Wetland Mitigation Monitoring for the La Grange Mitigation Bank Site, Areas 1, 2, 3, 5, 6 and 8 - 2010

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Introduction

In 2004, the Illinois Department of Transportation (IDOT) established the La Grange Wetland Mitigation Bank in Brown Co., IL (legal location: T. 1 S., R. 1 W., Sect. 16, 17, 20, 21) (Watson et al. 2004). This site, at the confluence of the Illinois and La Moine Rivers, occupies 665 ha (1643 acres), primarily comprising low agricultural fields with some previously existing upland forest, forested wetland, marsh, wet meadow and backwater lakes. Topographically, the site consists of a lower floodplain area, which is inundated for a sufficient duration to support wetland hydrology in more than 7 out of 10 years, a less frequently inundated upper floodplain and a small area of river bluff. The slope break between the lower and upper floodplain occurs at about 132.3 m (434 ft) elevation. To facilitate agriculture, the hydrology of the site has been modified. Ditch and tile drainage systems are in place, a levee is present, and pumps were operational. Since establishment of the bank, the pumps have been removed and portions of the tile and ditch systems deactivated or plugged. In 2002, a flood event breached the levee in two places. For organizational and management purposes, the site has been arbitrarily divided into 16 Areas (Watson et al. 2004).

The general site plan calls for emergent wetland establishment through natural regeneration on the lower floodplain and forested wetland planting on the upper floodplain. Wetland enhancement of areas designated as farmed wetland (FW) is expected to result in 95.8 ha (237 acres) of emergent wetland. Restoration of areas designated as prior converted cropland (PC) is expected to generate 220.3 ha (544.2 acres) of emergent wetland and 117.4 ha (290.1 acres) of forested wetland (Watson et al. 2004). In 2006, the upper floodplain was still in crops. The lower floodplain has recently been allowed to revert to natural vegetation. While qualitative vegetation assessment has been carried out on the lower floodplain for two years (Busemeyer and Plocher 2004, 2005), the INHS was tasked to conduct quantitative vegetation monitoring on part of this area (Areas 1, 2 and 3) in 2006. Areas 2, 6 and 8 (other than Horseshoe Lake) have been out of agriculture for four years, Area 1 for six years, and Area 3 and Horseshoe Lake for eight years (Busemeyer and Plocher 2004). Area 5 was forested until the previous landowner burned it down before selling the property.

In 2010, field monitoring was conducted on 9, 10 and 17 September. This report details results of the 2010 monitoring. Project goals, objectives and performance criteria are included, as are monitoring methods, monitoring results, summary information and

recommendations. A wetland banking prospectus (IDOT 2002)) and Wetland Banking Instrument (Watson et al. 2004) were prepared by the Illinois State Geological Survey and Illinois Natural History Survey.

Project Goals, Objectives and Performance Criteria

Proposed goals and objectives are based on information contained in the original IDOT project request (Sunderland, 2006) and the Wetland Banking Instrument (Watson et al. 2004). Performance criteria are based on those specified in the U. S. C. O. E. Wetland Delineation Manual (Environmental Laboratory, 1987), and Guidelines for Developing Mitigation Proposals (USACOE, 1993). Each goal should be attained by the end of the monitoring period. Project goals, objectives and performance criteria are listed below.

Project goal 1: The created wetland site should be determined to be jurisdictional by current federal standards.

Objective: The goal is to enhance 237 acres of Farmed Wetland and restore 834 acres of Prior Converted cropland by establishing emergent, scrub shrub and forested wetland.

Performance Criteria: The entire created wetland should satisfy the three criteria of the federal wetland definition: 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 must be present, or conditions favorable to the formation of hydric soil must persist at the site.

C. Presence of wetland hydrology - the created wetland must be inundated at an average depth of less than 2 m (6.6 ft) or have soils saturated to the surface for at least 12.5 % of the growing season.

Project goal 2: The created wetland should meet minimum standards as to floristic composition.

Objective: The created wetland should compensate in-kind for loss of forested, scrub shrub and emergent wetlands. The wetland compensation should be composed of vegetation characteristic of forested, scrub shrub, and emergent wetlands.

Performance Criteria: At least 80% of the planted trees and shrubs should be established and living. At least 90% of the plant species present should be non-weedy, native, annual and perennial species. At least 75% of plant cover should be native. None of the three most dominant species in any stratum should be nonnative, or weedy species.

Methods

Monitoring will be performed on the wetland bank site. Illinois Natural History Survey personnel qualitatively monitored the lower floodplain in 2004 and 2005, conducted quantitative vegetation monitoring from 2006 to 2008, and will continue to monitor the site until the Illinois Department of Transportation requests that monitoring cease. Monitoring of tree plantings on the upper floodplain began in 2007. The Illinois State Geological Survey has been tasked to monitor hydrology. Monitoring reports on the status of the wetland creation site will be submitted annually. The likelihood of meeting the proposed goals and performance criteria will be addressed. If evidence is discovered indicating that the goals/performance criteria will not be met by the end of the monitoring period, written management recommendations will be submitted to IDOT in an effort to correct the problems.

Project Goal 1

Wetland restoration and enhancement areas will be mapped in the field, and boundaries overlain on digital ortho photographs using Arcview 3.2.

A. Hydrophytic Vegetation - In the lower floodplain area, species composition (dominant species) will be determined annually through visual estimation. In previous years, species composition was determined by quantitative sampling. After three years, we have determined that species composition is simple enough to be easily and accurately determined by visual estimation. For Areas 4 and 7 on the upper floodplain, planted trees were tallied in 30.2 m planted row sections at 302 m intervals (10% sample). In 2008, after severe flooding, planted tree survival was about 42%. After additional severe flooding in 2009, planted tree survival was about 6% or 7%. In 2010, planted tree survival is 0.94%. Therefore it is no longer necessary to sample planted trees in order to determine that survival is far below the required 80%. Herbaceous species composition in the reforestation areas will be determined using visual estimation. Dominance is based on Importance Value, a numerical average of species' relative frequency, density and/or aerial coverage (Cox 1985). In each stratum dominant species include, starting with the most dominant, those species whose Importance Values, when summed in descending order, exceed 50%, as well as any additional species whose Importance Values are 20% or greater (Federal Interagency Committee for Wetland Delineation, 1989). Dominant species are assigned wetland indicator status ratings (Reed, 1988). Any plant rated facultative or wetter (FAC, FAC+, FACW-, FACW, FACW+ or OBL) is considered hydrophytic. Hydrophytic vegetation is determined to be

present if greater than 50% of the dominant species are hydrophytic (Environmental Laboratory 1987).

