5080
<i>Acer negundo</i>	FACW-	0.0968	0.1068	0.0323	0.4902	0.2985
<i>Teucrium canadense</i>	FACW-	0.0968	0.1068	0.0323	0.4902	0.2985
<i>Eleocharis verrucosa</i>	OBL	0.0968	0.1068	0.0323	0.4902	0.2985
<i>Eclipta prostrata</i>	FACW	0.0968	0.1068	0.0323	0.4902	0.2985
<i>Salix nigra</i>	OBL	0.0968	0.1068	0.0323	0.4902	0.2985
<i>Populus deltoides</i>	FAC+	0.0968	0.1068	0.0323	0.4902	0.2985
<i>Sida spinosa</i>	FACU	0.0161	0.0178	0.0323	0.4902	0.2540
<i>Acalypha rhomboidea</i>	FACU	0.0161	0.0178	0.0323	0.4902	0.2540
<i>Iva annua</i>	FAC	0.0161	0.0178	0.0323	0.4902	0.2540
<i>Nyssa sylvatica</i>	UPL	0.0161	0.0178	0.0323	0.4902	0.2540
<i>Agrostis hyemalis</i>	FAC-	0.0161	0.0178	0.0323	0.4902	0.2540
<i>Juncus effusus</i>	OBL	0.0161	0.0178	0.0323	0.4902	0.2540
<i>Xanthium strumarium</i>	FAC	0.0161	0.0178	0.0323	0.4902	0.2540
<i>Acalypha virginica</i>	FACU	0.0161	0.0178	0.0323	0.4902	0.2540
<i>Ammannia coccinea</i>	OBL	0.0161	0.0178	0.0323	0.4902	0.2540
		90.5819	100.0000	6.5806	100.0000	100.0000
Bare Ground		12.0645				
Litter		21.2419				

**Table 11. FAS 1907 (IL 127) Site 3 wetland monitoring site vegetation sampling data including frequency, cover, and importance value for all species sampled in 2011. Dominant species are in bold.**

Species	Indicator	Average Cover	Relative Cover	Frequency	Relative Frequency	Importance Value (IV)
<b><i>Aster vimineus</i></b>	FACW-	<b>25.4038</b>	<b>25.1955</b>	<b>0.4615</b>	<b>5.8537</b>	<b>15.5246</b>
<b><i>Boltonia asteroides</i></b>	FACW	<b>18.1731</b>	<b>18.0240</b>	<b>1.0000</b>	<b>12.6829</b>	<b>15.3535</b>
<b><i>Juncus nodatus</i></b>	OBL	<b>13.8077</b>	<b>13.6944</b>	<b>0.8846</b>	<b>11.2195</b>	<b>12.4570</b>
<b><i>Diodia virginiana</i></b>	FACW	<b>7.0192</b>	<b>6.9617</b>	<b>0.6154</b>	<b>7.8049</b>	<b>7.3833</b>
<i>Ludwigia palustris</i>	OBL	7.2885	7.2287	0.3846	4.8780	6.0534
<i>Acorus calamus</i>	OBL	6.6731	6.6183	0.4231	5.3659	5.9921
<i>Aster simplex</i>	FACW	4.0192	3.9863	0.5000	6.3415	5.1639
<i>Phyla lanceolata</i>	OBL	5.6346	5.5884	0.3077	3.9024	4.7454
<i>Pontederia cordata</i>	OBL	5.2308	5.1879	0.2308	2.9268	4.0573
<i>Polygonum hydropiperoides</i>	OBL	0.7115	0.7057	0.4615	5.8537	3.2797
<i>Cyperus pseudovegetus</i>	FACW	1.1731	1.1635	0.2692	3.4146	2.2890
<i>Xanthium strumarium</i>	FAC	1.3269	1.3160	0.2308	2.9268	2.1214
<i>Iva annua</i>	FAC	0.7692	0.7629	0.2308	2.9268	1.8449
<i>Aster ontarionis</i>	FAC	0.8269	0.8201	0.1538	1.9512	1.3857
<i>Carex vulpinoidea</i>	OBL	0.0769	0.0763	0.1538	1.9512	1.0138
<i>Scirpus atrovirens</i>	OBL	0.6923	0.6866	0.0769	0.9756	0.8311
<i>Galium tinctorium</i>	OBL	0.1538	0.1526	0.1154	1.4634	0.8080
<i>Sida spinosa</i>	FACU	0.0577	0.0572	0.1154	1.4634	0.7603
<i>Ludwigia glandulosa</i>	OBL	0.0577	0.0572	0.1154	1.4634	0.7603
<i>Typha latifolia</i>	OBL	0.2308	0.2289	0.0769	0.9756	0.6022
<i>Ammannia coccinea</i>	OBL	0.2308	0.2289	0.0769	0.9756	0.6022
<i>Cyperus esculentus</i>	FACW	0.0385	0.0381	0.0769	0.9756	0.5069
<i>Aster praeltus</i>	OBL	0.0385	0.0381	0.0769	0.9756	0.5069
<i>Carex tribuloides</i>	FACW+	0.0385	0.0381	0.0769	0.9756	0.5069
<i>Ludwigia peploides</i>	OBL	0.0385	0.0381	0.0769	0.9756	0.5069
<i>Juncus effusus</i>	OBL	0.1154	0.1144	0.0385	0.4878	0.3011
<i>Solanum carolinense</i>	FACU-	0.1154	0.1144	0.0385	0.4878	0.3011
<i>Ulmus americana</i>	FACW-	0.1154	0.1144	0.0385	0.4878	0.3011
<i>Solidago canadensis</i>	FACU	0.1154	0.1144	0.0385	0.4878	0.3011
<i>Lespedeza cuneata</i>	NI	0.1154	0.1144	0.0385	0.4878	0.3011
<i>Taxodium distichum</i>	OBL	0.1154	0.1144	0.0385	0.4878	0.3011
<i>Pluchea camphorata</i>	FACW	0.1154	0.1144	0.0385	0.4878	0.3011
<i>Typha angustifolia</i>	OBL	0.1154	0.1144	0.0385	0.4878	0.3011
Others (10 taxa)		0.1923	0.1907	0.3846	4.8780	2.5344
		100.8269	100.0000	7.8846	100.0000	100.0000
Bare Ground		25.4231				
Litter		8.3269				

- B. Presence of Hydric Soils – The performance standard requires that hydric soil characteristics be present, or conditions favorable for hydric soil formation should persist. INHS personnel examined soil cores for field indicators to determine the presence or absence of hydric soils as described in the *Corps of Engineers Wetland Delineation Manual* (Environmental Laboratory 1987) and the *Field Indicators of Hydric Soils in the United States* (USDA 2002). The Natural Resource Conservation Service (NRCS) had mapped the entire site as hydric

soils (Parks and Fehrenbacher 1968). After conducting a field investigation, the first three sites that received some excavation appeared to be hydric. The fourth site, which is not considered part of the wetland acreage, but as a buffer, is predominately non-hydric. Hydric soil areas seem to have expanded between Sites 2 and 3. The following tables (Table 12-16) provide soil descriptions of a typical pedon for each site.

**Table 12. Site 1A (Wet Meadow) – Okaw silt loam.**

<u>Hor- izon</u>	<u>Depth (in)</u>	<u>Matrix Color</u>	<u>Concre- -tions</u>	<u>Iron Masses</u>	<u>Pore linings</u>	<u>Iron Deplet.</u>	<u>Clay Deplet.</u>	<u>Tex- -ture</u>	<u>Struc- -ture</u>
	0-3	10YR 5/2, N 5/		FFD 10YR 5/4				sil	gr
	3-14	2.5Y 6/1 2.5Y 6/2		MCP 7.5YR 5/8				sicl	pl
	14-23	2.5Y 6/2		CMP 7.5YR 5/8 CMP 10YR 5/6				sicl	pr
	23-34	2.5Y 6/2		MCP 7.5YR 5/8 PMP 10YR 5/6				sicl	pr

**Table 13. Site 1B (Emergent Pond/Wet Meadow) – Okaw silt loam.**

<u>Hor- izon</u>	<u>Depth (in)</u>	<u>Matrix Color</u>	<u>Concre- -tions</u>	<u>Iron Masses</u>	<u>Pore linings</u>	<u>Iron Deplet.</u>	<u>Clay Deplet.</u>	<u>Tex- -ture</u>	<u>Struc- -ture</u>
	0-3	2.5Y 5/1 5Y 6/1 and 7/1 10YR 5/2		CMP 7.5YR 5/8 CMP 7.5YR 5/6	CM 7.5YR 5/8			sicl	gr
	3-6	2.5Y 5/1 2.5Y 6/1		CMP 7.5YR 5/6 FFP 7.5YR 5/8	CM 7.5YR 5/8			sicl	bl
	6-28	2.5Y 6/2 2.5Y 6/1		FCD 7.5YR 4/6	FM 7.5YR 5/3			sic	pr
	28-38	2.5Y 6/2		MMP 10YR 5/4	FM 7.5YR 5/3			sic	pr

**Table 14. Site 2 (Wet Meadow) – Cape silty clay loam.**

<u>Hor- izon</u>	<u>Depth (in)</u>	<u>Matrix Color</u>	<u>Concre -tions</u>	<u>Iron Masses</u>	<u>Pore linings</u>	<u>Iron Deplet.</u>	<u>Clay Deplet.</u>	<u>Tex- ture</u>	<u>Structure</u>
	0-2	2.5Y 6/2		FMP 10YR 5/6 and 5/8				sicl	bl
	2-9	2.5Y 6/2 2.5Y 6/1 5Y 7/1		FMP 10YR 5/6 FMP 7.5YR 5/8				sic	pr
	9-20	2.5Y 5/2		FFP 10YR 5/6 CMP 7.5YR 5/8				sic	pr
	20-	2.5Y 6/2		MMP 10YR 5/6 FFP 7.5YR 5/8				sic	pr

**Table 15. Site 3 (Emergent Pond) – Cape silty clay loam.**

<u>Hor- izon</u>	<u>Depth (in)</u>	<u>Matrix Color</u>	<u>Concre -tions</u>	<u>Iron Masses</u>	<u>Pore linings</u>	<u>Iron Deplet.</u>	<u>Clay Deplet.</u>	<u>Tex- ture</u>	<u>Structure</u>
	0-6	2/5Y 5/1 10Y 2.5/	10YR 3/1	CMP 7.5YR 5/8				sil	gr
	6-15	2.5Y 6/2	10YR 3/1	FMP 7.5YR 5/4 CMP 7.5YR 5/8	7.5YR 5/8			sicl	bl
	15-22	2.5Y 6/2	10YR 3/1	FMD 10YR 5/4 FMP 7.5YR 5/8	7.5YR 5/8			sic	pr
	22-36	2.5Y 6/2		MCD 10YR 5/4 FMP 7.5YR 5/8				sic	pr

**Table 16. Site 4 (Shrubland – proposed floodplain forest) – Non hydric**

<u>Hor- izon</u>	<u>Depth (in)</u>	<u>Matrix Color</u>	<u>Concre -tions</u>	<u>Iron Masses</u>	<u>Pore linings</u>	<u>Iron Deplet.</u>	<u>Clay Deplet.</u>	<u>Tex- ture</u>	<u>Structure</u>
	0-4	10YR 4/2	CM 10YR 2/1	FFD 10YR 5/4				sil	gr
	4-9	10YR 4/3	FM 10YR 2/1	CMP 10YR 5/8				sic	pl
	9-21	2.5Y 5/3 2.5Y 6/2 2.5Y 6/3 10YR 5/4	FM 10YR 2/1	FMP 7.5YR 5/8 FFD 10YR 5/4				sic	pr
	21-36	2.5Y 5/3 2.5Y 6/2 10YR 6/2	CM 10YR 2/1	MCP 7.5YR 4/6 FMP 7.5YR 5/8				sic	pr

C. Presence of Wetland Hydrology – The performance standard requires that the compensation area must be either permanently or periodically inundated at average depths less than 2 m (6.6 ft) or have soils that are saturated to the surface for at least 12.5% of the growing season\*.

\* In some cases wetland hydrology can be met when a site is inundated or saturated for 5% to 12.5% of the growing season (Environmental Laboratory 1987).

The ISGS initiated water level monitoring at this site in November 2003. The area exhibiting wetland hydrology has fluctuated annually; however, the actual delineated wetland area seems to be somewhere between the area ISGS found satisfying the wetland hydrology criterion for 5% of the growing season and the area satisfying the wetland hydrology criterion for 12.5% of the growing season. Detailed results of annual hydrology monitoring is available in the ISGS Annual Reports, 2004 to 2011 (Pociask and Shofner 2004; Pociask and Shofner 2005; Pociask 2006; Pociask 2007; Pociask 2008; Pociask 2009; Pociask and Campbell 2010; Pociask and Monson 2011).

Their findings for 2011 indicate that 7.8 ac out of a total site area of approximately 15.6 ac satisfied the wetland hydrology criterion for greater than 5% of the growing season while only 5.6 ac conclusively satisfied the wetland hydrology criterion for 12.5% of the growing season (Pociask and Monson 2011; Miner et al. 2011); Appendix C, Figure 2. Annual precipitation, September 2010 to August 2011, was 126% of normal during the 2011 monitoring period and Spring 2011 precipitation, March to May, was 220% of normal (Pociask and Monson 2011; Miner et al. 2011).

It is important to note that the area exhibiting wetland hydrology is different than the area of created wetland (3.07 ac) (Appendix C, Figure 3). Although a larger area has satisfied the wetland hydrology criterion for 5% of the growing season in recent years, this area does not appear to be developing hydrophytic vegetation. In fact, the vegetation in most of the additional area has become dominated by perennial non-hydrophytes like *Lespedeza cuneata* (sericea lespedeza) and *Solidago canadensis* (Canada goldenrod). It is apparent that this area will probably never develop dominant hydrophytic vegetation.

