

TRANSMITTAL FORM

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

Route and Location

Mark: La Grange Mitigation Bank Site
 County: Brown
 IDOT District: 6
 Sequence Number: 9579

Survey Conducted By: Allen Plocher, Rick Larimore, Dennis Keene and Brad Zercher
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Date Conducted: 2, 3, 9, 11 September 2008

Project Summary:

We conducted the third year of quantitative vegetation monitoring for Areas 1, 2 and 3 of the La Grange Mitigation Bank Site (qualitative vegetation assessment was carried out in 2004 and 2005). The attached report includes information detailing monitoring methods and results. The status of the created wetland site is discussed. The created wetland site is overlain on digital ortho-quad photography (DOQ) using Arcview 3.2. This report has been posted on the IDOT ftp site as well as submitted as a hard copy.

Signed: _____

Dr. Allen E. Plocher
 INHS/IDOT project Coordinator

Date: _____

Signed: _____

Dr. Edward J. Heske
 INHS/IDOT project principal investigator

Date: _____

Wetland Mitigation Monitoring for the La Grange Mitigation Bank Site, Areas 1, 2 and 3 - 2008

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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. Area 2 (other than Horseshoe Lake) has 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).

In 2008, field monitoring was conducted on 2, 3, 9 and 11 September. This report details results of the 2008 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 75% of the plant species present should be non-weedy, native, annual and perennial species. 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, began quantitative vegetation monitoring in 2006, and will continue 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 (relative frequency, relative cover, and Importance Value) will be determined annually through quantitative vegetation sampling of permanent plots. Seventeen parallel transects were established at 200 m (656 ft) intervals. Sampling points (70) were established at 200 m (656 ft) intervals on each transect (Due to severe flooding in September, 31 vegetated points and 10 open water points were sampled in 2008). At each sampling point, vegetation was tallied by species and percent cover in 20 m² quadrats. For the upper floodplain, planted trees and shrubs and natural regeneration will be tallied in 30.2 m planted row sections at 302 m intervals (10% sample). Beginning when woody vegetation approximates 20% cover, these data will be used to determine woody species composition. 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).

C. 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 2008). 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>]). Inundation and saturation at the site were monitored using a combination of 32 monitoring wells and 10 stage gauges. Water levels were measured at least biweekly during April and May, and monthly during the remainder of the year. Manual readings are generally supplemented by 4 dataloggers, which measure surface and ground-water levels at regular intervals to document all hydrologic events. In 2007, however, no dataloggers were deployed due to extensive on-site flooding, and hence, on-site water level readings were augmented by data from a nearby stream gauging station. Additional details regarding site conditions and monitoring results for wetland hydrology in 2008 are summarized in ISGS' Annual Report for Active IDOT Wetland Compensation and Hydrologic Monitoring Sites, September 1, 2007 to October 10, 2008 (Carr 2008).

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 quantitative sampling. In the upper floodplain area, dominant shrub/sapling layer species will be determined by quantitative sampling, while dominant herbaceous 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 75% 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).

Results

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

In Areas 1, 2 and 3 of the lower floodplain, three plant communities were identified in 2008. 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 *Echinochloa muricata* (OBL), *Cyperus ferruginescens*

(OBL) and *Polygonum amphibium* (OBL). At slightly higher elevations, occupying depressions and meander scars, there is marsh (C), dominated by *Polygonum amphibium* (OBL). The remainder of the lower floodplain is a wet forbland (Area D) dominated by *Xanthium strumarium* (FAC), *Boltonia asteroides* (FACW) and *Echinochloa muricata* (OBL). In 2008, all plant communities on the lower floodplain have hydrophytic vegetation. The entire lower floodplain is underlain by hydric soils (figure 2, Appendix 1).