B. Hydric Soils – In 2000, soil cores collected from the mitigation site were examined for the presence of redoximorphic features (Environmental Laboratory 1987). Being on the floodplain of the Illinois River, virtually the entire area was underlain by hydric soils (IDOT 2002).

Wetland Hydrology - The extent of wetland hydrology at this site was monitored by the Illinois State Geological Survey and is shown on the accompanying figure (Carr 2010). Wetland hydrology occurs when inundation or saturation to land surface is present for greater than 5% of the growing season (10 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 (26 days at this site) to satisfy wetland hydrology criteria (Environmental Laboratory 1987 [http://el.erdc.usace.army.mil/wetlands/pdfs/wlman87.pdf]).
During long-duration flooding at the site, the U.S. Army Corps of Engineers gauge at the nearby lock and dam and one on-site data logger were the primary sources of waterlevel elevation data. Also as a result of this flooding, only four soil-zone monitoring wells were accessible above the flood line for reading or surveying for most of the spring. Of these, wells 14S, 41S, and 42S satisfied wetland hydrology criteria for greater than 5% of the growing season, and 41S and 42S for greater than 12.5% of the growing season. According to the 2010 Midwest Region supplement, wells 14S, 41S, and 42S also satisfied wetland hydrology criteria for 14 or more consecutive days during the growing season. Water levels recorded via data logger at an on-site gauge (SW1B) showed surfacewater inundation for a period sufficient to satisfy wetland hydrology criteria at an elevation of at least 134.75 m (442.09 ft) for greater than 5% of the growing season and at an elevation of at least 133.50 m (437.99 ft) for greater than 12.5% of the growing season. According to the 2010 Midwest Region supplement, surface-water levels at the SW1B data logger also satisfied wetland hydrology criteria at an elevation of at least 134.25 m (440.45 ft) for 14 or more consecutive days during the growing season (Carr 2010).

Information provided by ISGS concerning hydrology of the site is incorporated into this report. In addition, visual inspection of the site for field indicators of wetland hydrology, such as landscape position, inundation or surface saturation or wetland drainage and debris patterns, will be used to determine the presence of wetland hydrology (Environmental Laboratory 1987).

Project Goal 2

Vegetation – Dominant plant species in each stratum in each plant community in the lower floodplain area will be determined annually by visual estimation.
In the upper floodplain area, dominant plant species will be determined by visual estimation. Lists of dominant species will be examined in an attempt to ensure that,

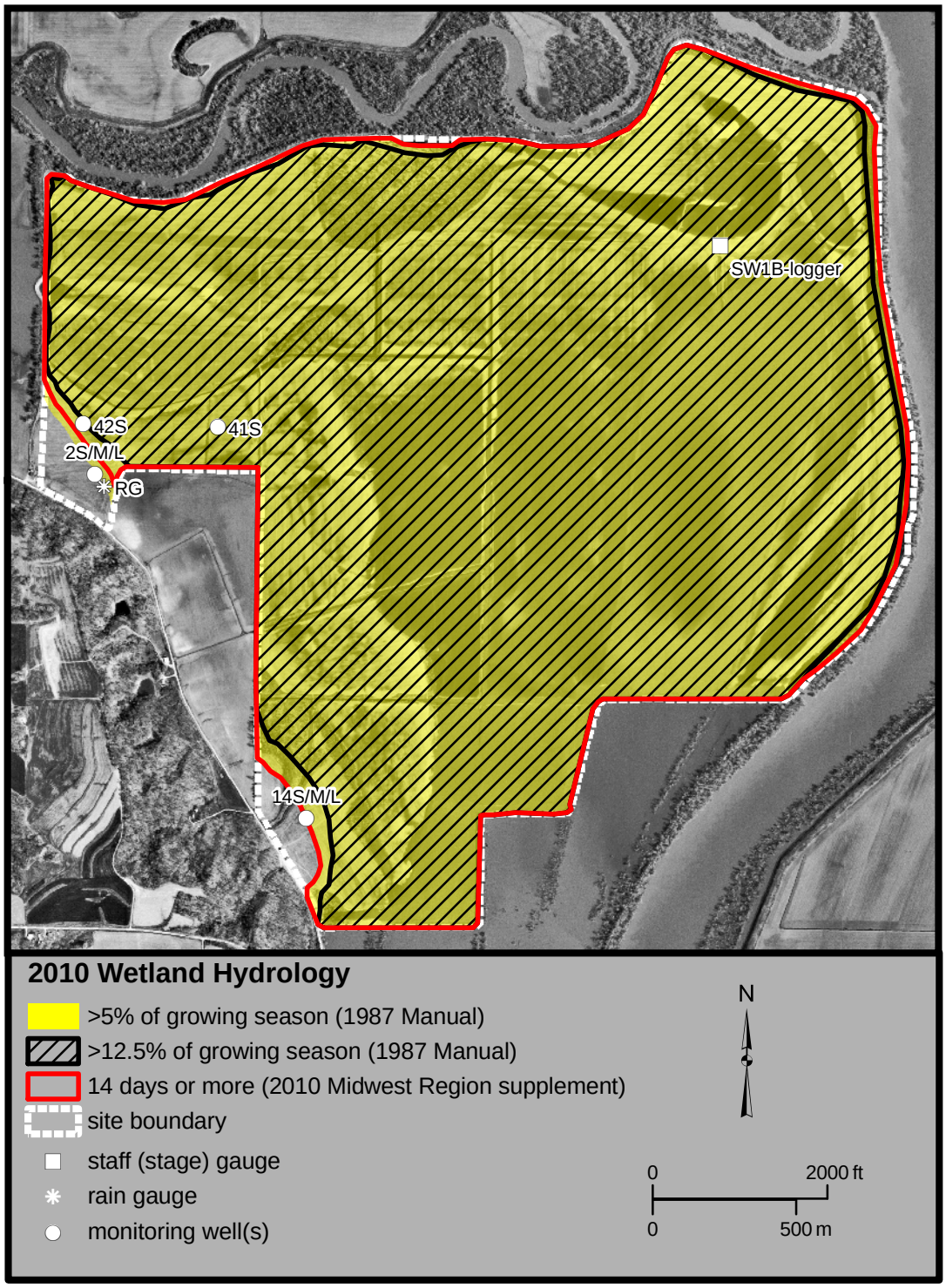
in the enhancement and restoration areas, none of the three most dominant species are weedy or non-native. A species list will be prepared annually for each community in order to determine whether at least 90% of the plant species are native and non-weedy. A Floristic Quality Index will be computed annually for each plant community (Taft et al 1997).

