

## TRANSMITTAL FORM

To: Bureau of Design and Environment  
Attn: Thomas Brooks  
From: Illinois Natural History Survey  
Re: Wetland Mitigation Monitoring

### Project Information and Location

La Grange Mitigation Bank – Areas 4 and 7  
Brown County  
IDOT District: 6  
Sequence Number: 9579

**Survey Conducted By:** Allen Plocher, Dave Ketzner, Brian Wilm and Brad Zercher  
University of Illinois  
Prairie Research Institute  
Illinois Natural History Survey  
Wetland Science Program  
1816 South Oak Street  
Champaign, Illinois 61820  
(217) 333-6292 (Plocher)

**Date Conducted:** 19 October 2011

### Project Summary:

We conducted the fifth year of monitoring for Areas 4 and 7 of the La Grange mitigation bank. The attached report includes information detailing monitoring methods and results. The status of the created wetland site is discussed and management recommendations are suggested; the wetland determination form is included in Appendix A. Created wetland sites are overlain on digital ortho-quad photography (DOQ) using ArcGIS and are depicted on a figure contained within. This report has been digitally uploaded to the Illinois Site Assessment Tracking System ([http://frostycap.isgs.uiuc.edu/idot\\_extranet](http://frostycap.isgs.uiuc.edu/idot_extranet)).

Signed:   
Dr. Allen E. Plocher  
INHS/IDOT project Coordinator

Date: 14 February 2012

## **Wetland Mitigation Monitoring for the La Grange Mitigation Bank - Areas 4 and 7 - 2011**

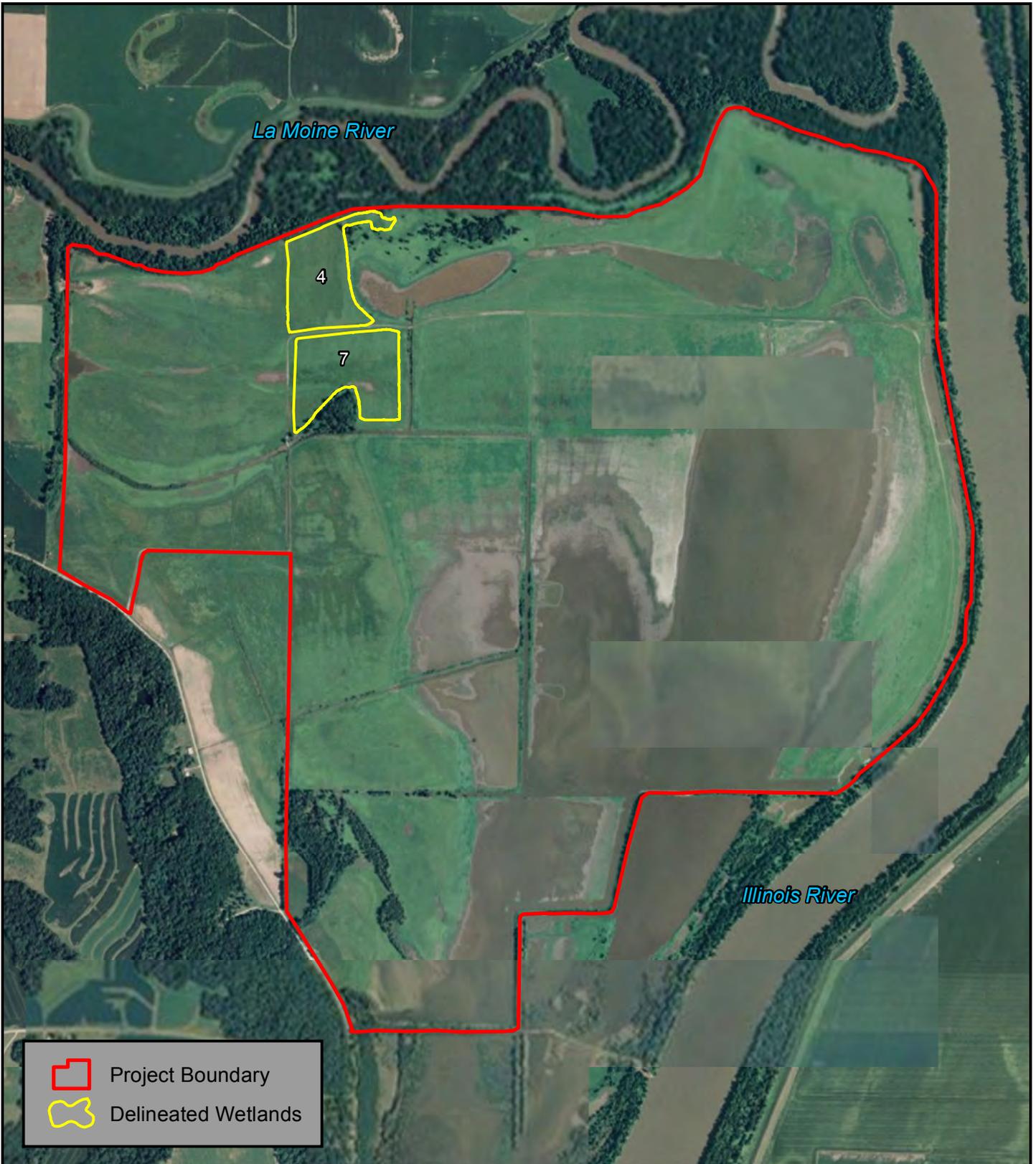
Allen Plocher, Dave Ketzner, Brian Wilm, and Brad Zercher  
University of Illinois  
Prairie Research Institute  
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Wetland Science Program  
1816 S. Oak St.  
Champaign, IL 61820  
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### **Introduction**