In 2008, precipitation was 137% of normal at the La Grange Bank Site. In September, precipitation was 315% of normal. There were flood events in January and February, and prolonged floods in June and September. In 2008, 1248 out of 1643 acres conclusively supported wetland hydrology (12.5% of growing season), and 1384 acres may support wetland hydrology (5% of growing season). The entire lower floodplain (761 acres), conclusively supported wetland hydrology in 2008 (figure 1) (Carr 2008).

Former Wessel Property, La Grange Wetland Bank Site
Estimated Areal Extent of 2008 Wetland Hydrology

based on data collected between September 1, 2007 and October 10, 2008
 map based upon USGS digital orthophotograph, Cooperstown NE quarter quadrangle,
 produced from 4/14/98 aerial photography (ISGS 2002)

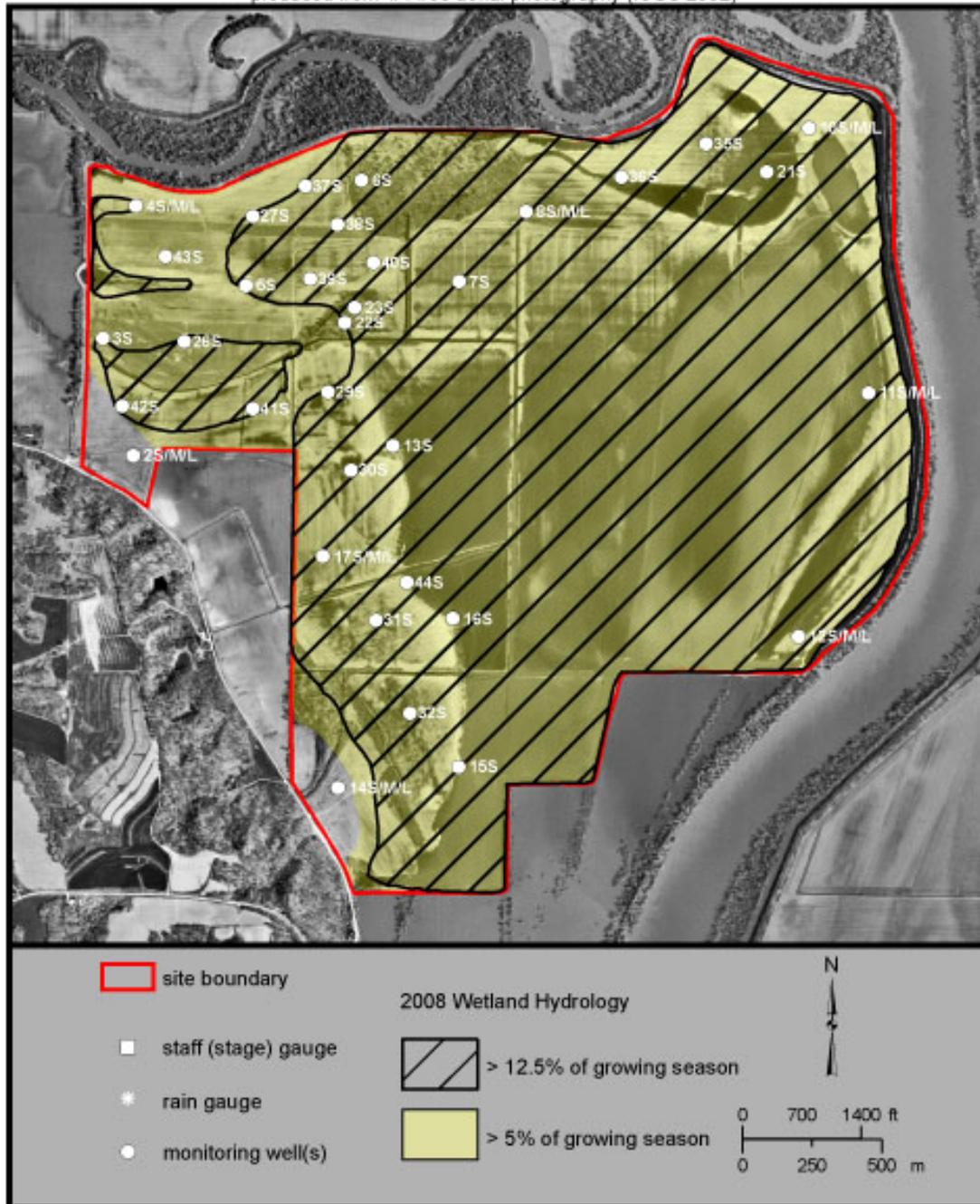


figure 1. Estimated extent of 2008 wetland hydrology

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

Vegetation

In 2008, multiple severe floods increased the area of open water and set back vegetation to an earlier successional stage. The open water area (Community A) increased from 179 acres to 318 acres. Due to more permanent open water, this area supported 3.5 acres of *Nelumbo lutea* – *Hibiscus laevis* (Community A1). Thousands of waterfowl were again observed. Adjacent to open water, there was a smaller area of mudflat this year (33.4 acres), dominated by *Echinochloa muricata*, *Cyperus ferruginescens* and *Polygonum amphibium*. Due to flood-induced disturbance, FQI in this area decreased from 23.5 to 12.7 and percent nonweedy native species decreased from 86.3% to 78.3%. The marsh (Community C) (52.6 acres) was still dominated by *Polygonum amphibium*, but FQI decreased from 15.6 to 13.2, although percent nonweedy native species increased from 69% to 78.6%. The stands of *Sparganium eurycarpum* observed in 2007 were no longer present. The