La Grange Wetland Mitigation Bank

Estimated Areal Extent of 2010 Wetland Hydrology

September 1, 2009 through August 31, 2010

map based upon USGS digital orthophotograph, Cooperstown NE quarter-quadrangle, produced from 4/14/98 aerial photography (ISGS 2002)



Results

Project Goal 1: The created wetland site should be determined to be jurisdictional by current federal standards.

In Areas 1, 2, 3, 5, 6 and 8 of the lower floodplain, four plant communities were identified in 2010. In areas of lowest elevation, within Big Lake and Crane Lake, extensive unvegetated open water areas were present (Area A). Adjacent to A there is a mudflat community (B), dominated by *Polygonum amphibium* (OBL), *Cyperus ferruginescens* (OBL), *Xanthium strumarium* (FAC), *Polygonum pensylvanicum* (FACW+), *Echinochloa muricata* (OBL) and *Lindernia dubia* (OBL). At slightly higher elevations, occupying depressions and meander scars, there is marsh (C), dominated by *Polygonum amphibium* (OBL). Most of the rest of the lower floodplain is a wet forbland (D) dominated by *Echinochloa muricata* (OBL), *Xanthium strumarium* (FAC), *Cyperus ferruginescens* (OBL), *Polygonum amphibium* (OBL) and *Eragrostis hypnoides* (OBL). In Area 5 there is a wet forest/savanna community (E) dominated by *Acer saccharinum* (FACW), *Acalypha rhomboidea* (FACU) and *Amaranthus tuberculatus* (OBL) where the previous landowner attempted to burn down a forest. In 2010, all plant communities on the lower floodplain have hydrophytic vegetation. The entire lower floodplain is underlain by hydric soils (figure 2, Appendix 1).

In 2010, precipitation was 154% of normal at the La Grange Bank Site. Precipitation was 118% of normal March through May and large precipitation events upstream led to widespread flooding. From June through August precipitation was 209% of normal resulting in more flooding. In 2010, 1395 out of 1643 acres conclusively supported wetland hydrology (12.5% of growing season). The entire lower floodplain (850 acres), conclusively supported wetland hydrology in 2010 (figure 1) (Carr 2009).

Project goal 2: The created wetland should meet minimum standards as to floristic composition.

Vegetation

In 2010, multiple severe floods had just receded in September resulting in less open water and a greater area of mudflat, and set back vegetation to an earlier successional stage. The open water area (Community A) decreased from 401.6 acres to 335 acres. Thousands of waterfowl were again observed. Adjacent to open water, there was a larger area of mudflat this year (159.5 acres compared to 30.9 acres), dominated by *Polygonum amphibium* (OBL), *Cyperus ferruginescens* (OBL), *Xanthium strumarium* (FAC), *Polygonum pensylvanicum* (FACW+), *Echinochloa muricata* (OBL) and *Lindernia dubia* (OBL). FQI in this area decreased from 16.3 to 13.8. Percent nonweedy native species increased from 68.4% to 73.9%. The marsh (Community C) increased in area (69 acres compared to 62.9 acres) and was still dominated by *Polygonum amphibium*. FQI decreased from 13.2 to 12.6, and percent nonweedy native species decreased from 75% to 72.2%. The wet forbland (Community D) was again the plant community occupying the largest part of Areas 1, 2, 3, 5, 6 and 8, although the acreage decreased from 2009 (277.3 acres compared to 346.9 acres). In the 2009 report, wet forbland acreage was reported as 360.4 acres, which was an error. Due to disturbance, this community is dominated by *Echinochloa muricata, Xanthium strumarium* and *Cyperus ferruginescens* in Areas 5, 6 and 8. *Echinochloa muricata, Xanthium strumarium, Cyperus ferruginescens* and *Eragrostis hypnoides* are dominants in Area 1, while *Echinochloa muricata, Xanthium strumarium, Cyperus ferruginescens, Polygonum amphibium* and *Eragrostis hypnoides* dominate in Area 2. In Area 3 *Cyperus ferruginescens, Xanthium strumarium, Polygonum amphibium* and *Eragrostis hypnoides* are dominant. The number of species present decreased from 57 to 46. FQI decreased from 16.4 to 13.7. Percent nonweedy native species decreased from 61.4% to 56.5%. The increase in flooding resulted in a decrease in percent upland species (from 12% to 9%) (Plocher, et al. 2009). In Area 5 there is a small area of wet forest/savanna (9.2 acres) as a result of fire in the previous forest. *Acer saccharinum* is the dominant tree species, while *Acalypha rhomboidea* and *Amaranthus tuberculatus* dominate the understory. In this area FQI increased from 11.9 to 14.7 and percent nonweedy native species increased from 72.4% to 73.8%. Since all dominant species are native and no nonnative species are abundant, all areas have greater than 75% native vegetation cover. However, all areas except the marsh have weedy native species as dominants. In all areas, less than 90% of the species present are nonweedy and native. Therefore, no area meets the performance standard for floristic composition. Due to flooding through July, the State and Federally listed *Boltonia decurrens* was not observed in 2010 (Tables 1 - 7, Appendix 1, figure 2).

Table 1. Dominant Understory species of Mudflat (Community B, Area 1).

Species
Polygonum amphibium
Cyperus ferruginescens
Xanthium strumarium

Table 2. Dominant Understory species of Mudflat (Community B, Areas 2, 3, 6).

Species
Polygonum amphibium

Table 3. Dominant Understory species of Mudflat (Community B, Area 5).