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. To facilitate agriculture, the hydrology of the site had been modified; however, since establishment of the bank, pumps have been removed and portions of the tile and ditch systems have been deactivated or plugged. For organizational and management purposes, the site has been arbitrarily divided into 16 Areas; Areas 4 and 7 are shown in Figure 1.

In the fall of 2006, Areas 4 and 7 on the upper floodplain were planted with trees (five foot container grown). Species planted were *Quercus palustris*, *Quercus bicolor*, *Carya illinoensis*, *C. laciniosa* and *C. ovalis*. About 3191 trees were planted on approximately 41 acres. The understory was to be seeded with a mix of *Agrostis gigantea*, *Phleum pratense*, *Lolium perenne*, *Cinna arundinacea*, *Elymus virginicus*, *Rudbeckia laciniata* and *Polygonum punctatum*. The Illinois Natural History Survey (INHS) was tasked to monitor planted tree survival and conduct qualitative assessments of understory vegetation beginning in 2007. This area was in row crops until fall of 2006 (Busemeyer and Plocher 2004, Busemeyer and Plocher 2005).

In 2011, field monitoring was conducted on 19 October; this report details the results of this 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 (ISGS) and INHS.



 Project Boundary  
 Delineated Wetlands

 **ILLINOIS**  
 UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN

**Wetland Science Program**  
 Illinois Natural History Survey  
 Prairie Research Institute  
 1816 South Oak Street  
 Champaign, Illinois 61820

**Site Boundaries and Delineated Wetland Acreage - 2011**  
**LaGrange Mitigation Site**  
**Brown County**

Seq. No: 9579

0 Meters 500  
  
 1 : 18,000

0 Feet 1,500  
  
 1 inch : 1,500 feet

02/2012

Figure 1



## **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 United States Army Corps of Engineers (USACOE) 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:** For Areas 4 and 7 specifically, the goal is to create forested wetland, 19.18 acres for Area 4 and 22.14 acres for Area 7.

**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 wetland. The wetland compensation should be composed of vegetation characteristic of forested 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 species. At least 75% of plant cover should be native. None of the three most dominant species in any stratum should be non-native, or weedy species.

## Methods

Monitoring of tree plantings in Areas 4 and 7 began in 2007 and is expected to continue for five years. The ISGS 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:** The created wetland site should be determined to be jurisdictional by current federal standards.

Wetland areas will be mapped in the field, and boundaries overlain on DOQs using ArcGIS.

A. 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.

B. 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. Wetland Hydrology – The ISGS will monitor site hydrology through a combination of wells, data loggers, and rain gages. More detailed information can be found in their annual report (Miner et al. 2011). The following is summarized from Miner et al. (2011). Wetland hydrology occurs when inundation or saturation to land surface is present for greater than 5% of the growing season 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 to satisfy the wetland hydrology criteria (Environmental Laboratory 1987). In addition, INHS scientists will survey the site annually for field indicators of wetland hydrology.

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

A. Tree Survival – Planted trees were to be tallied in 30 meter planted row sections at 302 meter intervals for a 10% total sample. Each tallied tree was to be identified to species.