wet forbland (Community D) was again the plant community occupying the largest part of Areas 1, 2 and 3 (353.5 acres). Due to disturbance, this community is now dominated by *Xanthium strumarium*, *Boltonia asteroides* and *Echinochloa muricata* and the number of species present decreased from 61 to 47. However, FQI and percent nonweedy native species remain about the same (13.6, 55.3%). The increase in flooding resulted in a decrease in percent upland species (from 21% to 13%) (Plocher et al. 2007). Perhaps due to the increase in flooding, the State and Federally listed *Boltonia decurrens* was present in 2008 (17 individuals were observed in Areas 1 and 2). The weedy *Phalaris arundinacea* is still present but not abundant (Table 1, 2 and 3, Appendix 1, figure 2).

Table 1. Understory species composition of Mudflat (Community B). Freq., Rel. Freq., Cover (m^2/m^2), Rel. Cover, Importance Value (%), N=4.

Species	Freq.	Rel. Freq.	Cover	Rel. Cov.	I.V.
<i>Echinochloa muricata</i>	1.000	0.2667	0.3500	0.3944	33.06
<i>Cyperus ferruginescens</i>	0.750	0.2000	0.2125	0.2394	21.97
<i>Polygonum amphibium</i>	0.750	0.2000	0.1750	0.1972	19.86
<i>Xanthium strumarium</i>	0.500	0.1333	0.0750	0.0845	10.89
<i>Aster simplex</i>	0.500	0.1333	0.0375	0.0423	8.78
<i>Eleocharis smallii</i>	0.250	0.0667	0.0375	0.0423	5.45
Total	3.750	1.0000	0.8875	1.0001	100.01

Table 2. Understory species composition of Marsh (Community C). Freq., Rel. Freq., Cover (m^2/m^2), Rel. Cover, Importance Value (%), N=7.

Species	Freq.	Rel. Freq.	Cover	Rel. Cov.	I.V.
<i>Polygonum amphibium</i>	1.0000	0.700	0.8714	0.9682	83.41
<i>Lemna minor</i>	0.2857	0.200	0.0143	0.0159	10.80
<i>Scirpus fluviatilis</i>	0.1429	0.100	0.0143	0.0159	5.79
Total	1.4286	1.000	0.9000	1.0000	100.00

Table 3. Understory species composition of Wet Forbland (Community D). Freq., Rel. Freq., Cover (m^2/m^2), Rel. Cover, Importance Value (%), N=20.