Species
Polygonum pensylvanicum
Echinochloa muricata
Lindernia dubia

Table 4. Dominant Understory species of Marsh (Community C).

Species
Polygonum amphibium

Table 5. Dominant Understory species of Wet Forbland (Community D, Area 1).

Species
Echinochloa muricata
Xanthium strumarium
Cyperus ferruginescens
Eragrostis hypnoides

Table 6. Dominant Understory species of Wet Forbland (Community D, Area 2).

Species
Echinochloa muricata
Xanthium strumarium
Cyperus ferruginescens
Polygonum amphibium
Eragrostis hypnoides

Table 7. Dominant Understory species of Wet Forbland (Community D, Area 3).

Species
Cyperus ferruginescens
Xanthium strumarium
Polygonum amphibium
Eragrostis hypnoides

Table 8. Dominant Understory species of Wet Forbland (Community D, Area 5, 6, 8).

Species
Echinochloa muricata
Xanthium strumarium
Cyperus ferruginescens

Table 9. Dominant species of Wet Forest/Savanna (Community E).

Species	Layer
Acer saccharinum	tree
Acalypha rhomboidea	herb
Amaranthus tuberculatus	herb

Summary and Recommendations

In 2010, after severe growing season floods, all of Areas 1, 2, 3, 5, 6 and 8 (850 acres) again had measured wetland hydrology. Due to receding floodwater in September, there was more mudflat (159.5 acres compared to 30.9 acres) and less open water (335 acres compared to 401.6 acres), still providing excellent waterfowl habitat. In all, there were 515 acres of vegetated wetland and 335 acres of open water. Floristic Quality increased in the mudflat community (12.7 to 16.3), marsh community (13.2 -13.8) and wet forbland (13.6 to 16.4). The mudflat, wet forbland and wet forest/savanna have weedy species among the three most dominant (*Echinochloa muricata, Xanthium strumarium, Cyperus ferruginescens, Acalypha rhomboidea, Amaranthus tuberculatus*). All plant communities have less than 90% of the species present native and nonweedy (≤ 75%). In Community D (wet forbland) only 61.4% of species present are native and nonweedy. However, all plant communities have greater than 75% native cover. The State and Federally listed *Boltonia decurrens* was not observed this year. Due to extreme flooding *Phalaris arundinacea* was not observed in 2010. This site still appears to be doing well and is recovering from decades of row crop agriculture.

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Appendix 1: Wetland Report

A brief functional assessment of each wetland is provided in this report. However, this assessment is not an exhaustive description of the values of the site. The Floristic Quality Index (FQI), Developed by Taft, Ladd, Wilhelm and Masters (*Floristic Quality Assessment for Vegetation in Illinois*, 1997), was applied to the vegetation of each site. This index should not be used as a substitute for quantitative analysis, but it does provide a measure of floristic integrity. The FQI is calculated as follows: $I=R/\sqrt{N}$, where R represents the sum of the numerical ratings for all species recorded in the area, and N represents the number of recorded native species. The mean C is calculated as: mean C=R/N. FQI values of 10 or less indicate low natural quality, while sites with values of 20 or more (mean c generally greater than 3.0) have at least some evidence of native character and may be considered environmental assets.

Site B: This mudflat is located in depressions within Areas 1, 2, 3 and 5. Hydrophytic vegetation, hydric soils and wetland hydrology are all present. Therefore this site is a wetland. The site occupies 64.6 ha (159.5 acres). Hydrologic inputs are precipitation, sheetflow and overflow from the Illinois River. Water leaves the site by evapotranspiration. The site provides floodwater storage and wildlife habitat of good quality. The NWI codes the site as PFO1A, PEMFh, L2EM2Gh or L1UBHh. The FQI is 16.3, which is indicative of fair natural quality.

Site C: This marsh is located in depressions within Areas 1 and 2. Hydrophytic vegetation, hydric soils and wetland hydrology are all present. Therefore these sites are wetland. The sites occupy 27.9 ha (69 acres). Hydrologic inputs are precipitation, sheetflow and overflow from the Illinois River. Water leaves by evapotranspiration. The sites provide floodwater storage and wildlife habitat of fair quality. The NWI codes the sites as PEMC, PEMF, PEMFh, PABG, or L2EM2Gh. The FQI is 13.8, which is indicative of fair natural quality.

Site D: This wet forbland is located in Areas 1, 2, 3, 5, 6 and 8. Hydrophytic vegetation, hydric soils and wetland hydrology are all present. Therefore these sites are wetland. The sites occupy 112.3 ha (277.3 acres). Hydrologic inputs are precipitation, sheetflow and overflow from the Illinois River. Water leaves by evapotranspiration and sheetflow. The sites provide floodwater storage and wildlife habitat of fair quality. The NWI codes part of the sites as PFO1A, PEMA, PEMAh, PEMC, PEMCh, PEMFh, L2EM2Gh or L1UBHh, and parts of the sites are not coded as wetland. The FQI is 16.4, which is indicative of fair natural quality.

Site E: This wet forest/savanna is located in Areas 5. Hydrophytic vegetation, hydric soils and wetland hydrology are all present. Therefore the site is a wetland. The site occupies 3.7 ha (9.2 acres). Hydrologic inputs are precipitation, sheetflow and overflow from the Illinois River. Water leaves by evapotranspiration and sheetflow. The site provides floodwater storage and wildlife habitat of fair quality. The NWI codes the site as PFO1A. The FQI is 11.9, which is indicative of fair natural quality.

Watershed Data:

This site is in the watershed for the Illinois River, which has a drainage area of 62,748 km^2 (24,227 mi^2) at Beardstown, IL. The USGS hydrologic unit code is 07130011, Illinois River, Lower.