During visits to the mitigation area, the following indicators of wetland hydrology were observed: surface water, high water table, saturation, sediment deposits, drift deposits, algal mat or crust, sparsely vegetated concave surface, water-stained leaves, surface soil cracks, and crayfish burrows.

**Project Goal #2:** Native, non-weedy, emergent wetland communities will be created (Sites 1-3).

Performance Standard A

Initially five emergent species (*Acorus calamus*, *Iris shrevei*, *Pontederia cordata*, *Sagittaria latifolia*, and *Scirpus acutus*) were to be planted at the FAS 1907 (IL 127) Tamms monitoring site (IDOT Wetland Conceptual Plan) Subsequently, *Juncus effusus* and *J. nodatus* appear to have also been planted at the mitigation area. In 2007, some of the *Iris* sp. present at the site were observed flowering and were determined to be of horticultural origin and not the native *Iris shrevei* that was supposed to have been planted. Numerous live, healthy individuals of all species, except *Sagittaria latifolia* and *Scirpus acutus*, were observed in 2011 (71%). This part of the performance standard is satisfied in 2011.

### Performance Standard B

Three emergent wetland sites (Sites 1A, 1B, 2, and 3) have been created at the FAS 1907 (IL 127) Tamms monitoring area. All three sites had a high percentage of native species (Site 1A = 88%, Site 1B = 92%, Site 2 = 82%, Site 3 = 83%; Table 3). Furthermore, percentages of native and non-weedy species were at acceptable levels (Site 1A = 71%, Site 1B = 76%, Site 2 = 63%, Site 3 = 59%) (Table 3). All three emergent sites satisfy performance standard B for project goal #2.

### Performance standard C

Performance standard C for project goal #2 states that no dominant species may be non-native species. All wetland sites were dominated by native species (Tables 4-6, 9-11). Performance standard C for project goal #2 is satisfied for Sites 1A, 1B, 2, and 3 in 2011.

**Project Goal #3:** A floodplain forest wetland community will be created (Site 4).

All planted tree seedlings/saplings within the FAS 1907 (IL 127) wetland mitigation area were located, identified to species, and their conditions were assessed. Initially, 201 tree saplings (17 *Fraxinus pennsylvanica* [green ash], 17 *Liquidambar styraciflua* [sweet or red gum], 17 *Platanus occidentalis* [sycamore], 38 *Quercus bicolor* [swamp white oak], 38 *Q. lyrata* [overcup oak], 39 *Q. palustris* [pin oak], and 35 *Taxodium distichum* [bald cypress]) were planted at the Tamms mitigation area. These are now large sapling to small trees and some are beginning to reproduce on site. In 2010, an additional 200 tree seedlings (50 sweet gum, 50 swamp white oak, 50 overcup oak, and 50 bald cypress) were planted to compensate for past mortality. In 2011, an additional 400 small tree seedlings/saplings were planted (100 bald cypress, 100 sweet gum, 100 swamp white oak, and 100 overcup oak).

Although the additional tree seedlings have exhibited poor survival, more than enough have survived to exceed the 150 seedling/saplings or 75% survivorship threshold. In 2011, 281 seedlings/saplings were observed alive. This total includes 135 of the original large sapling planting, 111 re-planted seedlings, and 35 apparently planted seedlings of pin oak. Pin oak was not mentioned in the replanting list; however, some of these specimens were staked and all appeared to have been introduced to the site. An additional 41 volunteer sweet gum and 6 pin oak seedlings were also counted in 2011. Additional native volunteer tree species at Site 4 include: *Acer negundo* (box elder), *Acer rubrum* (red maple), *Asimina triloba* (paw-paw), *Diospyros virginiana* (persimmon), *Gleditsia triacanthos* (honey locust), *Juniperus virginiana* (eastern red cedar), *Prunus serotina* (wild black cherry), *Quercus pagoda* (cherrybark oak), *Quercus velutina* (black oak), *Sassafras albidum* (sassafras), *Ulmus americana* (American elm), and *Ulmus rubra* (slippery elm).

This site, although it is not considered to be a wetland, is still valuable as a buffer area around Sites 2 and 3. Performance standard C for project goal #2 is satisfied.

## Summary and Recommendations

**Table 17. Summary table of FAS 1907 (IL 127) Tamms wetland monitoring site project goal success.**

<b>Project Goal #1</b> - Create jurisdictional wetlands (Sites 1-4).	
Performance Criterion A (hydrophytic vegetation)	Satisfied (Site 1-3), Unsatisfied (Site 4)
Performance Criterion B (hydric soils)	Satisfied (Site 1-3), Unsatisfied (Site 4)
Performance Criterion C (wetland hydrology)	Satisfied (Site 1-3), Unsatisfied (Site 4)
<b>Required Area of Wetland Creation</b> – Create 4.325 acres	
	Unsatisfied (only 3.07 acres created)
<b>Project Goal #2</b> – Create native, non-weedy emergent wetlands (Sites 1-3)	
Performance Standard A (50% planted emergent survival)	Satisfied (Sites 1-3)
Performance Standard B (50% native, non-weedy species)	Satisfied (Sites 1-3)
Performance Standard C (No non-native dominants)	Satisfied (Sites 1-3)
<b>Project Goal #3</b> – Create a floodplain forest wetland community (Site 4)	
Performance Standard (> 150 seedlings/saplings [75% survival])	Unsatisfied (Site 4 is not a wetland) Satisfied (Site 4)

Project goal #1 was satisfied for all sites except Site 4. Site 4, although not a wetland, is still valuable as a buffer for the created emergent wetlands (Sites 2 and 3) at the south end of the mitigation area. Likewise, project goals #2 and 3 were met by all of the wetland sites (Sites 1A, 1B, 2, and 3).

At this stage of monitoring, planted herbaceous species have survived satisfactorily and with the recent additions of replacement tree seedlings the tree survivorship is currently above the acceptable level of 150 tree seedlings/saplings or 75% survival.

Floristic quality of all emergent sites is very promising with all created emergent wetland sites being highly diverse. In Site 1A, 109 overall species were recorded including 96 native species. Site 1B had 95 overall species recorded with 87 natives, Site 2 had 83 total species with 68 natives, and Site 3 had 109 overall species recorded with 90 of them being native. These values are incredibly high for sites of such small size. Likewise, FQI scores for all the created wetland sites at FAS 1907 (IL 127) were above 20 (range from 27.8 at Site 2 to a high of 32.5 at Site 1A). FQI scores in this range are indicative of good natural quality.

Total area of the created wetlands at the Tamms site remains a concern. In 2011, we determined the area of created wetlands at FAS 1907 (IL 127) to be approximately 3.07 ac (Appendix C, Figure 3). The objective for project goal #1 was to create 4.325 ac of jurisdictional wetland. Although a larger area has satisfied the wetland hydrology standard and hydric soils standard in recent years, this area does not appear to be developing hydrophytic vegetation. In fact, the vegetation in most of the additional area has become dominated by perennial non-hydrophytes like *Lespedeza cuneata* (sericea lespedeza) and *Solidago canadensis* (Canada goldenrod). It is apparent that this area will probably never develop dominant hydrophytic vegetation. Additional mitigation area should be searched for and/or proposed wetland hydrology alterations should be completed if this requirement is to be met.

Dominant species and overall species composition of the three created emergent wetlands are on course for good development. All dominants in the created wetlands are native at this time and all four emergent wetlands are represented by greater than 50% native and non-weedy species. Nonetheless, many aggressive non-native species are present within the mitigation area. These species include: *Lespedeza cuneata* (sericea lespedeza), *Lonicera japonica* (Japanese honeysuckle), *Melilotus alba* (white sweet clover), *Melilotus officinalis* (yellow sweet clover), *Morus alba* (white mulberry), *Phalaris arundinacea* (reed canary grass), *Phragmites australis* (common reed), *Pyrus calleryana* (Bradford pear), *Rosa multiflora* (multiflora rose), *Sorghum halepense* (Johnson grass), *Typha angustifolia* (narrow-leaved cattail), and *Ulmus pumila* (Siberian elm).

Despite apparent control measures in 2010 and 2011, *Lespedeza cuneata* continues to be very abundant in upland portions of the mitigation area (Marcum et al. 2011). In fact, this weed is still considered a dominant in the upland buffer area (Site 4). Continued management using prescribed burning, mowing, and herbicide application should be continued to reduce the impact of this aggressive species. Since *Lespedeza cuneata* is found along the wetland margins and in the upland buffer area any future management should be limited to this area of the mitigation site. The proposed treatment area is depicted in Figure 4 of the 2010 Tamms monitoring report (Marcum et al. 2011). See Marcum et al. (2010) for further management strategies used on *Lespedeza cuneata*.

*Sorghum halepense* spread significantly between 2009 and 2010 and was considered a dominant species within the upland buffer area (Site 4) in 2010. This species, while still present and abundant, was less abundant in 2011. It is no longer considered a dominant species. Management for this invasive species is still recommended. See Marcum et al. (2011) for management strategies used on *Sorghum halepense*.

*Phalaris arundinacea* patches are still present at Sites 1A, 2, and 4. Although this species has not become a significant problem at the mitigation area, these patches should be treated before this highly invasive species spreads throughout the created wetland sites. See Marcum et al. (2011) for management strategies used on *Phalaris arundinacea*.

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**APPENDIX A**

**Wetland Determination Forms**

**DATA FORM**  
**ROUTINE WETLAND DETERMINATION**  
(1987 COE Wetlands Delineation Manual)

Project/Site: <u>Tamms Mitigation Area/Site 1A, wet meadow</u> Applicant/Owner: <u>Illinois Department of Transportation</u> Investigator: <u>Paul B. Marcum, Dennis J. Keene, and David M. Ketzner</u>	Date: <u>4 October, 2011</u> County: <u>Alexander</u> State: <u>Illinois</u>
Do Normal Circumstances exist on the site? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Is the site significantly disturbed (Atypical Situation)? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Is the area a potential Problem Area? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> (If needed, explain on reverse.)	Community ID: <u>Wet Meadow</u> Transect ID: _____ Plot ID: <u>Site 1A</u>

### VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. <u>Carex tribuloides IV=16.0702</u>	herb	FACW+	9. _____	_____	_____
2. <u>Echinochloa muricata IV=12.7531</u>	herb	OBL	10. _____	_____	_____
3. <u>Aster vimineus IV=10.7663</u>	herb	FACW-	11. _____	_____	_____
4. <u>Aster ontarionis IV=5.0305</u>	herb	FAC	12. _____	_____	_____
5. <u>Scirpus atrovirens IV=4.2971</u>	herb	OBL	13. _____	_____	_____
6. <u>Ludwigia palustris IV=3.5596</u>	herb	OBL	14. _____	_____	_____
7. _____	_____	_____	15. _____	_____	_____
8. _____	_____	_____	16. _____	_____	_____

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-): 100%

Remarks:  
Greater than 50% of the dominant plant species are OBL, FACW, FAC+, or FAC; therefor, this site exhibits dominant hydrophytic vegetation.

### HYDROLOGY

<input checked="" type="checkbox"/> Recorded Data (Describe in Remarks): <input type="checkbox"/> Stream, Lake, or Tide Gauge <input type="checkbox"/> Aerial Photographs <input checked="" type="checkbox"/> Other <input type="checkbox"/> No Recorded Data Available <hr/> Field Observations: Depth of Surface Water: <u>NA</u> (in.) Depth to Free Water in Pit: <u>NA</u> (in.) Depth to Saturated Soil: <u>0 to 40</u> (in.)	Wetland Hydrology Indicators: Primary Indicators: <input type="checkbox"/> Inundated <input checked="" type="checkbox"/> Saturated in Upper 12 Inches <input type="checkbox"/> Water Marks <input checked="" type="checkbox"/> Drift Lines <input checked="" type="checkbox"/> Sediment Deposits <input type="checkbox"/> Drainage Patterns in Wetlands Secondary Indicators (2 or more required): <input type="checkbox"/> Oxidized Root Channels in Upper 12 Inches <input checked="" type="checkbox"/> Water-Stained Leaves <input type="checkbox"/> Local Soil Survey Data <input checked="" type="checkbox"/> FAC-Neutral Test <input type="checkbox"/> Other (Explain in Remarks)
Remarks: The ISGS hydrology monitoring data (Pociask and Monson 2011; Miner et al. 2011) show this site satisfies the wetland hydrology criterion. Furthermore, numerous primary and secondary indicators of wetland hydrology were observed at this site.	

**SOILS**

Map Unit Name (Series and Phase): <u>Okaw silt loam</u>		Drainage Class: <u>poorly</u>			
Taxonomy (Subgroup): <u>Chromic Vertic Albaqualfs</u>		Field Observations Confirm Mapped Type? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>			
<b>Profile Description:</b>					
Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/ Size/Contrast	Texture, Concretions, Structure, etc.
0 - 3		10 5/2, N 5/	10YR 5/4	FFD	sil, gr
3 - 14		2.5Y 6/1, 6/2	7.5YR 5/8	MCP	sicl, pl
14 - 23		2.5Y 6/2	7.5YR 5/8	CMP	sicl, pr
			10YR 5/6	CMP	sicl, pr
23 - 34		2.5Y 6/2	7.5YR 5/8	MCP	sicl, pr
			10YR 5/6	PMP	sicl, pr
<b>Hydric Soil Indicators:</b>					
<input type="checkbox"/>	Histosol	<input type="checkbox"/>	Concretions		
<input type="checkbox"/>	Histic Epipedon	<input type="checkbox"/>	High Organic Content in Surface Layer in Sandy Soils		
<input type="checkbox"/>	Sulfidic Odor	<input type="checkbox"/>	Organic Streaking in Sandy Soils		
<input checked="" type="checkbox"/>	Aquic Moisture Regime	<input checked="" type="checkbox"/>	Listed on Local Hydric Soils List		
<input checked="" type="checkbox"/>	Reducing Conditions	<input type="checkbox"/>	Listed on National Hydric Soils List		
<input checked="" type="checkbox"/>	Gleyed or Low-Chroma Colors	<input type="checkbox"/>	Other (Explain in Remarks)		
Remarks: Some of the surface horizon was excavated from this area.					