B. Vegetation – Species composition and dominant plant species will be determined by meander surveys. Native plant cover will also be estimated using this method. A comprehensive species list will be generated for the two areas combined. Weedy species will be defined as those having a Coefficient of Conservatism (C) of 1 or 0. A Floristic Quality Index (FQI) will be computed annually (Taft et al 1997). 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 Mohlenbrock (2002).

## Results

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

A. Hydrophytic Vegetation – All dominant plants species are hydrophytic (*Echinochloa muricata*, *Xanthium strumarium*, *Cyperus esculentus*, *Eragrostis hypnoides*, and *Aster lanceolatus*).

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, Areas 4 and 7, as well as virtually the entire mitigation bank is underlain by hydric soils (IDOT 2002). Soils are considered to be unchanged since the initial examination. More detailed soils information can be found in the wetland determination form (Appendix A).

C. Wetland Hydrology – In 2011, all areas of Areas 4 and 7 conclusively supported wetland hydrology. According to the ISGS, virtually the entire wetland mitigation bank supported wetland hydrology, based on the 12.5% of the growing season criterion (Miner et al. 2011). Areal extent of wetland hydrology is shown in Figure 2.

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

A. Tree Survival - A tree count was not conducted in 2011. Based on the previous year’s count, less than 1% of planted trees survive (Plocher et al. 2010). Planted tree survival is far below the required performance criterion of 80%.

# La Grange Wetland Mitigation Bank

## Estimated Areal Extent of 2011 Wetland Hydrology

September 1, 2010 through August 31, 2011

Map based upon Illinois National Agriculture Imagery Program (NAIP) digital orthophotograph, Cooperstown NE quarter quadrangle, taken August 8, 2010 (USDA-FSA 2010)