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

Field Investigators: Plocher, Ketzner, Keene **Date:** 9, 10, 17 September 2010
Project Name: LaGrange/Brown Co. Mitigation Bank
State: Illinois **County:** Brown **Applicant:** IDOT District 6
Site Name: Mudflat
Legal Description: T. 1 S., R. 1 W., NE/4 Sect. 17, S/2, Sect. 16, Sect. 21, E/2 SE/4 Sect. 20

Location: Areas 1, 2, 3 and 5

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

VEGETATION

Dominant Plant Species	Stratum	Indicator Status
1. *Polygonum amphibium*	herb	OBL
2. *Cyperus ferruginescens*	herb	OBL
3. *Xanthium strumarium*	herb	FAC
4. *Polygonum pensylvanicum*	herb	FACW+
5. *Echinochloa muricata*	herb	OBL
6. *Lindernia dubia*	herb	OBL

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

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

SOILS*
* field checked in 2000
Series and phase: Mapped as Darwin silty clay and Water by NRCS. Revised to Wagner silt loam and Water.
On county hydric soils list? Yes: X No:
Is the soil a histosol? Yes: No: X
Histic epipedon present? Yes: No: X
Redox Concentrations? Yes: X No:
Redox Depletions? Yes: X No:
Matrix color: N 4/
Other indicators: none
Hydric soils? Yes: X No:
Rationale: This soil meets the requirements for NRCS hydric soil indicator F2 –loamy gleyed matrix.

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

Field Investigators: Plocher, Ketzner, Keene **Date:** 9, 10, 17 September 2010
Project Name: LaGrange/Brown Co. Mitigation Bank
State: Illinois **County:** Brown **Applicant:** IDOT District 6
Site Name: Mudflat
Legal Description: T. 1 S., R. 1 W., NE/4 Sect. 17, S/2, Sect. 16, Sect. 21, E/2 SE/4 Sect. 20
Location: Areas 1, 2, 3 and 5

HYDROLOGY

Inundated: Yes: X (in places) No: Depth of standing water: 0 - 0.08 m (0 -3 in)
Depth to saturated soil: at surface
Overview of hydrological flow through the system: Primary hydrologic inputs to this site are precipitation, sheetflow and overflow from the Illinois River. Evapotranspiration and sheetflow are the major outputs.
Size of watershed: 62,748 km^2 (24,227 mi^2) at Beardstown, IL
Other field evidence observed: This area occupies topographic depressions on the Illinois River floodplain.

Wetland hydrology: Yes: X No:
Rationale: Field evidence listed above indicates that this site is flooded or saturated for a sufficient period during the growing season to meet the criterion of wetland hydrology.

WETLAND DETERMINATION AND RATIONALE:

Is the site a wetland?: Yes: X No:
Rationale: Hydrophytic vegetation, hydric soils, and wetland hydrology are all present. Therefore the site is a wetland. The site is coded by the NWI as PFO1A, PEMFh, L2EM2Gh or L1UBHh (palustrine, forested, deciduous, temporarily flooded or emergent, semipermanently flooded, diked/impounded) or lacustrine, littoral/limnetic, emergent/unconsolidated bottom intermittently exposed/permanently flooded, diked/impounded).

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ROUTINE ON-SITE WETLAND DETERMINATION

Site B (page 3 of 3)

Field Investigators: Plocher, Ketzner, Keene **Date:** 9, 10, 17 September 2010
Project Name: LaGrange/Brown Co. Mitigation Bank
State: Illinois **County:** Brown **Applicant:** IDOT District 6
Site Name: Mudflat
Legal Description: T. 1 S., R. 1 W., NE/4 Sect. 17, S/2, Sect. 16, Sect. 21, E/2 SE/4 Sect. 20
Location: Areas 1, 2, 3 and 5

SPECIES LIST

Scientific name	Common name	Stratum	Wetland indicator status	C†
Amaranthus tuberculatus	water hemp	herb	OBL	1
Ammannia coccinea	ammannia	herb	OBL	5
Bidens connata	beggar's ticks	herb	OBL	2
Cephalanthus occidenatis	buttonbush	shrub/seedling	OBL	4
Cyperus ferruginescens	flatsedge	herb	OBL	1
Echinochloa muricata	barnyard grass	herb	OBL	0
Eleocharis obtusa	spikerush	herb	OBL	2
Eragrostis hypnoides	creeping lovegrass	herb	OBL	5
Heteranthera limosa	duck salad	herb	OBL	9
Hibiscus laevis	halberd leaf rose mallow	herb	OBL	4
Ipomaea lacunosa	small white morning glory	herb	FACW	1
Leersia oryzoides	rice cutgrass	herb	OBL	3
Lindernia dubia	false pimpernel	herb	OBL	5
Ludwigia peploides	creeping primrose willow	herb	OBL	5
Panicum capillare	witch grass	herb	FAC	0
Polygonum amphibium	water smartweed	herb	OBL	3
Polygonum lapathifolium	nodding smartweed	herb	FACW+	0
Polygonum pensylvanicum	giant smartweed	herb	FACW+	1
Rorippa islandica	marsh yellow cress	herb	OBL	4
Sagittaria latifolia	arrowhead	herb	OBL	4
Salix amygdaloides	peach leaf willow	sapling	FACW	4
Scirpus fluviatilis	river bulrush	herb	OBL	3
Xanthium strumarium	cocklebur	herb	FAC	0

† Coefficient of Conservatism (Taft et al. 1997)
* Non-native species
Percent native and nonweedy: 17/23 = 73.9%

$mCv = \sum C/N = 66/23 = 2.87$
$FQI = \sum C/\sqrt{N} = 66/\sqrt{23} = 13.76$
Quality = fair

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

Field Investigators: Plocher, Ketzner, Keene **Date:** 9, 10, 17 September 2010
Project Name: LaGrange/Brown Co. Mitigation Bank
State: Illinois **County:** Brown **Applicant:** IDOT District 6
Site Name: Marsh
Legal Description: T. 1 S., R. 1 W., Sect. 16, NE/4 Sect. 21

Location: Areas 1 and 2

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

VEGETATION

Dominant Plant Species	Stratum	Indicator Status
1. *Polygonum amphibium*	herb	OBL

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

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

SOILS*
*field checked in 2000
Series and phase: Mapped as Darwin silty clay and Titus silty clay loam by NRCS. Revised to Wagner silt loam.
On county hydric soils list? Yes: X No:
Is the soil a histosol? Yes: No: X
Histic epipedon present? Yes: No: X
Redox Concentrations? Yes: X No:
Redox Depletions? Yes: X No:
Matrix color: N 4/ and 5Y 4/1
Other indicators: The site occupies a depressional landscape position.
Hydric soils? Yes: X No:
Rationale: This soil meets the requirements for NRCS hydric soil indicators F2 – loamy gleyed matrix, F3 – depleted matrix.