**WETLAND DETERMINATION**

Hydrophytic Vegetation Present?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Is this Sampling Point Within a Wetland? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Wetland Hydrology Present?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	
Hydric Soils Present?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	
Remarks: Dominant hydrophytic vegetation, hydric soils, and wetland hydrology are present; therefore, this site is a wetland.		

**DATA FORM**  
**ROUTINE WETLAND DETERMINATION**  
(1987 COE Wetlands Delineation Manual)

Project/Site: <u>Tamms Mitigation Area/Site 1B, emergent pond/wet meadow</u> Applicant/Owner: <u>Illinois Department of Transportation</u> Investigator: <u>Paul B. Marcum, Dennis J. Keene, and David M. Ketzner</u>	Date: <u>4 October, 2011</u> County: <u>Alexander</u> State: <u>Illinois</u>
Do Normal Circumstances exist on the site? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Is the site significantly disturbed (Atypical Situation)? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Is the area a potential Problem Area? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> (If needed, explain on reverse.)	Community ID: <u>Emergent Pond/</u> Transect ID: <u>Wet Meadow</u> Plot ID: <u>Site 1B</u>

### VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. <u><i>Boltonia asteroides</i> IV=23.3818</u>	herb	FACW	9. _____	_____	_____
2. <u><i>Aster vimineus</i> IV=13.7833</u>	herb	FACW-	10. _____	_____	_____
3. <u><i>Echinochloa muricata</i> IV=9.5797</u>	herb	OBL	11. _____	_____	_____
4. <u><i>Aster ontarionis</i> IV=6.0080</u>	herb	FAC	12. _____	_____	_____
5. _____	_____	_____	13. _____	_____	_____
6. _____	_____	_____	14. _____	_____	_____
7. _____	_____	_____	15. _____	_____	_____
8. _____	_____	_____	16. _____	_____	_____

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-): 100%

Remarks:  
Greater than 50% of the dominant plant species are OBL, FACW, FAC+, or FAC; therefor, this site exhibits dominant hydrophytic vegetation.

### HYDROLOGY

<input checked="" type="checkbox"/> Recorded Data (Describe in Remarks): <input type="checkbox"/> Stream, Lake, or Tide Gauge <input type="checkbox"/> Aerial Photographs <input checked="" type="checkbox"/> Other <input type="checkbox"/> No Recorded Data Available	Wetland Hydrology Indicators: Primary Indicators: <input type="checkbox"/> Inundated <input checked="" type="checkbox"/> Saturated in Upper 12 Inches <input checked="" type="checkbox"/> Water Marks <input checked="" type="checkbox"/> Drift Lines <input checked="" type="checkbox"/> Sediment Deposits <input type="checkbox"/> Drainage Patterns in Wetlands Secondary Indicators (2 or more required): <input type="checkbox"/> Oxidized Root Channels in Upper 12 Inches <input checked="" type="checkbox"/> Water-Stained Leaves <input type="checkbox"/> Local Soil Survey Data <input checked="" type="checkbox"/> FAC-Neutral Test <input type="checkbox"/> Other (Explain in Remarks)
Field Observations: Depth of Surface Water: <u>NA</u> (in.) Depth to Free Water in Pit: <u>NA</u> (in.) Depth to Saturated Soil: <u>0 to 40</u> (in.)	Remarks: The ISGS hydrology monitoring data (Pociask and Monson 2011; Miner et al. 2011) show this site satisfies the wetland hydrology criterion. Furthermore, numerous primary and secondary indicators of wetland hydrology were observed at this site.

## SOILS

Map Unit Name (Series and Phase): <u>Okaw silt loam</u>		Drainage Class: <u>poorly</u>			
Taxonomy (Subgroup): <u>Chromic Vertic Albaqualfs</u>		Field Observations Confirm Mapped Type? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>			
<b>Profile Description:</b>					
Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/ Size/Contrast	Texture, Concretions, Structure, etc.
0 - 3		2.5Y 5.1, 5Y 6/1, 7/1, 10YR 5/2	7.5YR 5/8	CMP	sicl, gr
			7.5YR 5/6	CMP	
3 - 6		2.5Y 5/1, 6/1	7.5YR 5/6	CMP	sicl, bl
			7.5YR 5/8	FFP	
6 - 28		2.5Y 6/2, 6/1	7.5YR 4/6	FCD	sic, pr
28 - 38		2.5Y 6/2	10YR 5/4	MMP	sic, pr
<b>Hydric Soil Indicators:</b>					
<input type="checkbox"/> Histosol	<input type="checkbox"/> Concretions				
<input type="checkbox"/> Histic Epipedon	<input type="checkbox"/> High Organic Content in Surface Layer in Sandy Soils				
<input type="checkbox"/> Sulfidic Odor	<input type="checkbox"/> Organic Streaking in Sandy Soils				
<input checked="" type="checkbox"/> Aquic Moisture Regime	<input checked="" type="checkbox"/> Listed on Local Hydric Soils List				
<input type="checkbox"/> Reducing Conditions	<input type="checkbox"/> Listed on National Hydric Soils List				
<input checked="" type="checkbox"/> Gleyed or Low-Chroma Colors	<input type="checkbox"/> Other (Explain in Remarks)				
Remarks: Some of the surface horizon was excavated from this area.					

## WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Is this Sampling Point Within a Wetland? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	
Hydric Soils Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	
Remarks: Dominant hydrophytic vegetation, hydric soils, and wetland hydrology are present; therefore, this site is a wetland.	

**DATA FORM**  
**ROUTINE WETLAND DETERMINATION**  
 (1987 COE Wetlands Delineation Manual)

Project/Site: <u>Tamms Mitigation Area/Site 2, wet meadow</u> Applicant/Owner: <u>Illinois Department of Transportation</u> Investigator: <u>Paul B. Marcum, Dennis J. Keene, and David M. Ketzner</u>	Date: <u>4 October, 2011</u> County: <u>Alexander</u> State: <u>Illinois</u>
Do Normal Circumstances exist on the site? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Is the site significantly disturbed (Atypical Situation)? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Is the area a potential Problem Area? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> (If needed, explain on reverse.)	Community ID: <u>Wet Meadow</u> Transect ID: _____ Plot ID: <u>Site 2</u>

**VEGETATION**

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. <u>Aster vimineus</u>	herb	FACW-	9. _____	_____	_____
2. <u>Juncus nodatus</u>	herb	OBL	10. _____	_____	_____
3. _____	_____	_____	11. _____	_____	_____
4. _____	_____	_____	12. _____	_____	_____
5. _____	_____	_____	13. _____	_____	_____
6. _____	_____	_____	14. _____	_____	_____
7. _____	_____	_____	15. _____	_____	_____
8. _____	_____	_____	16. _____	_____	_____

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-): 100%

Remarks:  
 Greater than 50% of the dominant plant species are OBL, FACW, FAC+, or FAC; therefor, this site exhibits dominant hydrophytic vegetation.

**HYDROLOGY**

<input checked="" type="checkbox"/> Recorded Data (Describe in Remarks): <input type="checkbox"/> Stream, Lake, or Tide Gauge <input type="checkbox"/> Aerial Photographs <input checked="" type="checkbox"/> Other <input type="checkbox"/> No Recorded Data Available <hr/> Field Observations: Depth of Surface Water: <u>NA</u> (in.) Depth to Free Water in Pit: <u>NA</u> (in.) Depth to Saturated Soil: <u>0 to 40</u> (in.)	Wetland Hydrology Indicators: Primary Indicators: <input type="checkbox"/> Inundated <input type="checkbox"/> Saturated in Upper 12 Inches <input type="checkbox"/> Water Marks <input type="checkbox"/> Drift Lines <input type="checkbox"/> Sediment Deposits <input type="checkbox"/> Drainage Patterns in Wetlands Secondary Indicators (2 or more required): <input type="checkbox"/> Oxidized Root Channels in Upper 12 Inches <input checked="" type="checkbox"/> Water-Stained Leaves <input type="checkbox"/> Local Soil Survey Data <input checked="" type="checkbox"/> FAC-Neutral Test <input checked="" type="checkbox"/> Other (Explain in Remarks)
Remarks: The ISGS hydrology monitoring data (Pociask and Monson 2011; Miner et al. 2011) show this site satisfies the wetland hydrology criterion. Furthermore, numerous primary and secondary indicators of wetland hydrology were observed at this site (other indicators include algal mats and surface soil cracks).	

**SOILS**

Map Unit Name (Series and Phase): <u>Cape silty clay loam</u>		Drainage Class: <u>poorly</u>
Taxonomy (Subgroup): <u>Vertic Endoaquepts</u>		Field Observations Confirm Mapped Type? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>

Profile Description:					
Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/ Size/Contrast	Texture, Concretions, Structure, etc.
0 - 6		2.5Y 5/1, 10Y 2.5/	7.5YR 5/8	CMP	sil, gr, few 10YR 3/1 con
6 - 15		2.5Y 6/2	7.5YR 5/4	FMP	sicl, bl, few 10YR 3/1 con
			7.5YR 5/8	CMP	
15 - 22		2.5Y 6/2	10YR 5/4	FMD	sic, pr, few 10YR 3/1 con
			7.5YR 5/8	FMP	
22 - 36		2.5Y 6/2	10YR 5/4	MCP	sic, pr

Hydric Soil Indicators:

<input type="checkbox"/> Histosol	<input checked="" type="checkbox"/> Concretions
<input type="checkbox"/> Histic Epipedon	<input type="checkbox"/> High Organic Content in Surface Layer in Sandy Soils
<input type="checkbox"/> Sulfidic Odor	<input type="checkbox"/> Organic Streaking in Sandy Soils
<input checked="" type="checkbox"/> Aquic Moisture Regime	<input checked="" type="checkbox"/> Listed on Local Hydric Soils List
<input type="checkbox"/> Reducing Conditions	<input type="checkbox"/> Listed on National Hydric Soils List
<input checked="" type="checkbox"/> Gleyed or Low-Chroma Colors	<input type="checkbox"/> Other (Explain in Remarks)

Remarks:

Some of the surface horizon was excavated from this area.

**WETLAND DETERMINATION**

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Is this Sampling Point Within a Wetland? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	
Hydric Soils Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	

Remarks:

Dominant hydrophytic vegetation, hydric soils, and wetland hydrology are present; therefore, this site is a wetland.

**DATA FORM**  
**ROUTINE WETLAND DETERMINATION**  
(1987 COE Wetlands Delineation Manual)

Project/Site: <u>Tamms Mitigation Area/Site 3, emergent pond</u> Applicant/Owner: <u>Illinois Department of Transportation</u> Investigator: <u>Paul B. Marcum, Dennis J. Keene, and David M. Ketzner</u>	Date: <u>4 October, 2011</u> County: <u>Alexander</u> State: <u>Illinois</u>
Do Normal Circumstances exist on the site? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Is the site significantly disturbed (Atypical Situation)? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Is the area a potential Problem Area? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> (If needed, explain on reverse.)	Community ID: <u>Emergent Pond</u> Transect ID: _____ Plot ID: <u>Site 3</u>

### VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. <u>Aster vimineus IV=15.5246</u>	herb	FACW-	9. _____	_____	_____
2. <u>Boltonia asteroides IV=15.3535</u>	herb	FACW	10. _____	_____	_____
3. <u>Juncus nodatus IV=12.4570</u>	herb	OBL	11. _____	_____	_____
4. <u>Diodia virginiana IV=7.3833</u>	herb	FACW	12. _____	_____	_____
5. _____	_____	_____	13. _____	_____	_____
6. _____	_____	_____	14. _____	_____	_____
7. _____	_____	_____	15. _____	_____	_____
8. _____	_____	_____	16. _____	_____	_____

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-): 100%

Remarks:  
Greater than 50% of the dominant plant species are OBL, FACW, FAC+, or FAC; therefor, this site exhibits dominant hydrophytic vegetation.

### HYDROLOGY

<input checked="" type="checkbox"/> Recorded Data (Describe in Remarks): <input type="checkbox"/> Stream, Lake, or Tide Gauge <input type="checkbox"/> Aerial Photographs <input checked="" type="checkbox"/> Other <input type="checkbox"/> No Recorded Data Available	Wetland Hydrology Indicators: <b>Primary Indicators:</b> <input checked="" type="checkbox"/> Inundated <input checked="" type="checkbox"/> Saturated in Upper 12 Inches <input checked="" type="checkbox"/> Water Marks <input checked="" type="checkbox"/> Drift Lines <input checked="" type="checkbox"/> Sediment Deposits <input type="checkbox"/> Drainage Patterns in Wetlands <b>Secondary Indicators (2 or more required):</b> <input type="checkbox"/> Oxidized Root Channels in Upper 12 Inches <input type="checkbox"/> Water-Stained Leaves <input type="checkbox"/> Local Soil Survey Data <input checked="" type="checkbox"/> FAC-Neutral Test <input type="checkbox"/> Other (Explain in Remarks)
Field Observations: Depth of Surface Water: <u>2</u> (in.) Depth to Free Water in Pit: <u>NA</u> (in.) Depth to Saturated Soil: <u>0 to 40</u> (in.)	Remarks: The ISGS hydrology monitoring data (Pociask and Monson 2011; Miner et al. 2011) show this site satisfies the wetland hydrology criterion. Furthermore, numerous primary and secondary indicators of wetland hydrology were observed at this site.