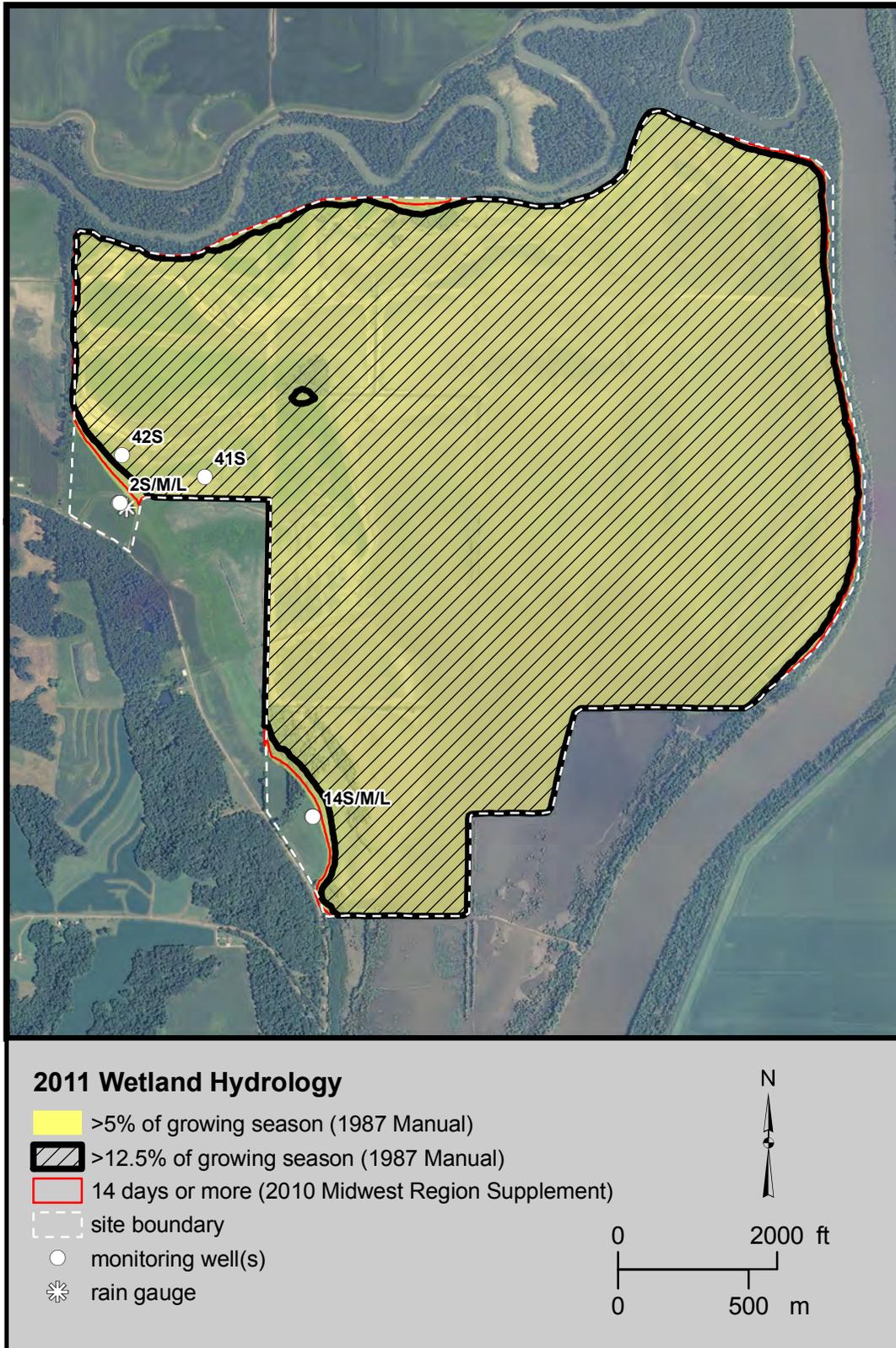


Figure 2. Areal extent of wetland hydrology, 2011 (Miner et al. 2011).

B. Vegetation – In 2011, 48% of plant species present (when excluding planted species) were non-weedy and native, far under the 90% required by the performance criterion. All three of the most dominant species (*Echinochloa muricata*, *Xanthium strumarium* and *Cyperus esculentus*) were weedy natives, conflicting with the performance criterion requiring that none of the three most dominant species be non-native or weedy. Since all dominant species and 89% of all species overall were native, it is assumed that at least 75% of plant cover is native, thereby meeting the performance criterion. FQI was 13.3 in 2011, essentially unchanged from the previous year (Plocher et al. 2010).

### **Summary and Recommendations**

In 2011, all areas within Areas 4 and 7 were determined to have dominant hydrophytic vegetation, hydric soils, and wetland hydrology and were therefore determined to be jurisdictional wetland. Total wetland acreage was 19.18 acres for Area 4 and 22.14 acres for Area 7 (Figure 1).

Planted tree survival is now under 1%, far below the required performance criterion of 80%. If the performance criterion is to be met, extensive replanting will be required. Based on the very poor survival of planted trees, it appears that meeting the performance criterion may be unlikely, even with replanting.

Plant cover appears to be strongly dominated by native species, thereby meeting the performance criterion. However, only 48% percent of plant species present were non-weedy and native and all three of the most dominant plant species were weedy natives. These data strongly conflict with the required performance criteria. As these areas are continually disturbed by severe flooding, it remains to be seen whether or not mature, native, non-weedy plant communities will ever develop.

### Literature Cited

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**Appendix A – Wetland Determination Form**

## ROUTINE ON-SITE WETLAND DETERMINATION

Areas 4 and 7 (page 1 of 3)

**Field Investigators:** Plocher, Ketzner, Keene      **Date:** 19 October 2011  
**Sequence No:** 9579      **Project Name:** LaGrange/Brown County Mitigation Bank  
**State:** Illinois      **County:** Brown      **Applicant:** IDOT District 6  
**Legal Description:** Section 17, T. 1 S., R. 1 W.

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. <i>Echinochloa muricata</i>	herb	OBL
2. <i>Xanthium strumarium</i>	herb	FAC
3. <i>Cyperus esculentus</i>	herb	FACW
4. <i>Eragrostis hypnoides</i>	herb	OBL
5. <i>Aster lanceolatus</i>	herb	FACW

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

**Hydrophytic vegetation:** Yes: X      No:

**Rationale:** More than 50% of dominants are OBL, FACW, FAC+, or FAC.

### SOILS

(originally described in 2000) (IDOT 2002)

Series and phase: Mapped as Beaucoup silty clay loam, Titus silty clay loam and Wagner silt 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 5/1

Other indicators: level landscape position on an active floodplain

**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

Areas 4 and 7 (page 2 of 3)

**Field Investigators:** Plocher, Ketzner, Keene      **Date:** 19 October 2011  
**Sequence No:** 9579      **Project Name:** LaGrange/Brown County Mitigation Bank  
**State:** Illinois      **County:** Brown      **Applicant:** IDOT District 6  
**Legal Description:** Section 17, T. 1 S., R. 1 W.

### HYDROLOGY

Inundated: Yes:      No: X      Depth of standing water: NA

Depth to saturated soil: > 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.