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

Field Investigators: Plocher, Ketzner, Keene **Date:** 9, 10, 17 September 2010
Project Name: LaGrange/Brown Co. Mitigation Bank
State: Illinois **County:** Brown **Applicant:** IDOT District 6
Site Name: Marsh
Legal Description: T. 1 S., R. 1 W., Sect. 16, SW/4 Sect. 21
Location: Areas 1 and 2

HYDROLOGY

Inundated: Yes: X No: Depth of standing water: 0.15 – 0.46 m (6 – 18 in)
Depth to saturated soil: at surface
Overview of hydrological flow through the system: Primary hydrologic inputs to this site are precipitation, sheetflow and overflow from the Illinois River. Evapotranspiration is the major output.
Size of watershed: 62,748 km^2 (24,227 mi^2) at Beardstown, IL
Other field evidence observed: The sites are depressions on the lower floodplain of the Illinois River.

Wetland hydrology: Yes: X No:
Rationale: Field evidence listed above indicates that this site is flooded or saturated for a sufficient period during the growing season to meet the criterion of wetland hydrology.

WETLAND DETERMINATION AND RATIONALE:

Is the site a wetland?: Yes: X No:
Rationale: Hydrophytic vegetation, hydric soils and wetland hydrology are all present. Therefore the site is a wetland. The sites are coded by the NWI as PEMC, PEMF, PEMFh, PABG (palustrine, emergent/aquatic bed, seasonally flooded/semipermanently flooded/intermittently exposed, diked/impounded) or L2EM2Gh, (lacustrine littoral, emergent nonpersistent, intermittently exposed, diked/impounded).

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

Field Investigators: Plocher, Ketzner, Keene **Date:** 9, 10, 17 September 2010
Project Name: LaGrange/Brown Co. Mitigation Bank
State: Illinois **County:** Brown **Applicant:** IDOT District 6
Site Name: Marsh
Legal Description: T. 1 S., R. 1 W., Sect. 16, SW/4 Sect. 21

Location: Areas 1 and 2

SPECIES LIST

Scientific name	Common name	Stratum	Wetland indicator status	C†
Abutilon theophrasti	velvet leaf	herb	FACU-	*
Amaranthus tuberculatus	water hemp	herb	OBL	1
Ammannia coccinea	ammannia	herb	OBL	5
Bidens connata	beggar's ticks	herb	OBL	2
Bidens frondosa	beggar's ticks	herb	FACW	1
Cephalanthus occidentalis	buttonbush	shrub	OBL	4
Cyperus ferruginescens	flatsedge	herb	OBL	1
Echinochloa muricata	barnyard grass	herb	OBL	0
Eragrostis hypnoides	creeping lovegrass	herb	OBL	5
Foresteira acuminata	swamp privet	shrub	OBL	6
Ipomoea lacunosa	small white morning glory	herb	FACW	1
Lemna minor	duckweed	herb	OBL	3
Leptochloa panicoides	salt meadow grass	herb	OBL	9
Polygonum amphibium	water smartweed	herb	OBL	3
Salix nigra	black willow	shrub	OBL	3
Scirpus fluviatilis	river bulrush	herb	OBL	3
Spirodela polyrhiza	big duckweed	herb	OBL	5
Xanthium strumarium	cocklebur	herb	FAC	0

† Coefficient of Conservatism (Taft et al. 1997)
* Non-native species
Percent native and nonweedy: 24/32 = 72.2%

$mCv = \sum C/N = 52/17 = 3.06$
$FQI = \sum C/\sqrt{N} = 52/\sqrt{17} = 12.61$
Quality = fair

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

Field Investigators: Plocher, Ketzner, Keene **Date:** 9, 10, 17 September 2010
Project Name: LaGrange/Brown Co. Mitigation Bank
State: Illinois **County:** Brown **Applicant:** IDOT District 6
Site Name: Wet Forbland
Legal Description: T. 1 S., R. 1 W., Sect. 16, 21, E/2 Sect. 17

Location: Areas 1, 2, 3, 5, 6 and 8

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

VEGETATION

Dominant Plant Species	Stratum	Indicator Status
1. *Echinochloa muricata*	herb	OBL
2. *Xanthium strumarium*	herb	FAC
3. *Cyperus ferruginescens*	herb	OBL
4. *Eragrostis hypnoides*	herb	OBL
5. *Polygonum amphibium*	herb	OBL

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

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

SOILS*
* field checked in 2000
Series and phase: Mapped as Beaucoup silty clay loam, Titus silty clay loam and Darwin silty clay by NRCS. Revised to Wagner silt loam
On county hydric soils list? Yes: X No:
Is the soil a histosol? Yes: No: X
Histic epipedon present? Yes: No: X
Redox Concentrations? Yes: X No:
Redox Depletions? Yes: X No:
Matrix color: N 4/ and 5Y 4/1
Other indicators: level to depressional landscape position
Hydric soils? Yes: X No:
Rationale: This soil meets the requirements for NRCS hydric soil indicators F2 – loamy gleyed matrix, F3 – depleted matrix.

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

Field Investigators: Plocher, Ketzner, Keene **Date:** 9, 10, 17 September 2010
Project Name: LaGrange/Brown Co. Mitigation Bank
State: Illinois **County:** Brown **Applicant:** IDOT District 6
Site Name: Wet Forbland
Legal Description: T. 1 S., R. 1 W., Sect. 16, 21, E/2 Sect. 17

Location: Areas 1, 2, 5, 6 and 8

HYDROLOGY

Inundated: Yes: No: X Depth of standing water: NA
Depth to saturated soil: 0 - 0.66 m (26 in)
Overview of hydrological flow through the system: Primary hydrologic inputs to this site are precipitation, sheetflow and overflow from the Illinois River. Evapotranspiration and sheetflow are the major outputs.
Size of watershed: 62,748 km^2 (24,227 mi^2) at Beardstown, IL
Other field evidence observed: level to depressional landscape position

Wetland hydrology: Yes: X No:
Rationale: Field evidence listed above indicates that this site is flooded or saturated for a sufficient period during the growing season to meet the criterion of wetland hydrology.