Species	Freq.	Rel. Freq.	Cover	Rel. Cov.	I.V.
<i>Xanthium strumarium</i>	0.950	0.2159	0.3575	0.2889	25.24
<i>Boltonia asteroides</i>	0.950	0.2159	0.1950	0.1576	18.67
<i>Echinochloa muricata</i>	0.750	0.1705	0.2425	0.1960	18.32
<i>Cyperus ferruginescens</i>	0.550	0.1250	0.1400	0.1131	11.91
<i>Aster simplex</i>	0.500	0.1136	0.1300	0.1051	10.93
<i>Polygonum amphibium</i>	0.250	0.0568	0.1175	0.0949	7.59
<i>Polygonum pensylvanicum</i>	0.100	0.0227	0.0150	0.0121	1.74
<i>Amaranthus tuberculatus</i>	0.100	0.0227	0.0125	0.0101	1.64
<i>Cassia fasciculata</i>	0.050	0.0114	0.0125	0.0101	1.08
<i>Bidens frondosa</i>	0.050	0.0114	0.0050	0.0040	0.77
<i>Phyla lanceolata</i>	0.050	0.0114	0.0050	0.0040	0.77
<i>Ipomoea lacunosa</i>	0.050	0.0114	0.0025	0.0020	0.67
<i>Apocynum sibiricum</i>	0.050	0.0114	0.0025	0.0020	0.67
Total	4.400	1.0001	1.2375	0.9999	100.00

Summary and Recommendations

In 2008, after two severe growing season floods, all of Areas 1, 2, and 3 (761 acres) again had measured wetland hydrology. Even greater areas of open water were present, providing excellent waterfowl habitat. In all, there were 443 acres of vegetated wetland and 318 acres of open water. Due to the extreme flooding, Floristic Quality decreased in the mudflat community (23.5 to 12.7), and in the marsh community (15.6 -13.2). The mudflat and wet forbland now have weedy species among the three most dominant (*Echinochloa muricata*, *Xanthium strumarium*, *Cyperus ferruginescens*) and species diversity has decreased in all communities. In the mudflat and marsh, however, greater than 75% of the species present were native and nonweedy. In Community D (wet forbland) only 55.3% of species present are native and nonweedy. The State and Federally listed *Boltonia decurrens* reappeared this year. *Phalaris arundinacea* is present but not abundant. 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 and 3. Hydrophytic vegetation, hydric soils and wetland hydrology are all present. Therefore this site is a wetland. The site occupies 13.5 ha (33.4 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 PEMFh, L2EM2Gh or L1UBHh. The FQI is 12.7, which is indicative of fair natural quality.

Site C: This marsh is located in depressions within Areas 1, 2 and 3. Hydrophytic vegetation, hydric soils and wetland hydrology are all present. Therefore these sites are wetland. The sites occupy 21.3 ha (52.6 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 13.2, which is indicative of fair natural quality.

Site D: This wet forbland is located in Areas 1, 2 and 3. Hydrophytic vegetation, hydric soils and wetland hydrology are all present. Therefore these sites are wetland. The sites occupy 143.1 ha (353.5 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 PEMA, PEMAh, PEMC, PEMCh, PEMFh, L2EM2Gh or L1UBHh, and parts of the sites are not coded as wetland. The FQI is 13.6, 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 km² (24,227 mi²) 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, Larimore, Keene **Date:** 3, 9 September 2008

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., S/2, Sect. 16, Sect. 21, E/2 SE/4 Sect. 20

Location: Areas 1 and 3

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>Cyperus ferruginescens</i>	herb	OBL
3. <i>Polygonum amphibium</i>	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, Larimore, Keene **Date:** 3, 9 September 2008

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., S/2, Sect. 16, Sect. 21, E/2 SE/4 Sect. 20

Location: Areas 1 and 3

HYDROLOGY

Inundated: Yes: X (in places) No: Depth of standing water: 0 - 0.38 m (0 -15 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 km² (24,227 mi²) 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 PEMFh, L2EM2Gh or L1UBHh (palustrine, emergent, semipermanently flooded, diked/impounded) or lacustrine, littoral/limnetic, emergent/unconsolidated bottom intermittently exposed/permanently flooded, diked/impounded,).