Watershed data: This site is in the watershed of the Illinois River, which has a drainage area of 62,748 km<sup>2</sup> (24,227 mi<sup>2</sup>) at Beardstown, IL (Ogata 1975). The U.S. Geological Survey hydrologic unit code (HUC) is 07130011 - Illinois River, Lower.

Other field evidence observed: depressional landscape position within an active floodplain, drift lines, bare areas

**Wetland hydrology:** Yes: X No:

**Rationale:** ISGS well data (Miner et al. 2011), along with 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 area is coded as upland in the NWI.

Determined by: Allen Plocher (vegetation and hydrology)  
 Dave Ketzner (vegetation, hydrology, and GPS)  
 Dennis Keene (soils and hydrology)  
 University of Illinois  
 Prairie Research Institute  
 Illinois Natural History Survey  
 Wetland Science Program  
 1816 S. Oak St.  
 Champaign, IL 61820  
 (217) 333-6292 (Plocher)

## ROUTINE ON-SITE WETLAND DETERMINATION

Areas 4 and 7 (page 3 of 3)

**Field Investigators:** Plocher, Ketzner, Keene      **Date:** 19 October 2011  
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### SPECIES LIST

Scientific name	Common name	Stratum	Wetland indicator status	C**
<i>Abutilon theophrasti</i>	velvet leaf	herb	FACU-	*
<i>Acer saccharinum</i>	silver maple	herb	FACW	1 <sup>^</sup>
<i>Amaranthus tuberculatus</i>	water hemp	herb	OBL	1 <sup>^</sup>
<i>Ambrosia trifida</i>	giant ragweed	herb	FAC+	0 <sup>^</sup>
<i>Aster lanceolatus</i>	panicked aster	herb	FACW	3
<i>Boltonia asteroides</i>	false aster	herb	FACW	5
<i>Campsis radicans</i>	trumpet creeper	herb	FAC	2
<i>Carya illinoensis</i>	pecan	herb	(planted)	6
<i>Cephalanthus occidentalis</i>	buttonbush	shrub	OBL	4
<i>Cuscuta polygonorum</i>	smartweed dodder	herb	UPL	5
<i>Cyperus esculentus</i>	red rooted flatsedge	herb	OBL	1 <sup>^</sup>
<i>Echinochloa muricata</i>	barnyard grass	herb	OBL	0 <sup>^</sup>
<i>Eragrostis hypnoides</i>	creeping lovegrass	herb	OBL	5
<i>Eragrostis pectinacea</i>	Carolina love grass	herb	FAC	0 <sup>^</sup>
<i>Foresteira acuminata</i>	swamp privet	herb	OBL	6
<i>Fraxinus lanceolata</i>	green ash	herb	FACW	2
<i>Ipomoea hederacea</i>	ivy leaf morning glory	herb	FAC	*
<i>Ipomoea lacunosa</i>	small white morning glory	herb	FACW	1 <sup>^</sup>
<i>Panicum capillare</i>	witch grass	herb	FAC	0 <sup>^</sup>
<i>Panicum dichotomiflorum</i>	fall panicum	herb	FACW-	0 <sup>^</sup>
<i>Persicaria amphibium</i>	water smartweed	herb	OBL	3
<i>Persicaria pensylvanica</i>	giant smartweed	herb	FACW+	1 <sup>^</sup>
<i>Populus deltoides</i>	cottonwood	herb	FAC+	2
<i>Quercus bicolor</i>	swamp white oak	shrub	(planted)	7
<i>Quercus palustris</i>	pin oak	shrub	(planted)	4
<i>Rorippa palustris palustris</i>	marsh yellow cress	herb	OBL	4
<i>Rorippa sessiliflora</i>	sessile flowered cress	herb	OBL	3
<i>Salix nigra</i>	black willow	shrub	OBL	3
<i>Sida spinosa</i>	prickly sida	herb	FACU	*
<i>Xanthium strumarium</i>	cocklebur	herb	FAC	0 <sup>^</sup>

\*\*Coefficient of Conservatism (Taft et al. 1997)

\* Non-native species

<sup>^</sup> Weedy, native species

Percent native: 24/27=89%

(excluding planted species)

Percent native and non-weedy: 13/27= 48%

(excluding planted species)

mCv with planted species=  $\sum C/N = 69/27 = 2.6$

FQI with planted species =  $\sum C/\sqrt{N} = 69/\sqrt{27}=13.3$

mCv without planted species=  $\sum C/N = 52/24 = 2.2$

FQI without planted species =  $\sum C/\sqrt{N} = 52/\sqrt{24}=10.6$