## SOILS

Map Unit Name (Series and Phase): <u>Cape silty clay loam</u>		Drainage Class: <u>poorly</u>			
Taxonomy (Subgroup): <u>Vertic Endoaquepts</u>		Field Observations Confirm Mapped Type? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>			
<b>Profile Description:</b>					
Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/ Size/Contrast	Texture, Concretions, Structure, etc.
0 - 6		2.5Y 5/1, 10Y 2.5/	7.5YR 5/8	CMP	sil, gr, few 10YR 3/1 con
6 - 15		2.5Y 6/2	7.5YR 5/4	FMP	sicl, bl, few 10YR 3/1 con
			7.5YR 5/8	FMP	
15 - 22		2.5Y 6/2	10YR 5/4	FMD	sic, pr, few 10YR 3/1 con
			7.5YR 5/8	FMP	
22 - 36		2.5Y 6/2	10YR 5/4	MCD	sic, pr
Hydric Soil Indicators:					
<input type="checkbox"/>	Histosol	<input checked="" type="checkbox"/>	Concretions		
<input type="checkbox"/>	Histic Epipedon	<input type="checkbox"/>	High Organic Content in Surface Layer in Sandy Soils		
<input type="checkbox"/>	Sulfidic Odor	<input type="checkbox"/>	Organic Streaking in Sandy Soils		
<input checked="" type="checkbox"/>	Aquic Moisture Regime	<input checked="" type="checkbox"/>	Listed on Local Hydric Soils List		
<input type="checkbox"/>	Reducing Conditions	<input type="checkbox"/>	Listed on National Hydric Soils List		
<input checked="" type="checkbox"/>	Gleyed or Low-Chroma Colors	<input type="checkbox"/>	Other (Explain in Remarks)		
Remarks: This soil has been severely scraped.					

## WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Is this Sampling Point Within a Wetland? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Wetland Hydrology Present?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	
Hydric Soils Present?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	
Remarks: Dominant hydrophytic vegetation, hydric soils, and wetland hydrology are present; therefore, this site is a wetland.		

**DATA FORM**  
**ROUTINE WETLAND DETERMINATION**  
(1987 COE Wetlands Delineation Manual)

Project/Site: <u>Tamms Mitigation Area/Site 4, shrubland (proposed floodplain forest)</u> Applicant/Owner: <u>Illinois Department of Transportation</u> Investigator: <u>Paul B. Marcum, Dennis J. Keene, and David M. Ketzner</u>	Date: <u>4 October, 2011</u> County: <u>Alexander</u> State: <u>Illinois</u>
Do Normal Circumstances exist on the site? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Is the site significantly disturbed (Atypical Situation)? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Is the area a potential Problem Area? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> (If needed, explain on reverse.)	Community ID: <u>Shrubland</u> Transect ID: _____ Plot ID: <u>Site 4</u>

### VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. <u>Quercus bicolor</u>	<u>sapling/shrub</u>	<u>Planted</u>	9. _____	_____	_____
2. <u>Quercus lyrata</u>	<u>sapling/shrub</u>	<u>Planted</u>	10. _____	_____	_____
3. <u>Quercus palustris</u>	<u>sapling/shrub</u>	<u>Planted</u>	11. _____	_____	_____
4. <u>Campsis radicans</u>	<u>herb</u>	<u>FAC</u>	12. _____	_____	_____
5. <u>Lespedeza cuneata</u>	<u>herb</u>	<u>NI (FACU/UPL)</u>	13. _____	_____	_____
6. <u>Poa pratensis</u>	<u>herb</u>	<u>FAC-</u>	14. _____	_____	_____
7. <u>Solidago canadensis</u>	<u>herb</u>	<u>FACU</u>	15. _____	_____	_____
8. _____	_____	_____	16. _____	_____	_____

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-): 25%

Remarks:  
Less than 50% of plant species are OBL, FACW, FAC+, or FAC; therefor, this site does not exhibit dominant hydrophytic vegetation.

### HYDROLOGY

<input checked="" type="checkbox"/> Recorded Data (Describe in Remarks): <input type="checkbox"/> Stream, Lake, or Tide Gauge <input type="checkbox"/> Aerial Photographs <input checked="" type="checkbox"/> Other <input type="checkbox"/> No Recorded Data Available <hr/> Field Observations: Depth of Surface Water: _____ (in.) Depth to Free Water in Pit: _____ (in.) Depth to Saturated Soil: _____ (in.)	Wetland Hydrology Indicators: <b>Primary Indicators:</b> <input type="checkbox"/> Inundated <input type="checkbox"/> Saturated in Upper 12 Inches <input type="checkbox"/> Water Marks <input type="checkbox"/> Drift Lines <input type="checkbox"/> Sediment Deposits <input type="checkbox"/> Drainage Patterns in Wetlands <b>Secondary Indicators (2 or more required):</b> <input type="checkbox"/> Oxidized Root Channels in Upper 12 Inches <input type="checkbox"/> Water-Stained Leaves <input type="checkbox"/> Local Soil Survey Data <input type="checkbox"/> FAC-Neutral Test <input type="checkbox"/> Other (Explain in Remarks)
Remarks: The ISGS hydrology monitoring data (Pociask and Monson 2011; Miner et al. 2011) show that part of this site satisfies the wetland hydrology criterion; however, no indicators of wetland hydrology were observed in this area.	

**SOILS**

Map Unit Name (Series and Phase): <u>Undetermined</u>		Drainage Class: <u>somewhat poorly</u>			
Taxonomy (Subgroup): <u>NA</u>		Field Observations Confirm Mapped Type? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>			
<b>Profile Description:</b>					
Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/ Size/Contrast	Texture, Concretions, Structure, etc.
0 - 4		10YR 4/2			sil, gr
4 - 10		10YR 4/3	10YR 5/8	CMP	sic, pl, few 10YR 2/1 con
10 - 21		2.5Y 6/2, 6/3, 5/3, 5/4	7.5YR 5/8	FMP	sic, pr, few 10YR 2/1 con
			10YR 5/4	FFD	
21 - 36		2.5Y 5/3, 6/2, 10YR 6/2	7.5YR 4/6	MCP	sic, pr, few 10YR 2/1 con
			7.5YR 5/8	FMP	
Hydric Soil Indicators:					
<input type="checkbox"/> Histosol	<input type="checkbox"/> Concretions				
<input type="checkbox"/> Histic Epipedon	<input type="checkbox"/> High Organic Content in Surface Layer in Sandy Soils				
<input type="checkbox"/> Sulfidic Odor	<input type="checkbox"/> Organic Streaking in Sandy Soils				
<input type="checkbox"/> Aquic Moisture Regime	<input type="checkbox"/> Listed on Local Hydric Soils List				
<input type="checkbox"/> Reducing Conditions	<input type="checkbox"/> Listed on National Hydric Soils List				
<input type="checkbox"/> Gleyed or Low-Chroma Colors	<input type="checkbox"/> Other (Explain in Remarks)				
Remarks: No hydric soil indicators present at this site.					

**WETLAND DETERMINATION**

Hydrophytic Vegetation Present?    Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Wetland Hydrology Present?        Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Hydric Soils Present?                Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Is this Sampling Point Within a Wetland?    Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Remarks: Dominant hydrophytic vegetation is absent and hydric soils and wetland hydrology area both absent, at least at most of this site. This site is not a wetland.	

**APPENDIX B**

**Wetland Plant Species Lists**

## Site 1A – Wet Meadow

### SPECIES LIST (Dominant species and strata indicated by bold.)

Scientific name	Common name	Stratum	Wetland indicator status	Coefficient of conservatism
<i>Acalypha rhomboidea</i>	three-seeded mercury	herb	FACU	0
<i>Acer negundo</i>	box elder	sapling/shrub, herb	FACW-	1
<i>Acer rubrum</i>	red maple	shrub, herb	FAC	5
<i>Acer saccharinum</i>	silver maple	shrub, herb	FACW	1
<i>Acorus calamus</i>	sweetflag	herb	OBL	4
<i>Ambrosia artemisiifolia</i>	common ragweed	herb	FACU	0
<i>Ambrosia trifida</i>	giant ragweed	herb	FAC+	0
<i>Ammannia coccinea</i>	long-leaved ammannia	herb	OBL	5
<i>Andropogon virginicus</i>	broom sedge	herb	FAC-	1
<i>Apios americana</i>	groundnut	herb	FACW	4
<b><i>Aster ontarionis</i></b>	<b>Ontario aster</b>	<b>herb</b>	<b>FAC</b>	<b>4</b>
<i>Aster simplex</i>	panicled aster	herb	FACW	3
<b><i>Aster vimineus</i></b>	<b>frost flower</b>	<b>herb</b>	<b>FACW-</b>	<b>3</b>
<i>Barbarea vulgaris</i>	winter cress	herb	FAC	*
<i>Boltonia asteroides</i>	false aster	herb	FACW	5
<i>Campsis radicans</i>	trumpet creeper	w-vine, shrub, herb	FAC	2
<i>Carex annectens</i>	large yellow fox sedge	herb	FACW	3
<i>Carex crinita</i>	fringed sedge	herb	OBL	8
<i>Carex festucacea</i>	fescue oval sedge	herb	FAC	6
<i>Carex hyalinolepis</i>	southern lake sedge	herb	OBL	4
<i>Carex normalis</i>	spreading oval sedge	herb	FACW	4
<i>Carex shortiana</i>	Short's sedge	herb	FACW+	4
<i>Carex squarrosa</i>	narrow-leaved cattail sedge	herb	OBL	5
<b><i>Carex tribuloides</i></b>	<b>awl-fruited oval sedge</b>	<b>herb</b>	<b>FACW+</b>	<b>3</b>
<i>Carex vulpinoidea</i>	fox sedge	herb	OBL	3
<i>Carya ovata</i>	shagbark hickory	herb	FACU	4
<i>Cephalanthus occidentalis</i>	buttonbush	shrub	OBL	4
<i>Chasmanthium latifolium</i>	sea oats	herb	FACW	4
<i>Crataegus mollis</i>	downy hawthorn	herb	FACW-	2
<i>Cynanchum laeve</i>	blue vine	herb	FAC	1
<i>Cyperus esculentus</i>	yellow nut-sedge	herb	FACW	0
<i>Diodia virginiana</i>	large buttonweed	herb	FACW	4
<i>Diospyros virginiana</i>	persimmon	sapling/shrub, herb	FAC	2
<b><i>Echinochloa muricata</i></b>	<b>barnyard grass</b>	<b>herb</b>	<b>OBL</b>	<b>0</b>
<i>Eleocharis acicularis</i>	needle spike rush	herb	OBL	3
<i>Eleocharis erythropoda</i>	red-rooted spikerush	herb	OBL	3
<i>Eleocharis obtusa</i>	blunt spike rush	herb	OBL	2
<i>Eleocharis verrucosa</i>	slender spike rush	herb	OBL	6
<i>Elymus virginicus</i>	Virginia wild rye	herb	FACW-	4
<i>Euthamia graminifolia</i>	grassleaf goldenrod	herb	FACW-	3
<i>Festuca arundinacea</i>	tall fescue	herb	FACU+	*
<i>Fraxinus pennsylvanica</i>	green ash	shrub, herb	FACW	2
<i>Galium aparine</i>	annual bedstraw	herb	FACU	0
<i>Gleditsia triacanthos</i>	honey locust	shrub, herb	FAC	2
<i>Glyceria striata</i>	fowl manna grass	herb	OBL	4
<i>Hibiscus lasiocarpus</i>	hairy rose mallow	herb	FACW+	5

*Species list continues on the following page . . .*

## Site 1A – Wet Meadow continued

### SPECIES LIST (Dominant species and strata indicated by bold.)

Scientific name	Common name	Stratum	Wetland indicator status	Coefficient of conservatism
<i>Ipomoea pandurata</i>	wild sweet potato vine	herb	FACU	2
<i>Iva annua</i>	marsh elder	herb	FAC	0
<i>Juncus acuminatus</i>	knotty-leaved rush	herb	OBL	4
<i>Juncus effusus solutus</i>	common rush	herb	OBL	4
<i>Juncus interior</i>	inland rush	herb	FAC+	3
<i>Juncus nodatus</i>	stout rush	herb	OBL	6
<i>Leersia oryzoides</i>	rice cutgrass	herb	OBL	3
<i>Lespedeza cuneata</i>	sericea lespedeza	herb	NI	*
<i>Lindernia dubia</i>	false pimpernel	herb	OBL	5
<i>Liquidambar styraciflua</i>	sweet gum	sapling/shrub, herb	FACW	6
<i>Lonicera japonica</i>	Japanese honeysuckle	w-vine, herb	FACU	*
<i>Ludwigia alternifolia</i>	seedbox	herb	OBL	5
<i>Ludwigia glandulosa</i>	false loosestrife	herb	OBL	8
<b><i>Ludwigia palustris americana</i></b>	<b>marsh purslane</b>	<b>herb</b>	<b>OBL</b>	<b>4</b>
<i>Ludwigia polycarpa</i>	false loosestrife	herb	OBL	5
<i>Mimulus alatus</i>	winged monkey flower	herb	OBL	6
<i>Mollugo verticillata</i>	carpetweed	herb	FAC	*
<i>Panicum clandestinum</i>	deer-tongue grass	herb	FACW	4
<i>Panicum dichotomiflorum</i>	fall panicum	herb	FACW-	0
<i>Panicum implicatum</i>	old field panic grass	herb	FAC	2
<i>Panicum rigidulum</i>	munro grass	herb	FACW	6
<i>Panicum virgatum</i>	prairie switchgrass	herb	FAC+	4
<i>Parthenocissus quinquefolia</i>	Virginia creeper	herb	FAC-	2
<i>Penthorum sedoides</i>	ditch stonecrop	herb	OBL	2
<i>Perilla frutescens</i>	beefsteak plant	herb	FAC	*
<i>Phalaris arundinacea</i>	reed canary grass	herb	FACW+	*
<i>Poa pratensis</i>	Kentucky bluegrass	herb	FAC-	*
<i>Polygonum hydropiper</i>	common smartweed	herb	OBL	*
<i>Polygonum hydropiperoides</i>	mild water pepper	herb	OBL	4
<i>Polygonum pensylvanicum</i>	giant smartweed	herb	FACW+	1
<i>Polygonum punctatum</i>	dotted smartweed	herb	OBL	3
<i>Polygonum scandens</i>	climbing buckwheat	herb	FAC	2
<i>Pontederia cordata</i>	pickerelweed	herb	OBL	8
<i>Populus deltoides</i>	eastern cottonwood	shrub, herb	FAC+	2
<i>Potentilla simplex</i>	common cinquefoil	herb	FACU-	3
<i>Quercus pagoda</i>	cherrybark oak	shrub, herb	FAC	5
<i>Quercus palustris</i>	pin oak	herb	FACW	4
<i>Ranunculus laxicaulis</i>	spearwort	herb	OBL	6
<i>Rorippa islandica</i>	marsh yellow cress	herb	OBL	4
<i>Rosa multiflora</i>	multiflora rose	shrub	FACU	*
<i>Rubus pensilvanicus</i>	blackberry	shrub	FAC-	2
<i>Rumex crispus</i>	curly dock	herb	FAC+	*
<i>Salix nigra</i>	black willow	sapling/shrub, herb	OBL	3
<b><i>Scirpus atrovirens</i></b>	<b>dark green bulrush</b>	<b>herb</b>	<b>OBL</b>	<b>4</b>
<i>Scirpus cyperinus</i>	wool grass	herb	OBL	5
<i>Senecio glabellus</i>	butterweed	herb	OBL	0