WETLAND DETERMINATION AND RATIONALE:

Is the site a wetland?: Yes: X No:
Rationale: Hydrophytic vegetation, hydric soils and wetland hydrology are all present. Therefore the site is a wetland. Part of the site is coded by the NWI as PFO1A, PEMA, PEMAh, PEMC, PEMCh, PEMFh (palustrine, Forested, deciduous, temporarily flooded or emergent, temporarily flooded/seasonally flooded/semipermanently flooded, diked/impounded), or L2EM2Gh, L1UBHh (lacustrine littoral/limnetic, emergent nonpersistent/unconsolidated bottom, intermittently exposed/permanently flooded, diked/impounded) and part is not coded as wetland.

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

Field Investigators: Plocher, Ketzner, Keene **Date:** 9, 10, 17 September 2010
Project Name: LaGrange/Brown Co. Mitigation Bank
State: Illinois **County:** Brown **Applicant:** IDOT District 6
Site Name: Wet Forbland
Legal Description: T. 1 S., R. 1 W., Sect. 16, 21, E/2 Sect. 17

Location: Areas 1, 2, 3, 5, 6 and 8

SPECIES LIST

Scientific name	Common name	Stratum	Wetland indicator status	C†
Abutilon theophrasti	velvet leaf	herb	FACU-	*
Amaranthus tuberculatus	water hemp	herb	OBL	1
Ambrosia artemisiifolia	common ragweed	herb	FACU	0
Ammannia coccinea	ammannia	herb	OBL	5
Amsonia tabernaemontana	blue star	herb	FACW	6
Apocynum sibiricum	Indian hemp	herb	FAC+	2
Aster simplex	panicled aster	herb	FACW	3
Bidens aristosa	swamp marigold	herb	FACW	1
Bidens connata	beggar's ticks	herb	OBL	2
Bidens frondosa	beggar's ticks	herb	FACW	1
Campsis radicans	trumpet creeper	herb	FAC	2
Cassia fasciculata	partridge pea	herb	FACU-	1
Cephalanthus occidentalis	buttonbush	shrub	OBL	4
Chamaesyce humistrata	milk spurge	herb	FACW	1
Cynanchum laeve	blue vine	herb	FAC	1
Cyperus acuminatus	taperleaf flatsedge	herb	OBL	2
Cyperus erythrorhizos	red rooted flatsedge	herb	OBL	1
Cyperus ferruginescens	flatsedge	herb	OBL	1
Echinochloa muricata	barnyard grass	herb	OBL	0
Eleocharis smallii	spikerush	herb	OBL	5
Eragrostis hypnoides	creeping lovegrass	herb	OBL	5
Eragrostis pectinacea	Carolina lovegrass	herb	FAC	0
Eupatorium serotinum	late flowering thoroughwort	herb	FAC+	1

† Coefficient of Conservatism (Taft et al. 1997)
* Non-native species

(Continued on following page)

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

Field Investigators: Plocher, Ketzner, Keene **Date:** 9, 10, 17 September 2010
Project Name: LaGrange/Brown Co. Mitigation Bank
State: Illinois **County:** Brown **Applicant:** IDOT District 6
Site Name: Wet Forbland
Legal Description: T. 1 S., R. 1 W., Sect. 16, 21, E/2 Sect. 17

Location: Areas 1, 2, 3, 5, 6 and 8

SPECIES LIST (Continued)

Scientific name	Common name	Stratum	Wetland indicator status	C†
Foresteira acuminata	swamp privet	shrub	OBL	6
Fraxinus pennsylvanica	green ash	seedling	FACW	2
Hibiscus laevis	halberd leaf rose mallow	herb	OBL	4
Ipomaea hederacea	ivy leaf morning glory	herb	FAC	*
Ipomaea lacunosa	small white morning glory	herb	FACW	1
Leptochloa fascicularis	bearded sprangle top	herb	OBL	0
Lindernia dubia	false pimpernel	herb	OBL	5
Mollugfo verticillatus	carpetweed	herb	FAC	*
Panicum capillare	witch grass	herb	FAC	0
Panicum dichotomiflorum	fall panicum	herb	FACW-	0
Polygonum amphibium	water smartweed	herb	OBL	3
Polygonum lapathifolium	nodding smartweed	herb	FACW+	0
Polygonum pensylvanicum	giant smartweed	herb	FACW+	1
Populus deltoides	cottonwood	seedling	FAC+	2
Portulaca oleracea	purslane	herb	FAC-	*
Rorippa islandica	marsh yellow cress	herb	OBL	4
Sagittaria latifolia	arrowhead	herb	OBL	4
Salix amygdaloides	peach leaf willow	shrub	FACW	4
Salix exigua	sandbar willow	shrub	OBL	1
Salix nigra	black willow	shrub	OBL	3
Scirpus fluviatilis	river bulrush	herb	OBL	3
Sida spinosa	prickly sida	herb	FACU	*
Xanthium strumarium	cocklebur	herb	FAC	0

† Coefficient of Conservatism (Taft et al. 1997) mCv = $\sum C/N = 88/41 = 2.15$
* Non-native species FQI = $\sum C/\sqrt{N} = 88/\sqrt{41} = 13.74$ Quality = fair
Percent native and nonweedy: 26/46 = 56.5%

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

Field Investigators: Plocher, Ketzner, Keene **Date:** 17 September 2010
Project Name: LaGrange/Brown Co. Mitigation Bank
State: Illinois **County:** Brown **Applicant:** IDOT District 6
Site Name: Wet Forest/Savanna
Legal Description: T. 1 S., R. 1 W., NE/4 Sect. 17

Location: Area 5

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

VEGETATION

Dominant Plant Species	**Stratum**	**Indicator Status**
1. *Acer saccharinum*	tree	FACW
2. *Acalypha rhomboidea*	herb	FACU
3. *Amaranthus tuberculatus*	herb	OBL

Percent of dominant species that are OBL, FACW, FAC+, or FAC: 66.7%

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

SOILS*
* field checked in 2000
Series and phase: Mapped as Darwin silty clay and Water by NRCS. Revised to Wagner silt loam and Water.
On county hydric soils list? Yes: X No:
Is the soil a histosol? Yes: No: X
Histic epipedon present? Yes: No: X
Redox Concentrations? Yes: X No:
Redox Depletions? Yes: X No:
Matrix color: N 4/
Other indicators: none
Hydric soils? Yes: X No:
Rationale: This soil meets the requirements for NRCS hydric soil indicator F2 –loamy gleyed matrix.