Determined by: Allen Plocher (vegetation and hydrology)
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ROUTINE ON-SITE WETLAND DETERMINATION

Site B (page 3 of 3)

Field Investigators: Plocher, Larimore, Keene **Date:** 3, 9 September 2008

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., S/2, Sect. 16, Sect. 21, E/2 SE/4 Sect. 20

Location: Areas 1 and 3

SPECIES LIST

Scientific name	Common name	Stratum	Wetland indicator status	C=
<i>Amaranthus tuberculatus</i>	water hemp	herb	OBL	1
<i>Apocynum sibiricum</i>	dogbane	herb	FAC+	2
<i>Aster simplex</i>	panicked aster	herb	FACW	3
<i>Bidens connata</i>	beggar's ticks	herb	OBL	2
<i>Bidens frondosa</i>	beggar's ticks	herb	FACW	1
<i>Boltonia asteroides</i>	false aster	herb	FACW	5
<i>Cephalanthus occidentalis</i>	buttonbush	shrub	OBL	4
<i>Cyperus ferruginescens</i>	flatsedge	herb	OBL	1
<i>Echinochloa muricata</i>	barnyard grass	herb	OBL	0
<i>Eleocharis erythropoda</i>	red rooted spikerush	herb	OBL	3
<i>Eleocharis obtusa</i>	spikerush	herb	OBL	2
<i>Eleocharis smallii</i>	spikerush	herb	OBL	5
<i>Hibiscus laevis</i>	halberd leaf rose mallow	herb	OBL	4
<i>Ipomoea lacunosa</i>	small white morning glory	herb	FACW	1
<i>Lemna minor</i>	duckweed	herb	OBL	3
<i>Ludwigia peploides</i>	creeping primrose willow	herb	OBL	5
<i>Polygonum amphibium</i>	water smartweed	herb	OBL	3
<i>Populus deltoides</i>	cottonwood	seedling	FAC+	2
<i>Rorippa islandica</i>	marsh yellow cress	herb	OBL	4
<i>Salix nigra</i>	black willow	shrub	OBL	3
<i>Scirpus fluviatilis</i>	river bulrush	herb	OBL	3
<i>Scirpus validus</i>	great bulrush	herb	OBL	4
<i>Xanthium strumarium</i>	cocklebur	herb	FAC	0

= Coefficient of Conservatism (Taft et al. 1997)

* Non-native species

Percent weedy or nonnative: 5/23 = 21.7%

$$mCv = \sum C/N = 61/23 = 2.65$$

$$FQI = \sum C/\sqrt{N} = 61/\sqrt{23} = 12.7$$

Quality = fair

ROUTINE ON-SITE WETLAND DETERMINATION

Site C (page 1 of 3)

Field Investigators: Plocher, Larimore, Keene **Date:** 2, 9 September 2008

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, 2 and 3

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>Polygonum amphibium</i>	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, Larimore, Keene **Date:** 2, 9 September 2008
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, 2 and 3

HYDROLOGY

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

Depth to saturated soil: 0 – 0.38 m (0 - 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 is the major output.