*Species list continues on the following page . . .*

### Site 1A – Wet Meadow continued

#### SPECIES LIST (Dominant species and strata indicated by bold.)

Scientific name	Common name	Stratum	Wetland indicator status	Coefficient of conservatism
<i>Setaria faberi</i>	giant foxtail	herb	FACU+	*
<i>Solanum carolinense</i>	horse nettle	herb	FACU-	0
<i>Solidago canadensis</i>	Canada goldenrod	herb	FACU	1
<i>Stachys palustris</i>	woundwort	herb	OBL	5
ϕ <i>Taxodium distichum</i>	bald cypress	shrub	OBL	7
<i>Teucrium canadense</i>	American germander	herb	FACW-	3
<i>Toxicodendron radicans</i>	poison ivy	shrub, herb	FAC+	1
<i>Typha angustifolia</i>	narrow-leaved cattail	herb	OBL	*
<i>Typha latifolia</i>	cattail	herb	OBL	1
<i>Ulmus alata</i>	winged elm	shrub, herb	FACU	5
<i>Ulmus americana</i>	American elm	shrub, herb	FACW-	5
<i>Ulmus rubra</i>	slippery elm	shrub	FAC	3
<i>Verbesina alternifolia</i>	wingstem	herb	FACW	4
<i>Vernonia gigantea</i>	tall iron weed	herb	FAC	4
<i>Vernonia missurica</i>	Missouri ironweed	herb	FAC+	5
<i>Vitis cinerea</i>	winter grape	herb	FACW-	4
<i>Xanthium strumarium</i>	cocklebur	herb	FAC	0

\* Non-native species

mCv = 3.3

ϕ Planted

FQI =  $\sum C/32.5$

## Site 1B – Emergent Pond/Wet Meadow

### SPECIES LIST (Dominant species and strata indicated by bold.)

Scientific name	Common name	Stratum	Wetland indicator status	Coefficient of conservatism
<i>Acalypha rhomboidea</i>	three-seeded mercury	herb	FACU	0
<i>Acalypha virginica</i>	three-seeded mercury	herb	FACU	2
<i>Acer negundo</i>	box elder	sapling/shrub, herb	FACW-	1
<i>Acer rubrum</i>	red maple	shrub, herb	FAC	5
<i>Acorus calamus</i>	sweetflag	herb	OBL	4
<i>Agrostis hyemalis</i>	hair grass	herb	FAC-	1
<i>Ambrosia artemisiifolia</i>	common ragweed	herb	FACU	0
<i>Ammannia coccinea</i>	long-leaved ammannia	herb	OBL	5
<i>Ampelopsis cordata</i>	raccoon grape	w-vine	FAC+	2
<i>Andropogon virginicus</i>	broom sedge	herb	FAC-	1
<i>Apios americana</i>	groundnut	herb	FACW	4
<i>Apocynum cannabinum</i>	dogbane	herb	FAC	2
<b><i>Aster ontarionis</i></b>	<b>Ontario aster</b>	<b>herb</b>	<b>FAC</b>	<b>4</b>
<i>Aster simplex</i>	panicled aster	herb	FACW	3
<b><i>Aster vimineus</i></b>	<b>frost flower</b>	<b>herb</b>	<b>FACW-</b>	<b>3</b>
<i>Barbarea vulgaris</i>	winter cress	herb	FAC	*
<i>Boehmeria cylindrica</i>	false nettle	herb	OBL	3
<b><i>Boltonia asteroides</i></b>	<b>false aster</b>	<b>herb</b>	<b>FACW</b>	<b>5</b>
<i>Callitriche heterophylla</i>	large water starwort	herb	OBL	5
<i>Campsis radicans</i>	trumpet creeper	shrub, herb	FAC	2
<i>Carex annectens</i>	large yellow fox sedge	herb	FACW	3
<i>Carex caroliniana</i>	short-scaled green sedge	herb	FAC	7
<i>Carex festucacea</i>	fescue oval sedge	herb	FAC	6
<i>Carex hyalinolepis</i>	southern lake sedge	herb	OBL	4
<i>Carex muskingumensis</i>	swamp oval sedge	herb	OBL	6
<i>Carex shortiana</i>	Short's sedge	herb	FACW+	4
<i>Carex squarrosa</i>	narrow-leaved cattail sedge	herb	OBL	5
<i>Carex tribuloides</i>	awl-fruited oval sedge	herb	FACW+	3
<i>Carex vulpinoidea</i>	fox sedge	herb	OBL	3
<i>Celtis occidentalis</i>	hackberry	herb	FAC-	3
<i>Cephalanthus occidentalis</i>	buttonbush	sapling/shrub	OBL	4
<i>Crataegus viridis</i>	green thorn	shrub, herb	FACW	5
<i>Cyperus strigosus</i>	straw-colored flatsedge	herb	FACW	0
<i>Diodia virginiana</i>	large buttonweed	herb	FACW	4
<i>Diospyros virginiana</i>	persimmon	sapling/shrub	FAC	2
<b><i>Echinochloa muricata</i></b>	<b>barnyard grass</b>	<b>herb</b>	<b>OBL</b>	<b>0</b>
<i>Eclipta prostrata</i>	yerba de tajo	herb	FACW	2
<i>Eleocharis acicularis</i>	needle spike rush	herb	OBL	3
<i>Eleocharis erythropoda</i>	red-rooted spikerush	herb	OBL	3
<i>Eleocharis obtusa</i>	blunt spike rush	herb	OBL	2
<i>Eleocharis verrucosa</i>	slender spike rush	herb	OBL	6
<i>Fraxinus pennsylvanica</i>	green ash	shrub, herb	FACW	2
<i>Galium tinctorium</i>	stiff bedstraw	herb	OBL	6
<i>Hibiscus lasiocarpus</i>	hairy rose mallow	herb	FACW+	5
<i>Ilex decidua</i>	swamp holly	shrub	FACW	6
<i>Iris</i> sp. (cultivated)	iris	herb	----	*

**Species list continues on the following page . . .**

## Site 1B – Emergent Pond/Wet Meadow continued

### SPECIES LIST (Dominant species and strata indicated by bold.)

Scientific name	Common name	Stratum	Wetland indicator status	Coefficient of conservatism
<i>Iva annua</i>	marsh elder	herb	FAC	0
<i>Juncus effusus solutus</i>	common rush	herb	OBL	4
<i>Juncus nodatus</i>	stout rush	herb	OBL	6
<i>Lespedeza cuneata</i>	sericea lespedeza	herb	NI	*
<i>Lindernia dubia</i>	false pimpernel	herb	OBL	5
<i>Liquidambar styraciflua</i>	sweet gum	shrub, herb	FACW	6
<i>Lonicera japonica</i>	Japanese honeysuckle	w-vine, herb	FACU	*
<i>Ludwigia palustris americana</i>	marsh purslane	herb	OBL	4
<i>Nyssa sylvatica</i>	black gum	herb	FAC	7
<i>Panicum clandestinum</i>	deer-tongue grass	herb	FACW	4
<i>Panicum dichotomiflorum</i>	fall panicum	herb	FACW-	0
<i>Panicum implicatum</i>	old field panic grass	herb	FAC	2
<i>Panicum rigidulum</i>	munro grass	herb	FACW	6
<i>Panicum virgatum</i>	prairie switchgrass	herb	FAC+	4
<i>Passiflora incarnata</i>	large passion-flower	herb	FACU	3
<i>Penthorum sedoides</i>	ditch stonecrop	herb	OBL	2
<i>Phyllanthus carolinensis</i>	phyllanthus	herb	FAC	5
<i>Polygonum hydropiperoides</i>	mild water pepper	herb	OBL	4
<i>Polygonum pennsylvanicum</i>	giant smartweed	herb	FACW+	1
<i>Polygonum punctatum</i>	dotted smartweed	herb	OBL	3
<i>Populus deltoides</i>	eastern cottonwood	shrub, herb	FAC+	2
<i>Potentilla simplex</i>	common cinquefoil	herb	FACU-	3
<i>Pycnanthemum tenuifolium</i>	slender mountain mint	herb	FAC	4
<i>Quercus bicolor</i>	swamp white oak	herb	FACW+	7
<i>Quercus pagoda</i>	cherrybark oak	shrub	FAC	5
<i>Quercus palustris</i>	pin oak	sapling/shrub, herb	FACW	4
<i>Rorippa islandica</i>	marsh yellow cress	herb	OBL	4
<i>Rosa multiflora</i>	multiflora rose	shrub	FACU	*
<i>Rosa setigera</i>	Illinois rose	shrub	FACU+	5
<i>Rotala ramosior</i>	tooth-cup	herb	OBL	4
<i>Rubus pensilvanicus</i>	blackberry	shrub	FAC-	2
<i>Rumex crispus</i>	curly dock	herb	FAC+	*
<i>Salix nigra</i>	black willow	sapling/shrub, herb	OBL	3
<i>Scirpus atrovirens</i>	dark green bulrush	herb	OBL	4
<i>Scirpus cyperinus</i>	wool grass	herb	OBL	5
<i>Senecio glabellus</i>	butterweed	herb	OBL	0
<i>Setaria faberi</i>	giant foxtail	herb	FACU+	*
<i>Sida spinosa</i>	prickly sida	herb	FACU	*
<i>Smilax rotundifolia</i>	cat briers	vine	FAC	4
<i>Solidago canadensis</i>	Canada goldenrod	herb	FACU	1
♠ <i>Taxodium distichum</i>	bald cypress	sapling/shrub	OBL	7
<i>Teucrium canadense</i>	American germander	herb	FACW-	3
<i>Toxicodendron radicans</i>	poison ivy	shrub, herb	FAC+	1
<i>Ulmus americana</i>	American elm	shrub, herb	FACW-	5
<i>Verbesina alternifolia</i>	wingstem	herb	FACW	4
<i>Vernonia gigantea</i>	tall iron weed	herb	FAC	4

*Species list continues on the following page . . .*

### Site 1B – Emergent Pond/Wet Meadow continued

#### SPECIES LIST (Dominant species and strata indicated by bold.)

Scientific name	Common name	Stratum	Wetland indicator status	Coefficient of conservatism
<i>Veronica peregrina</i>	purslane speedwell	herb	FACW+	0
<i>Vitis cinerea</i>	winter grape	w-vine	FACW-	4
<i>Xanthium strumarium</i>	cocklebur	herb	FAC	0
* Non-native species				mCv = 3.4
φ Planted				FQI = $\sum C/31.8$

## Site 2 – Wet Meadow

### SPECIES LIST (Dominant species and strata indicated by bold.)

Scientific name	Common name	Stratum	Wetland indicator status	Coefficient of conservatism
<i>Acer negundo</i>	box elder	herb	FACW-	1
<i>Acer rubrum</i>	red maple	herb	FAC	5
<i>Achillea millefolium</i>	common milfoil	herb	FACU	*
<i>Agrostis alba</i>	red top	herb	FACW	0
<i>Alisma plantago-aquatica</i>	broad-leaf water-plantain	herb	OBL	2
<i>Ambrosia artemisiifolia</i>	common ragweed	herb	FACU	0
<i>Ambrosia trifida</i>	giant ragweed	herb	FAC+	0
<i>Andropogon virginicus</i>	broom sedge	herb	FAC-	1
<i>Aster ontarionis</i>	Ontario aster	herb	FAC	4
<i>Aster pilosus</i>	hairy aster	herb	FACU+	0
<i>Aster simplex</i>	panicled aster	herb	FACW	3
<b><i>Aster vimineus</i></b>	<b>frost flower</b>	<b>herb</b>	<b>FACW-</b>	<b>3</b>
<i>Barbarea vulgaris</i>	winter cress	herb	FAC	*
<i>Boltonia asteroides</i>	false aster	herb	FACW	5
<i>Callitriche terrestris</i>	terrestrial starwort	herb	FACU	2
<i>Campsis radicans</i>	trumpet creeper	w-vine, shrub, herb	FAC	2
<i>Carex annectens</i>	large yellow fox sedge	herb	FACW	3
<i>Carex caroliniana</i>	short-scaled green sedge	herb	FAC	7
<i>Carex crinita</i>	fringed sedge	herb	OBL	8
<i>Carex festucacea</i>	fescue oval sedge	herb	FAC	6
<i>Carex granularis</i>	meadow sedge	herb	FACW+	2
<i>Carex lurida</i>	bottlebrush sedge	herb	OBL	7
<i>Carex shortiana</i>	Short's sedge	herb	FACW+	4
<i>Carex tribuloides</i>	awl-fruited oval sedge	herb	FACW+	3
<i>Carex vulpinoidea</i>	fox sedge	herb	OBL	3
<i>Cerastium vulgatum</i>	common mouse-ear chickweed	herb	FACU	*
<i>Cyperus pseudovegetus</i>	false green flat sedge	herb	FACW	5
<i>Cyperus strigosus</i>	straw-colored flatsedge	herb	FACW	0
<i>Echinochloa muricata</i>	barnyard grass	herb	OBL	0
<i>Eleocharis erythropoda</i>	red-rooted spikerush	herb	OBL	3
<i>Eleocharis verrucosa</i>	slender spike rush	herb	OBL	6
<i>Erigeron philadelphicus</i>	marsh fleabane	herb	FACW	3
<i>Eupatorium perfoliatum</i>	common boneset	herb	FACW+	4
<i>Festuca arundinacea</i>	tall fescue	herb	FACU+	*
<i>Fraxinus pennsylvanica</i>	green ash	shrub, herb	FACW	2
<i>Gratiola neglecta</i>	clammy hedge hyssop	herb	OBL	5
<i>Iva annua</i>	marsh elder	herb	FAC	0
<i>Juncus acuminatus</i>	knotty-leaved rush	herb	OBL	4
<i>Juncus diffusissimus</i>	rush	herb	FACW	7
<i>Juncus effusus solutus</i>	common rush	herb	OBL	4
<i>Juncus interior</i>	inland rush	herb	FAC+	3
<i>Juncus marginatus</i>	grass-leaved rush	herb	FACW	5
<b><i>Juncus nodatus</i></b>	<b>stout rush</b>	<b>herb</b>	<b>OBL</b>	<b>6</b>
<i>Juncus torreyi</i>	Torrey's rush	herb	FACW	3
<i>Leersia oryzoides</i>	rice cutgrass	herb	OBL	3
<i>Lespedeza cuneata</i>	sericea lespedeza	herb	NI	*