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

Field Investigators: Plocher, Ketzner, Keene **Date:** 17 September 2010
Project Name: LaGrange/Brown Co. Mitigation Bank
State: Illinois **County:** Brown **Applicant:** IDOT District 6
Site Name: Wet Forest/Savanna
Legal Description: T. 1 S., R. 1 W., NE/4 Sect. 17

Location: Area 5

HYDROLOGY
Inundated: Yes: No: X Depth of standing water: NA
Depth to saturated soil: 0.38 m (15 in)
Overview of hydrological flow through the system: Primary hydrologic inputs to this site are precipitation, sheetflow and overflow from the Illinois River. Evapotranspiration and sheetflow are the major outputs.
Size of watershed: 62,748 km^2 (24,227 mi^2) at Beardstown, IL
Other field evidence observed: This area occupies topographic depressions on the Illinois River floodplain.

Wetland hydrology: Yes: X No:
Rationale: Field evidence listed above indicates that this site is flooded or saturated for a sufficient period during the growing season to meet the criterion of wetland hydrology.

WETLAND DETERMINATION AND RATIONALE:

Is the site a wetland?: Yes: X No:
Rationale: Hydrophytic vegetation, hydric soils, and wetland hydrology are all present. Therefore the site is a wetland. The site is coded by the NWI as PFO1A (palustrine, forested, deciduous, temporarily flooded).

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ROUTINE ON-SITE WETLAND DETERMINATION

Site E (page 3 of 3)

Field Investigators: Plocher, Ketzner, Keene **Date:** 17 September 2009

Project Name: LaGrange/Brown Co. Mitigation Bank

State: Illinois **County:** Brown **Applicant:** IDOT District 6

Site Name: Wet Forest/Savanna

Legal Description: T. 1 S., R. 1 W., NE/4 Sect. 17

Location: Area 5

SPECIES LIST

Scientific name	Common name	Stratum	Wetland indicator status	C†
Acalypha rhomboidea	three seeded Mercury	herb	FACU	0
Acer negundo	box elder	tree	FACW-	1
Acer saccharinum	silver maple	tree	FACW	1
Amaranthus tuberculatus	water hemp	herb	OBL	1
Ambrosia trifida	giant ragweed	herb	FAC+	0
Asclepias incarnata	swamp milkweed	herb	OBL	4
Betula nigra	river birch	tree	FACW	4
Bidens aristosa	swamp marigold	herb	FACW	1
Bidens connata	beggar's ticks	herb	OBL	2
Bidens frondosa	beggar's ticks	herb	FACW	1
Campsis radicans	trumpet creeper	herb/woody vine	FAC	2
Carya illinoensis	pecan	tree	FACW	6
Celtis occidentalis	hackberry	tree	FAC-	3
Cephalanthus occidentalis	buttonbush	shrub	OBL	4
Cynanchum laeve	blue vine	herb	FAC	1
Cyperus ferruginescens	flatsedge	herb	OBL	1
Diospyros virginiana	persimmon	seedling	FAC	2
Fraxinus pennsylvanica	green ash	tree	FACW	2
Gleditsia triacanthos	honey locust	tree	FAC	2
Ipomaea lacunosa	small white morning glory	herb	FACW	1
Leersia virginica	white grass	herb	FACW	4

Continued on following page

ROUTINE ON-SITE WETLAND DETERMINATION

Site E (page 3 of 3)

Field Investigators: Plocher, Ketzner, Keene **Date:** 17 September 2009
Project Name: LaGrange/Brown Co. Mitigation Bank
State: Illinois **County:** Brown **Applicant:** IDOT District 6
Site Name: Wet Forest/Savanna
Legal Description: T. 1 S., R. 1 W., NE/4 Sect. 17
Location: Area 5

SPECIES LIST (Continued)

Scientific name	Common name	Stratum	Wetland indicator status	C†
Menispermum canadense	moonseed	herb/woody vine	FAC	4
Oxalis stricta	yellow wood sorrel	herb	FACU	0
Panicum dichotomiflorum	fall panicum	herb	FACW-	0
Pilea pumila	clearweed	herb	FACW	3
Platanus occidentalis	sycamore	tree	FACW	3
Polygonum pensylvanicum	giant smartweed	herb	FACW+	1
Populus deltoides	cottonwood	tree	FAC+	2
Quercus macrocarpa	burr oak	tree	FAC-	5
Quercus palustris	pin oak	tree	FACW	4
Rorippa islandica	marsh yellow cress	herb	OBL	4
Sida spinosa	prickly sida	herb	FACU	*
Smilax hispida	bristly greenbriar	herb/woody vine	FAC	3
Solanum ptycanthum	black nightshade	herb	FACU-	0
Stachys tenuifolia	slenderleaf betony	herb	OBL	5
Toxicodendron radicans	poison ivy	herb/woody vine	FAC+	1
Ulmus americana	American elm	seedling	FACW-	5
Urtica dioica	stinging nettle	herb	FAC+	2
Verbena urticifolia	white vervain	herb	FAC+	3
Vitis aestivalis	summer grape	herb/woody vine	FACU	4
Vitis riparia	riverbank grape	herb/woody vine	FACW-	2
Xanthium strumarium	cocklebur	herb	FAC	0

† Coefficient of Conservatism (Taft et al. 1997)
* Non-native species
Percent native and nonweedy: 31/42 = 73.8%

$mCv = \sum C/N = 94/41 = 2.29$
$FQI = \sum C/\sqrt{N} = 94/\sqrt{41} = 14.68$
Quality = fair

LaGrange Mitigation Site Monitoring 2010
Brown County

Site Boundary
A-open water
B-mud flat
C-marsh
D-wet forbland
E-wet forest/savanna

0 800 1600 Feet

0 200 400 Meters

scale 1:9600
1 inch=800 ft

N
W E
S

12/2010