Size of watershed: 62,748 km² (24,227 mi²) 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, Larimore, Keene **Date:** 2, 9 September 2008

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, 2 and 3

SPECIES LIST

Scientific name	Common name	Stratum	Wetland indicator status	C=
<i>Acer saccharinum</i>	silver maple	shrub/seedling	FACW	1
<i>Amaranthus tuberculatus</i>	water hemp	herb	OBL	1
<i>Ammannia coccinea</i>	ammannia	herb	OBL	5
<i>Apocynum sibiricum</i>	dogbane	herb	FAC+	2
<i>Asclepias incarnata</i>	swamp milkweed	herb	OBL	4
<i>Aster simplex</i>	panicled aster	herb	FACW	3
<i>Bidens aristosa</i>	beggar's ticks	herb	FACW	1
<i>Bidens connata</i>	beggar's ticks	herb	OBL	2
<i>Bidens frondosa</i>	beggar's ticks	herb	FACW	1
<i>Boehmeria cylindrica</i>	false nettle	herb	OBL	3
<i>Boltonia asteroides</i>	false aster	herb	FACW	5
<i>Cephalanthus occidentalis</i>	buttonbush	shrub	OBL	4
<i>Cyperus ferruginescens</i>	flatsedge	herb	OBL	1
<i>Echinochloa muricata</i>	barnyard grass	herb	OBL	0
<i>Hibiscus laevis</i>	halberd leaf rose mallow	herb	OBL	4
<i>Ipomoea lacunosa</i>	small white morning glory	herb	FACW	1
<i>Lemna minor</i>	duckweed	herb	OBL	3
<i>Leucospora multifida</i>	leucospora	herb	FACW+	3
<i>Ludwigia peploides</i>	creeping primrose willow	herb	OBL	5
<i>Nelumbo lutea</i>	American lotus	herb	OBL	5
<i>Polygonum amphibium</i>	water smartweed	herb	OBL	3
<i>Polygonum pensylvanicum</i>	giant smartweed	herb	FACW+	1
<i>Populus deltoides</i>	cottonwood	seedling	FAC+	2
<i>Sagittaria latifolia</i>	arrowhead	herb	OBL	4
<i>Salix exigua</i>	sandbar willow	shrub	OBL	1
<i>Scirpus fluviatilis</i>	river bulrush	herb	OBL	3
<i>Vitis riparia</i>	riverbank grape	herb	FACW-	2
<i>Xanthium strumarium</i>	cocklebur	herb	FAC	0

= Coefficient of Conservatism (Taft et al. 1997)

* Non-native species

Percent weedy or nonnative: 6/28 = 21.4%

$$mCv = \sum C/N = 70/28 = 2.50$$

$$FQI = \sum C/\sqrt{N} = 70/\sqrt{28} = 13.2$$

Quality = fair

ROUTINE ON-SITE WETLAND DETERMINATION

Site D (page 1 of 4)

Field Investigators: Plocher, Larimore, Keene **Date:** 2, 3, 9, 11 September 2008

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 SE/4 Sect. 20

Location: Areas 1, 2 and 3

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>Xanthium strumarium</i>	herb	FAC
2. <i>Boltonia asteroides</i>	herb	FACW
3. <i>Echinochloa muricata</i>	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, Larimore, Keene **Date:** 2, 3, 9, 11 September 2008

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 SE/4 Sect. 20

Location: Areas 1, 2 and 3

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 km² (24,227 mi²) at Beardstown, IL

Other field evidence observed: level to depression 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 PEMA, PEMAh, PEMC, PEMCh, PEMFh (palustrine, 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, Larimore, Keene **Date:** 2, 3, 9, 11 September 2008