*Species list continues on the following page . . .*

## Site 2 – Wet Meadow continued

### SPECIES LIST (Dominant species and strata indicated by bold.)

Scientific name	Common name	Stratum	Wetland indicator status	Coefficient of conservatism
<i>Lindernia dubia</i>	false pimpernel	herb	OBL	5
<i>Ludwigia alternifolia</i>	seedbox	herb	OBL	5
<i>Ludwigia glandulosa</i>	false loosestrife	herb	OBL	8
<i>Ludwigia polycarpa</i>	false loosestrife	herb	OBL	5
<i>Melilotus</i> sp.	sweet clover	herb	FACU	*
<i>Panicum clandestinum</i>	deer-tongue grass	herb	FACW	4
<i>Panicum implicatum</i>	old field panic grass	herb	FAC	2
<i>Panicum virgatum</i>	prairie switchgrass	herb	FAC+	4
<i>Phalaris arundinacea</i>	reed canary grass	herb	FACW+	*
<i>Poa pratensis</i>	Kentucky bluegrass	herb	FAC-	*
<i>Potentilla simplex</i>	common cinquefoil	herb	FACU-	3
<i>Pycnanthemum tenuifolium</i>	slender mountain mint	herb	FAC	4
φ <i>Quercus bicolor</i>	swamp white oak	herb	FACW+	7
<i>Quercus pagoda</i>	cherrybark oak	herb	FAC	5
<i>Quercus palustris</i>	pin oak	herb	FACW	4
<i>Ranunculus sardous</i>	buttercup	herb	FAC	*
<i>Ranunculus sceleratus</i>	cursed crowfoot	herb	OBL	3
<i>Rumex crispus</i>	curly dock	herb	FAC+	*
<i>Salix nigra</i>	black willow	shrub	OBL	3
<i>Scirpus atrovirens</i>	dark green bulrush	herb	OBL	4
<i>Scirpus cyperinus</i>	wool grass	herb	OBL	5
<i>Scirpus pendulus</i>	red bulrush	herb	OBL	3
<i>Senecio glabellus</i>	butterweed	herb	OBL	0
<i>Setaria glauca</i>	pigeon grass	herb	FAC	*
<i>Sisyrinchium angustifolium</i>	common blue-eyed grass	herb	FACW-	5
<i>Solanum carolinense</i>	horse nettle	herb	FACU-	0
<i>Solidago canadensis</i>	Canada goldenrod	herb	FACU	1
φ <i>Taxodium distichum</i>	bald cypress	sapling/shrub, herb	OBL	7
<i>Toxicodendron radicans</i>	poison ivy	shrub	FAC+	1
<i>Trifolium hybridum</i>	Alsike clover	herb	FAC-	*
<i>Trifolium pratense</i>	red clover	herb	FACU+	*
<i>Typha angustifolia</i>	narrow-leaved cattail	herb	OBL	*
<i>Typha latifolia</i>	cattail	herb	OBL	1
<i>Ulmus americana</i>	American elm	herb	FACW-	5
<i>Valerianella radiata</i>	corn salad	herb	FAC+	1
<i>Veronica peregrina</i>	purslane speedwell	herb	FACW+	0
<i>Vicia villosa</i>	winter vetch	herb	UPL	*

\* Non-native species

φ Planted

mCv = 3.4

FQI =  $\sum C/27.8$

### Site 3 – Emergent Pond

#### SPECIES LIST (Dominant species and strata indicated by bold.)

Scientific name	Common name	Stratum	Wetland indicator status	Coefficient of conservatism
<i>Acalypha rhomboidea</i>	three-seeded mercury	herb	FACU	0
<i>Acalypha virginica</i>	three-seeded mercury	herb	FACU	2
<i>Acer negundo</i>	box elder	shrub, herb	FACW-	1
<i>Acorus calamus</i>	sweetflag	herb	OBL	4
<i>Agrostis alba</i>	red top	herb	FACW	0
<i>Alopecurus carolinianus</i>	annual foxtail	herb	FACW	0
<i>Ambrosia artemisiifolia</i>	common ragweed	herb	FACU	0
<i>Ammannia coccinea</i>	long-leaved ammannia	herb	OBL	5
<i>Andropogon virginicus</i>	broom sedge	herb	FAC-	1
<i>Aster ontarionis</i>	Ontario aster	herb	FAC	4
<i>Aster pilosus</i>	hairy aster	herb	FACU+	0
<i>Aster praealtus</i>	willow-leaved aster	herb	FACW	4
<i>Aster simplex</i>	panicled aster	herb	FACW	3
<b><i>Aster vimineus</i></b>	<b>frost flower</b>	<b>herb</b>	<b>FACW-</b>	<b>3</b>
<i>Barbarea vulgaris</i>	winter cress	herb	FAC	*
<i>Bidens aristosa</i>	swamp marigold	herb	FACW	1
<b><i>Boltonia asteroides</i></b>	<b>false aster</b>	<b>herb</b>	<b>FACW</b>	<b>5</b>
<i>Bromus tectorum</i>	cheat grass brome	herb	UPL	*
<i>Campsis radicans</i>	trumpet creeper	shrub, herb	FAC	2
<i>Carex annectens</i>	large yellow fox sedge	herb	FACW	3
<i>Carex caroliniana</i>	short-scaled green sedge	herb	FAC	7
<i>Carex cephalophora</i>	short-headed bracted sedge	herb	FACU	3
<i>Carex frankii</i>	Frank's sedge	herb	OBL	4
<i>Carex granularis</i>	meadow sedge	herb	FACW+	2
<i>Carex hyalinolepis</i>	southern lake sedge	herb	OBL	4
<i>Carex shortiana</i>	Short's sedge	herb	FACW+	4
<i>Carex tribuloides</i>	awl-fruited oval sedge	herb	FACW+	3
<i>Carex vulpinoidea</i>	fox sedge	herb	OBL	3
<i>Celtis occidentalis</i>	hackberry	shrub, herb	FAC-	3
<i>Chamaesyce humistrata</i>	milk spurge	herb	FACW	1
<i>Chamaesyce maculata</i>	nodding spurge	herb	FACU-	0
<i>Cyperus esculentus</i>	yellow nut-sedge	herb	FACW	0
<i>Cyperus pseudovegetus</i>	false flat green sedge	herb	FACW	5
<i>Daucus carota</i>	Queen Anne's lace	herb	UPL	*
<i>Desmodium dillenii</i>	tick trefoil	herb	FACU	3
<i>Desmodium paniculatum</i>	panicled tick trefoil	herb	FACU	2
<b><i>Diodia virginiana</i></b>	<b>large buttonweed</b>	<b>herb</b>	<b>FACW</b>	<b>4</b>
<i>Diospyros virginiana</i>	persimmon	shrub, herb	FAC	2
<i>Echinochloa muricata</i>	barnyard grass	herb	OBL	0
<i>Eleocharis erythropoda</i>	red-rooted spikerush	herb	OBL	3
<i>Eleocharis verrucosa</i>	slender spikerush	herb	OBL	6
<i>Elymus virginicus</i>	Virginia wild rye	herb	FACW-	4
<i>Erigeron annuus</i>	annual fleabane	herb	FAC-	1
<i>Erigeron philadelphicus</i>	marsh fleabane	herb	FACW	3
<i>Festuca arundinacea</i>	tall fescue	herb	FACU+	*
<i>Fraxinus pennsylvanica</i>	green ash	shrub, herb	FACW	2

*Species list continues on the following page . . .*

### Site 3 – Emergent Pond continued

#### SPECIES LIST (Dominant species and strata indicated by bold.)

Scientific name	Common name	Stratum	Wetland indicator status	Coefficient of conservatism
<i>Galium tinctorium</i>	stiff bedstraw	herb	OBL	6
<i>Ipomoea hederacea</i>	ivy-leaved morning glory	herb	FAC	*
<i>Ipomoea lacunosa</i>	small white morning-glory	herb	FACW	1
<i>Iris shrevei</i>	southern blue flag	herb	OBL	5
<i>Iris</i> sp. (cultivated)	iris	herb	----	*
<i>Iva annua</i>	marsh elder	herb	FAC	0
<i>Juncus acuminatus</i>	knotty-leaved rush	herb	OBL	4
<i>Juncus dudleyi</i>	Dudley's rush	herb	FAC	4
<i>Juncus effusus solutus</i>	common rush	herb	OBL	4
<b><i>Juncus nodatus</i></b>	<b>stout rush</b>	<b>herb</b>	<b>OBL</b>	<b>6</b>
<i>Juncus torreyi</i>	Torrey's rush	herb	FACW	3
<i>Krigia caespitosa</i>	dwarf dandelion	herb	FAC-	1
<i>Kummerowia striata</i>	Japanese lespedeza	herb	FACU	*
<i>Lathyrus latifolius</i>	everlasting pea	herb	UPL	*
<i>Lespedeza cuneata</i>	sericea lespedeza	herb	NI	*
<i>Lindernia dubia</i>	false pimpernel	herb	OBL	5
<i>Ludwigia glandulosa</i>	false loosestrife	herb	OBL	8
<i>Ludwigia palustris americana</i>	marsh purslane	herb	OBL	4
<i>Ludwigia peploides glabrescens</i>	creeping primrose willow	herb	OBL	5
<i>Melilotus</i> sp.	sweet clover	herb	FACU	*
<i>Myosotis verna</i>	scorpion grass	herb	FAC-	3
<i>Panicum virgatum</i>	prairie switchgrass	herb	FAC+	4
<i>Paspalum laeve</i>	smooth lens grass	herb	UPL	2
<i>Passiflora incarnata</i>	large passion-flower	vine, herb	FACU	3
<i>Phyla lanceolata</i>	fog-fruit	herb	OBL	1
<i>Pluchea camphorata</i>	camphor weed	herb	FACW	7
<i>Poa pratensis</i>	Kentucky bluegrass	herb	FAC-	*
<i>Polygonum hydropiperoides</i>	mild water pepper	herb	OBL	4
<i>Polygonum pensylvanicum</i>	giant smartweed	herb	FACW+	1
<i>Polygonum punctatum</i>	dotted smartweed	herb	OBL	3
<i>Pontederia cordata</i>	pickerelweed	herb	OBL	8
<i>Populus heterophylla</i>	swamp cottonwood	shrub	OBL	8
<i>Potentilla simplex</i>	common cinquefoil	herb	FACU-	3
<i>Pycnanthemum tenuifolium</i>	slender mountain mint	herb	FAC	4
<i>Pycnanthemum virginianum</i>	common mountain mint	herb	FACW+	5
φ <i>Quercus bicolor</i>	swamp white oak	shrub, herb	FACW+	7
φ <i>Quercus lyrata</i>	overcup oak	shrub, herb	OBL	7
<i>Ranunculus laxicaulis</i>	spearwort	herb	OBL	6
<i>Ranunculus sardous</i>	buttercup	herb	FAC	*
<i>Rorippa sessiliflora</i>	sessile-flowered cress	herb	OBL	3
<i>Rosa multiflora</i>	multiflora rose	shrub	FACU	*
<i>Rumex altissimus</i>	pale dock	herb	FACW-	2
<i>Rumex crispus</i>	curly dock	herb	FAC+	*
<i>Salix nigra</i>	black willow	shrub, herb	OBL	3
<i>Scirpus atrovirens</i>	dark green bulrush	herb	OBL	4
<i>Scirpus cyperinus</i>	wool grass	herb	OBL	5

**Species list continues on the following page . . . .**

### Site 3 – Emergent Pond continued

#### SPECIES LIST (Dominant species and strata indicated by bold.)

Scientific name	Common name	Stratum	Wetland indicator status	Coefficient of conservatism
<i>Scirpus pendulus</i>	red bulrush	herb	OBL	3
<i>Senecio glabellus</i>	butterweed	herb	OBL	0
<i>Sida spinosa</i>	prickly sida	herb	FACU	*
<i>Sisyrinchium angustifolium</i>	common blue-eyed grass	herb	FACW-	5
<i>Solanum carolinense</i>	horse nettle	herb	FACU-	0
<i>Solidago canadensis</i>	Canada goldenrod	herb	FACU	1
ϕ <i>Taxodium distichum</i>	bald cypress	shrub, herb	OBL	7
<i>Toxicodendron radicans</i>	poison ivy	herb	FAC+	1
<i>Trifolium hybridum</i>	Alsike clover	herb	FAC-	*
<i>Trifolium pratense</i>	red clover	herb	FACU+	*
<i>Typha angustifolia</i>	narrow-leaved cattail	herb	OBL	*
<i>Typha latifolia</i>	cattail	herb	OBL	1
<i>Ulmus americana</i>	American elm	shrub, herb	FACW-	5
<i>Valerianella radiata</i>	corn salad	herb	FAC+	1
<i>Veronica peregrina</i>	purslane speedwell	herb	FACW+	0
<i>Vicia villosa</i>	winter vetch	herb	UPL	*
<i>Xanthium strumarium</i>	cocklebur	herb	FAC	0

\* Non-native species

mCv = 3.1

ϕ Planted

FQI =  $\sum C/29.5$

### Site 4 – Shrubland (proposed Floodplain Forest)

#### SPECIES LIST (Dominant species and strata indicated by bold.)

Scientific name	Common name	Stratum	Wetland indicator status	Coefficient of conservatism
<i>Acalypha ostryaefolia</i>	three-seeded mercury	herb	UPL	1
<i>Acalypha rhomboidea</i>	three-seeded mercury	sapling/shrub, herb	FACU	0
<i>Acer negundo</i>	box elder	sapling/shrub, herb	FACW-	1
<i>Acer rubrum</i>	red maple	herb	FAC	5
<i>Achillea millefolium</i>	common milfoil	herb	FACU	*
<i>Agrostis alba</i>	red top	herb	FACW	0
<i>Allium sativum</i>	garlic	herb	UPL	*
<i>Ambrosia artemisiifolia</i>	common ragweed	herb	FACU	0
<i>Ambrosia trifida</i>	giant ragweed	herb	FAC+	0
<i>Andropogon virginicus</i>	broom sedge	herb	FAC-	1
<i>Apocynum cannabinum</i>	dogbane	herb	FAC	2
<i>Artemisia vulgaris</i>	common mugwort	herb	UPL	*
<i>Asclepias syriaca</i>	common milkweed	herb	UPL	0
<i>Asimina triloba</i>	paw-paw	shrub	FAC	4
<i>Aster ontarionis</i>	Ontario aster	herb	FAC	4
<i>Aster pilosus</i>	hairy aster	herb	FACU+	0
<i>Aster praealtus</i>	willow-leaved aster	herb	FACW	4
<i>Aster simplex</i>	panicled aster	herb	FACW	3
<i>Aster vimineus</i>	frost flower	herb	FACW-	3
<i>Barbarea vulgaris</i>	winter cress	herb	FAC	*
<i>Bromus commutatus</i>	hairy brome	herb	UPL	*
<b><i>Campsis radicans</i></b>	<b>trumpet creeper</b>	w-vine, shrub, <b>herb</b>	<b>FAC</b>	<b>2</b>
<i>Carex annectens</i>	large yellow fox sedge	herb	FACW	3
<i>Carex blanda</i>	woodland sedge	herb	FAC	2
<i>Carex caroliniana</i>	short-scaled green sedge	herb	FAC	7
<i>Carex cephalophora</i>	short-headed bracted sedge	herb	FACU	3
<i>Carex festucacea</i>	fescue oval sedge	herb	FAC	6
<i>Carex granularis</i>	meadow sedge	herb	FACW+	2
<i>Centaurea cyanus</i>	bachelor's button	herb	UPL	*
<i>Cerastium vulgatum</i>	common mouse-ear chickweed	herb	FACU	*
<i>Chamaesyce maculata</i>	nodding spurge	herb	FACU-	0
<i>Chenopodium album</i>	lamb's quarters	herb	FAC-	*
<i>Cirsium discolor</i>	pasture thistle	herb	UPL	3
<i>Cocculus carolinus</i>	snailseed	w-vine	FAC	6
<i>Conyza canadensis</i>	horseweed	herb	FAC-	0
<i>Cynanchum laeve</i>	blue vine	herb	FAC	1
<i>Dactylis glomerata</i>	orchard grass	herb	FACU	*
<i>Daucus carota</i>	Queen Anne's lace	herb	UPL	*
<i>Desmodium dillenii</i>	tick trefoil	herb	FACU	3
<i>Desmodium paniculatum</i>	panicled tick trefoil	herb	FACU	2
<i>Diospyros virginiana</i>	persimmon	shrub, herb	FAC	2
<i>Echinochloa muricata</i>	barnyard grass	herb	OBL	0
<i>Elymus canadensis</i>	Canada wild rye	herb	FAC-	4
<i>Elymus virginicus</i>	Virginia wild rye	herb	FACW-	4
<i>Erigeron annuus</i>	annual fleabane	herb	FAC-	1
<i>Erigeron philadelphicus</i>	marsh fleabane	herb	FACW	3

*Species list continues on the following page . . .*

### Site 4 – Shrubland (proposed Floodplain Forest) continued

#### SPECIES LIST (Dominant species and strata indicated by bold.)

Scientific name	Common name	Stratum	Wetland indicator status	Coefficient of conservatism
<i>Eupatorium coelestinum</i>	blue bonset	herb	FAC+	3
<i>Eupatorium perfoliatum</i>	common boneset	herb	FACW+	4
<i>Festuca arundinacea</i>	tall fescue	herb	FACU+	*
ϕ <i>Fraxinus pennsylvanica</i>	green ash	sapling/shrub	FACW	2
<i>Galium aparine</i>	annual bedstraw	herb	FACU	0
<i>Geranium carolinianum</i>	wild cranesbill	herb	UPL	2
<i>Gleditsia triacanthos</i>	honey locust	shrub, herb	FAC	2
<i>Gnaphalium obtusifolium</i>	catfoot	herb	UPL	2
<i>Hemerocallis fulva</i>	day lily	herb	UPL	*
<i>Iva annua</i>	marsh elder	herb	FAC	0
<i>Juncus effusus solutus</i>	common rush	herb	OBL	4
<i>Juncus tenuis</i>	path rush	herb	FAC	0
<i>Juniperus virginiana</i>	eastern red cedar	tree	FACU	1
<i>Krigia caespitosa</i>	dwarf dandelion	herb	FAC-	1
<i>Kummerowia striata</i>	Japanese lespedeza	herb	FACU	*
<b><i>Lespedeza cuneata</i></b>	<b>sericea lespedeza</b>	<b>herb</b>	<b>NI</b>	<b>*</b>
ϕ <i>Liquidambar styraciflua</i>	sweet gum	sapling/shrub, herb	FACW	6
<i>Lonicera japonica</i>	Japanese honeysuckle	w-vine, herb	FACU	*
<i>Medicago lupulina</i>	black medic	herb	FAC-	*
<i>Melilotus alba</i>	white sweet clover	herb	FACU	*
<i>Melilotus officinalis</i>	yellow sweet clover	herb	FACU	*
<i>Myosotis verna</i>	scorpion grass	herb	FAC-	3
<i>Ornithogalum umbellatum</i>	common star-of-Bethlehem	herb	FAC-	*
<i>Oxalis stricta</i>	yellow wood sorrel	herb	FACU	0
<i>Panicum anceps</i>	panic grass	herb	FACW	3
<i>Panicum clandestinum</i>	deer-tongue grass	herb	FACW	4
<b><i>Panicum virgatum</i></b>	<b>prairie switchgrass</b>	<b>herb</b>	<b>FAC+</b>	<b>4</b>
<i>Paspalum laeve</i>	smooth lens grass	herb	UPL	2
<i>Passiflora incarnata</i>	large passion-flower	vine	FACU	3
<i>Penstemon digitalis</i>	foxglove beard-tongue	herb	FAC-	4
<i>Phalaris arundinacea</i>	reed canary grass	herb	FACW+	*
<i>Phytolacca americana</i>	pokeweed	herb	FAC-	1
ϕ <i>Platanus occidentalis</i>	sycamore	tree, sapling/shrub	FACW	3
<i>Poa pratensis</i>	Kentucky bluegrass	herb	FAC-	*
<i>Polygonum pensylvanicum</i>	giant smartweed	herb	FACW+	1
<i>Prunus serotina</i>	wild black cherry	herb	FACU	1
<i>Pycnanthemum tenuifolium</i>	slender mountain mint	herb	FAC	4
<i>Pyrus calleryana</i>	ornamental pear	sapling	UPL	*
ϕ <i>Quercus bicolor</i>	<b>swamp white oak</b>	<b>sapling/shrub, herb</b>	<b>FACW+</b>	<b>7</b>
ϕ <i>Quercus lyrata</i>	<b>overcup oak</b>	<b>sapling, herb</b>	<b>OBL</b>	<b>7</b>
<i>Quercus pagoda</i>	cherrybark oak	sapling/shrub, herb	FAC	5
ϕ <i>Quercus palustris</i>	<b>pin oak</b>	<b>sapling, herb</b>	<b>FACW</b>	<b>4</b>
<i>Quercus velutina</i>	black oak	sapling/shrub	UPL	5
<i>Ranunculus sardous</i>	buttercup	herb	FAC	*
<i>Rosa multiflora</i>	multiflora rose	shrub	FACU	*
<i>Rosa setigera</i>	Illinois rose	shrub	FACU+	5

*Species list continues on the following page . . .*

### Site 4 – Shrubland (proposed Floodplain Forest) continued

#### SPECIES LIST (Dominant species and strata indicated by bold.)

Scientific name	Common name	Stratum	Wetland indicator status	Coefficient of conservatism
<i>Rubus discolor</i>	Himalaya-berry	shrub	UPL	*
<i>Rubus pensilvanicus</i>	blackberry	shrub	FAC-	2
<i>Rumex crispus</i>	curly dock	herb	FAC+	*
<i>Sassafras albidum</i>	sassafras	shrub	FACU	2
<i>Scirpus atrovirens</i>	dark green bulrush	herb	OBL	4
<i>Senecio glabellus</i>	butterweed	herb	OBL	0
<i>Setaria faberi</i>	giant foxtail	herb	FACU+	*
<i>Setaria glauca</i>	pigeon grass	herb	FAC	*
<i>Sida spinosa</i>	prickly sida	herb	FACU	*
<i>Smilax glauca</i>	greenbrier	vine, herb	FACU	6
<i>Solanum carolinense</i>	horse nettle	herb	FACU-	0
<b><i>Solidago canadensis</i></b>	<b>Canada goldenrod</b>	<b>herb</b>	<b>FACU</b>	<b>1</b>
<i>Solidago gigantea</i>	late goldenrod	herb	FACW	3
<i>Sorghum halepense</i>	Johnson grass	herb	FACU	*
<i>Taraxacum officinale</i>	common dandelion	herb	FACU	*
φ <i>Taxodium distichum</i>	bald cypress	shrub, herb	OBL	7
<i>Toxicodendron radicans</i>	poison ivy	shrub, herb	FAC+	1
<i>Tridens flavus</i>	common purple top	herb	UPL	1
<i>Trifolium campestre</i>	low hop clover	herb	UPL	*
<i>Trifolium hybridum</i>	Alsike clover	herb	FAC-	*
<i>Trifolium pratense</i>	red clover	herb	FACU+	*
<i>Trifolium repens</i>	white clover	herb	FACU+	*
<i>Ulmus americana</i>	American elm	shrub, herb	FACW-	5
<i>Ulmus pumila</i>	Siberian elm	sapling	UPL	*
<i>Ulmus rubra</i>	slippery elm	sapling/shrub	FAC	3
<i>Valerianella radiata</i>	corn salad	herb	FAC+	1
<i>Verbesina alternifolia</i>	wingstem	herb	FACW	4
<i>Verbesina helianthoides</i>	yellow crownbeard	herb	UPL	6
<i>Veronica arvensis</i>	corn speedwell	herb	UPL	*
<i>Veronica peregrina</i>	purslane speedwell	herb	FACW+	0
<i>Vernonia gigantea</i>	tall iron weed	herb	FAC	4
<i>Vicia villosa</i>	winter vetch	herb	UPL	*
<i>Vitis riparia</i>	riverbank grape	w-vine, herb	FACW-	2
<i>Xanthium strumarium</i>	cocklebur	herb	FAC	0