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 SE/4 Sect. 20

Location: Areas 1, 2 and 3

SPECIES LIST

Scientific name	Common name	Stratum	Wetland indicator status	C=
<i>Abutilon theophrasti</i>	velvet leaf	herb	FACU-	*
<i>Amaranthus tuberculatus</i>	water hemp	herb	OBL	1
<i>Ambrosia artemisiifolia</i>	common ragweed	herb	FACU	0
<i>Ambrosia trifida</i>	giant ragweed	herb	FAC+	0
<i>Ammannia coccinea</i>	ammannia	herb	OBL	5
<i>Apocynum sibiricum</i>	dogbane	herb	FAC+	2
<i>Asclepias incarnata</i>	swamp milkweed	herb	OBL	4
<i>Aster simplex</i>	panicled aster	herb	FACW	3
<i>Bidens aristosa</i>	beggar's ticks	herb	FACW	1
<i>Bidens connata</i>	beggar's ticks	herb	OBL	2
<i>Bidens frondosa</i>	beggar's ticks	herb	FACW	1
<i>Boltonia asteroides</i>	false aster	herb	FACW	5
<i>Boltonia decurrens</i>	decurent false aster	herb	OBL	4
<i>Campsis radicans</i>	trumpet creeper	herb	FAC	2
<i>Carex lacustris</i>	lake sedge	herb	OBL	6
<i>Cassia fasciculata</i>	partridge pea	herb	FACU-	1
<i>Cephalanthus occidentalis</i>	buttonbush	shrub	OBL	4
<i>Chamaesyce humistrata</i>	milk spurge	herb	FACW	1
<i>Cyperus ferruginescens</i>	flatsedge	herb	OBL	1
<i>Echinochloa muricata</i>	barnyard grass	herb	OBL	0
<i>Eleocharis erythropoda</i>	red rooted spikerush	herb	OBL	3
<i>Eragrostis pectinacea</i>	Carolina lovegrass	herb	FAC	0
<i>Eupatorium serotinum</i>	late flowering thoroughwort	herb	FAC+	1
<i>Hibiscus laevis</i>	halberd leaf rose mallow	herb	OBL	4

= 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, Larimore, Keene **Date:** 2, 3, 9, 11 September 2008

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 SE/4 Sect. 20

Location: Areas 1, 2 and 3

SPECIES LIST (Continued)

Scientific name	Common name	Stratum	Wetland indicator status	C=
<i>Ipomoea lacunosa</i>	small white morning glory	herb	FACW	1
<i>Iva annua</i>	sumpweed	herb	FAC	0
<i>Leersia oryzoides</i>	rice cutgrass	herb	OBL	3
<i>Oxalis stricta</i>	yellow wood sorrel	herb	FACU	0
<i>Panicum capillare</i>	witch grass	herb	FAC	0
<i>Panicum dichotomiflorum</i>	fall panicum	herb	FACW-	0
<i>Phalaris arundinacea</i>	reed canarygrass	herb	FACW+	*
<i>Phyla lanceolata</i>	fog fruit	herb	OBL	1
<i>Polygonum amphibium</i>	water smartweed	herb	OBL	3
<i>Polygonum lapathifolium</i>	nodding smartweed	herb	FACW+	0
<i>Polygonum pensylvanicum</i>	giant smartweed	herb	FACW+	1
<i>Populus deltoides</i>	cottonwood	shrub	FAC+	2
<i>Portulaca oleracea</i>	purslane	herb	FAC-	*
<i>Sagittaria latifolia</i>	arrowhead	herb	OBL	4
<i>Salix amygdaloides</i>	peach leaf willow	shrub	FACW	4
<i>Salix exigua</i>	sandbar willow	shrub	OBL	1
<i>Salix nigra</i>	black willow	shrub	OBL	3
<i>Scirpus fluviatilis</i>	river bulrush	herb	OBL	3
<i>Sida spinosa</i>	prickly sida	herb	FACU	*
<i>Sium suave</i>	water parsnip	herb	OBL	5
<i>Stachys tenuifolia</i>	slenderleaf betony	herb	OBL	5
<i>Vitis riparia</i>	riverbank grape	herb	FACW-	2
<i>Xanthium strumarium</i>	cocklebur	herb	FAC	0

= Coefficient of Conservatism (Taft et al. 1997)

$$mCv = \sum C/N = 89/43 = 2.07$$

* Non-native species

$$FQI = \sum C/\sqrt{N} = 89/\sqrt{43} = 13.6 \quad \text{Quality} = \text{fair}$$

Percent weedy or nonnative: 21/47 = 44.7%