\* Non-native species

φ Planted

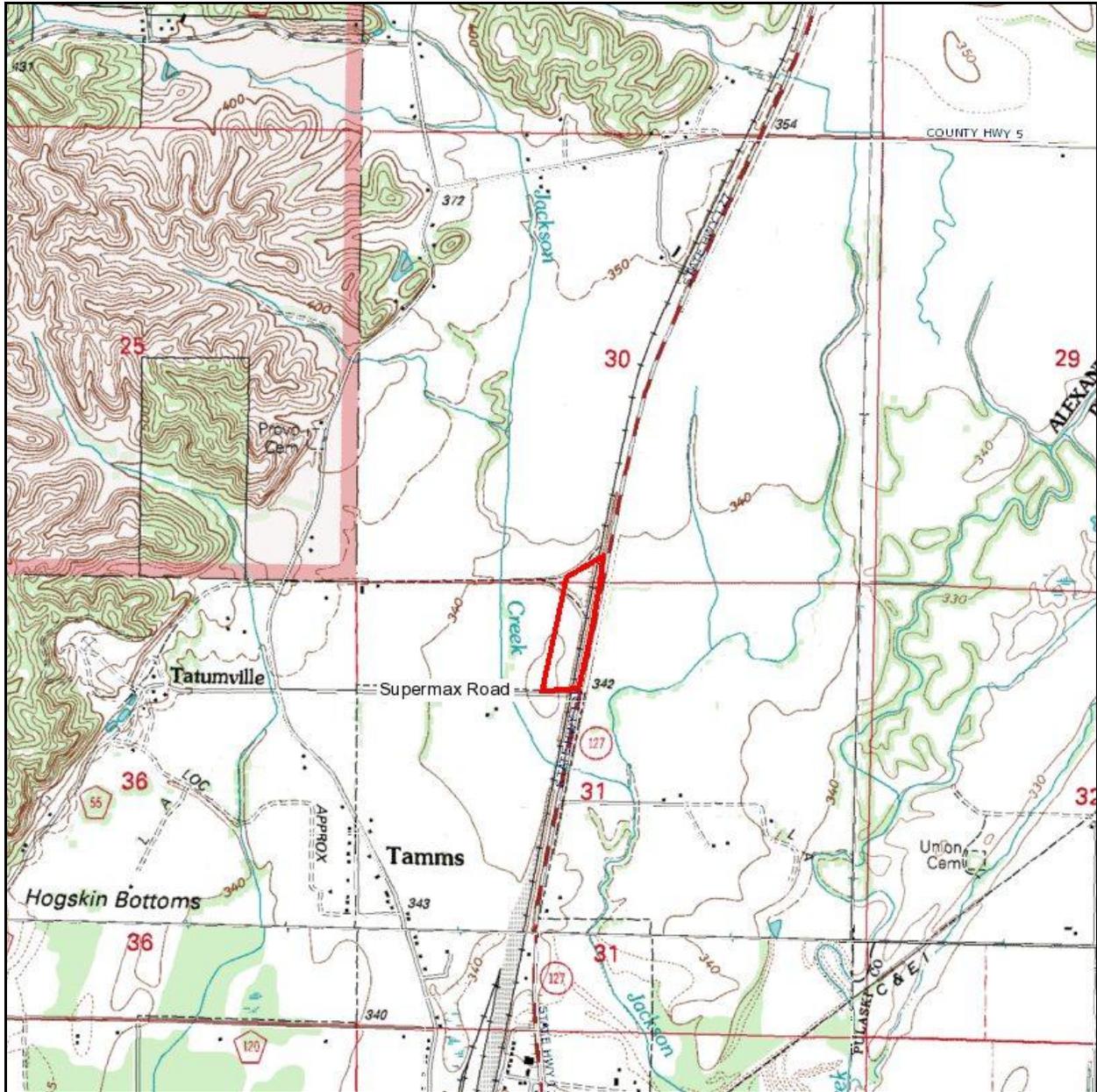
mCv = 2.6

FQI =  $\sum C/24.2$

**APPENDIX C**

**Figures**

**Figure 1 – Project Location Map ..... 54**  
**Figure 2 – ISGS Wetland Hydrology Map ..... 55**  
**Figure 3 – Wetland Delineation Map ..... 56**



**Figure 1. Project location map for the Tamms Wetland Mitigation Site (FAS 1907 [IL 127]), Alexander County, Illinois.**

## Tamms Wetland Mitigation Site (IL 127, FAS 1907)

### Estimated Areal Extent of 2011 Wetland Hydrology September 1, 2010 through August 31, 2011

Map based on National Agricultural Imagery Program (NAIP) digital orthophotograph,  
Mill Creek SE quarter quadrangle, taken July 1, 2010 (USDA-FSA 2010) and ISGS topography.

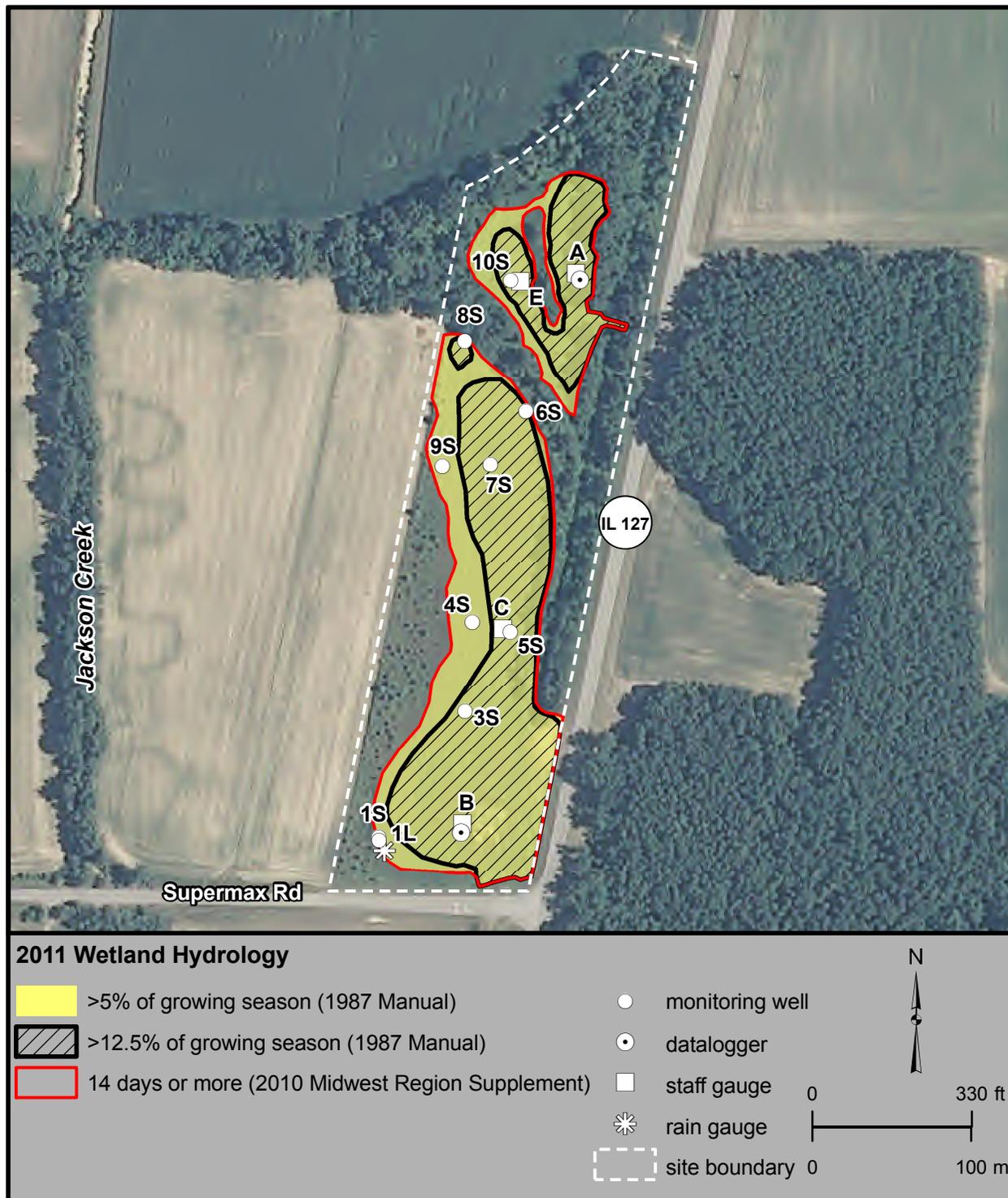
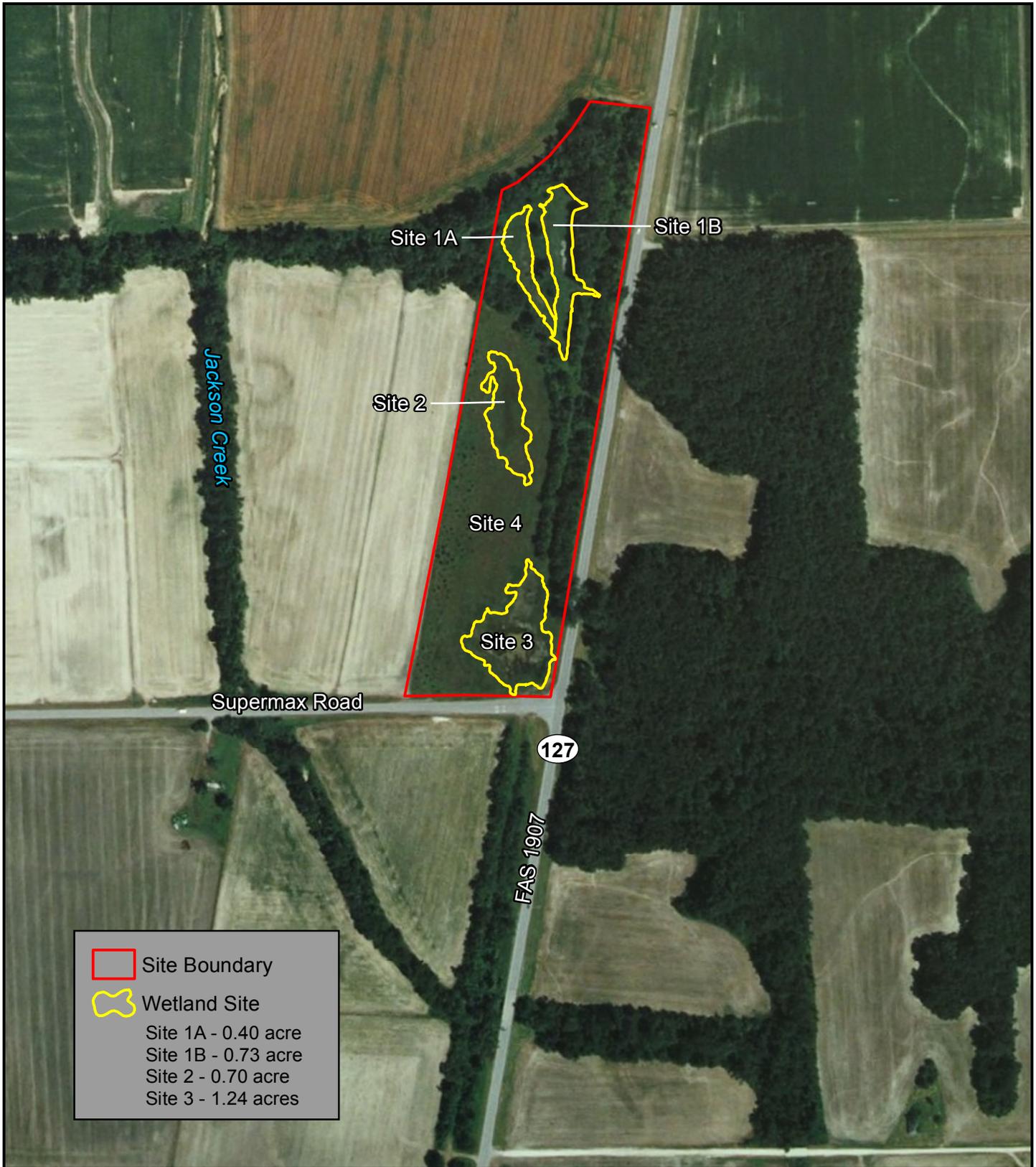


Figure 2. 2011 aerial extent of wetland hydrology for FAS 1907 (IL 127) wetland monitoring site (prepared by ISGS; Pociask and Monson 2011; Miner et al. 2011). Note that this area differs significantly from Figure 3 which depicts the aerial extent of the three created wetland sites.



	Site Boundary
	Wetland Site
	Site 1A - 0.40 acre
	Site 1B - 0.73 acre
	Site 2 - 0.70 acre
	Site 3 - 1.24 acres



UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN  
**Wetland Science Program**  
 Illinois Natural History Survey  
 Prairie Research Institute  
 1816 South Oak Street  
 Champaign, Illinois 61820

**Tamms Mitigation Monitoring Site**  
**IL Route 127 (FAS 1907)**  
**Alexander County**

Seq. No: 1026

0 Meters 100  
 1 : 4,800

0 Feet 400  
 1 inch : 400 feet

01/2012  
 Figure 3



Estimated aerial extent of the created wetland sites at the FAS 1907 (IL 127) Tamms Wetland Monitoring Site. Alexander County, Illinois.

**APPENDIX D**

**Wetland Determination Site Photos**

<b>Figure 1 - Site 1A (Wet Meadow) Photos .....</b>	<b>58</b>
<b>Figure 1 - Site 1B (Emergent Pond/Wet Meadow) Photos .....</b>	<b>59</b>
<b>Figure 1 - Site 2 (Wet Meadow) Photos .....</b>	<b>60</b>
<b>Figure 1 - Site 3 (Emergent Pond) Photos .....</b>	<b>61</b>
<b>Figure 1 - Site 4 (Shrubland, proposed Floodplain Forest) Photos .....</b>	<b>62</b>



A.



B.



C.

**Figure 1. Site 1A  
Wet Meadow**

**A. View from near the south end of the site looking north (September 11, 2011).**

**B. View from the near the north end of the site looking south (May 10, 2011).**

**C. View from near the center of the site looking south (May 10, 2011).**

**D. *Ludwigia glandulosa* (false loosestrife) at Site 1A.**



D.



A.



B.



C.

**Figure 2. Site 1B  
Wet Meadow/Emergent  
Pond**

**A. View from the south end  
of the site looking north  
(May 10, 2011).**

**B. View from the south end  
of the site looking north  
(September 11, 2011).**

**C. View from the north end  
of the site looking south  
(May 10, 2010).**

**D. *Callitriche heterophylla*  
(large water starwort) at  
Site 1B.**



D.



A.

**Figure 3. Site 2  
Wet Meadow**

**A. View from near the north end of the site looking south/southeast (May 10, 2011).**

**B. View from near the north end of the site looking south/southeast (September 10, 2011).**

**C. *Carex shortiana* (Short's sedge) at Site 2.**



B.



C.



A.



B.

**Figure 4. Site 3  
Emergent Pond w/fringe**

**A. View from the culvert at  
Supermax Road looking  
north (May 10, 2011).**

**B. View from the culvert at  
Supermax Road looking  
north (September 10,  
2011).**

**C. *Populus heterophylla*  
(swamp cottonwood) at  
Site 3.**



C.



A.



B.



C.

**Figure 5. Site 4  
Shrubland (proposed  
floodplain forest)**

**A. View from Site 2 looking to the northeast (September 10, 2010). Note the abundance of *Solidago canadensis* (Canada Goldenrod).**

**B. Habitat photo of *Sorghum halepense* (Johnson Grass) growing around the perimeter of Site 4 (September 28, 2010).**

**C. Habitat photo of *Lespedeza cuneata* (Sericea Lespedeza) growing around the perimeter of Site 3 (September 28, 2010).**

**D. Close-up photo of *Lespedeza cuneata* (Sericea Lespedeza) in flower.**



D.