TRANSMITTAL

To: Bureau of Design and Environment
Attn: Matthew J. Sunderland
From: Illinois Natural History Survey
Topic: Mitigation Monitoring

Route and Location

Project Name: FAP 301 (US 20)(west Freeport bypass)
County: Stephenson
Job Number: P92-029-02
Sequence Number: 10487
Section Number: 177-2
Location: At the wetland compensation site near the Jane Addams Bike Trail; ISGS Site 6W

Surveys Conducted by: Jesse Kurylo, Jeff Matthews, Jason Zylka, Brian Wilm, Brad Zercher (figure)
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Date Conducted: 11 August 2009

Project Summary:

We conducted the third year of monitoring of a site for wetland impact mitigation resulting from proposed construction and addition of lanes along the west Freeport bypass on US 20 in Stephenson County. The site involves the creation, restoration, and preservation of wetlands. The Illinois Department of Transportation established the site in 2006, planting trees. The attached report includes an explanation of monitoring methods and results. We also discuss the progress toward attaining project goals.

Signed:

Dr. Allen E. Plocher
INHS/IDOT Project Coordinator

Date: 1/12/10

Wetland Mitigation Monitoring Report for the FAP 301 (US 20 – Freeport bypass) site near the Jane Addams Trail (ISGS Site 6W), Stephenson County, Illinois (third monitoring year--2009)

Introduction

This report describes the third year of monitoring of a wetland created to mitigate for wetlands affected by the construction of another set of lanes for the FAP 301 (US 20) bypass around Freeport. The entire compensation site is 9.6 ha (23.6 acre) and the majority of that area is monitored for wetland creation (Figure 1, Appendix 2). Trees were planted on former agricultural fields in the floodplain of the Pecatonica River on 25 May 2006. A drainage-way was plugged with dirt and rocks near its outlet into the oxbow at the west edge of the site. This was completed on 27 September 2006. Its purpose was to hold water on the site for longer periods.

This report discusses the goals, objectives, and performance criteria for the mitigation project, the methods used for monitoring the site, and monitoring results. Methods and results are discussed for performance criteria for each goal. Photo stations were established and photos can be found in Appendix 3.

Goals, Objectives, and Performance Criteria

The goals, objectives, and performance criteria described below follow those listed in the request to monitor the site (Matthew J. Sunderland, IDOT, 9 November 2006). Each goal should be attained by the end of a five-year monitoring period.

Project Goal 1: The created wetland community should be a jurisdictional wetland as defined by current federal standards.

Objective: The created wetland will be formed through plugging a ditch that drained former crop fields on the site.

Performance criteria:

a. Predominance of hydrophytic vegetation: More than 50% of the dominant plant species must be hydrophytic.

b. Presence of hydric soils: Hydric soil characteristics should be present, or conditions favorable for hydric soil formation should persist at the site.

c. Presence of wetland hydrology: The area must be either permanently or periodically inundated at average depths less than 2 m (6.6 ft) or be saturated to the surface for at least 5% of the growing season when the site also meets the soils and vegetation criteria or 12.5% of the growing season if the other two criteria are not met.

Project Goal 2: The created wetland community should meet standards for floristic composition and vegetation cover.

Objective: A floodplain forest will be created by planting native woody species. Herbaceous vegetation will be allowed to colonize the site naturally.

Performance criteria:

a. Planted species survivorship: At the end of the five-year monitoring period, at least 55 planted trees per acre will be present and healthy in the created wetland site.

b. Native species composition: At the end of the five-year monitoring period, at least 50% of total species should be non-weedy, native perennial species.

c. Dominant plant species: None of the three most dominant plant species in the planned wetland should be non-native or weedy species, such as cattail, sandbar willow, or reed canary grass.

Methods

Project Goal 1

a) Predominance of hydrophytic vegetation

The method for determining dominant hydrophytic vegetation at a wetland site is described in the Corps of Engineers Wetlands Delineation Manual (Environmental Laboratory 1987), based on areal coverage estimates for individual plant species. Each of the dominant plant species is assigned its wetland indicator rating (Reed 1988). A plant species that is rated facultative or wetter (FAC, FAC+, FACW, or OBL) is considered to be hydrophytic. If more than 50% of the dominant species present are hydrophytic, this criterion of wetlands is met.

b) Occurrence of hydric soils

To monitor hydric soil development, the soil was sampled at various locations within each cover type in 2007. Soil profile morphology, including horizon color, texture, and structure was analyzed at representative points throughout the site. Additionally, the presence, type, size, and abundance of redoximorphic features were recorded. In the absence of hydric soil indicators, hydrologic data can be used to confirm that conditions favorable for hydric soil formation persist at the site (Environmental Laboratory 1987).

c) Presence of wetland hydrology

The extent of wetland hydrology at the Freeport Bypass West Potential Wetland Compensation Site 6W was monitored by the Illinois State Geological Survey and is shown on the accompanying figure (Fucciolo et al. 2009)(Appendix 2 in this report). Wetland hydrology occurs when inundation or saturation to land surface is present for greater than 5% of the growing season (9 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 (23 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 20 monitoring wells and 3 stage gauges. Water levels were measured at least biweekly during April and May, and monthly during the remainder of the year. Manual readings were supplemented by 2 dataloggers, which measure surface- and ground-water levels at regular intervals to document all hydrologic events. Additional

details regarding site conditions and monitoring results for wetland hydrology in 2009 are summarized in ISGS Annual Report for Active IDOT Wetland Compensation and Hydrologic Monitoring Sites, September 1, 2008 to September 1, 2009 (Fucciolo et al. 2009).

Project Goal 2

a) Planted species survivorship

In May 2006, saplings were planted on the two former crop fields within the wetland mitigation site at the rate of 100 per acre (IDOT Conceptual Wetland Compensation Plan, FAP 301, Section 177-2, March 2005, amended). All living planted trees were counted and assigned to species. Apparent dead stems of the planted species were also counted. Planted tree species tallied on the site were *Carya illinoensis, Fraxinus pennsylvanica, Platanus occidentalis, Quercus bicolor,* and *Quercus palustris. Juglans cinerea* had also been planted on the site as a grouping, but again this year, none were located.

b) Native species composition, and
c) Dominant plant species

The entire wetland mitigation site is comprised of two former crop fields, with existing wetland and buffer areas also present. Areas of existing wetland (floodplain forest and a wet meadow drainage-way) and areas where no efforts are being made to restore or create wetlands were excluded from monitoring. Therefore, only the two former crop fields where trees are planted were monitored this year.

A separate plant species list was made for each of the wetland determination sites, representing the different vegetation cover types of the site. Dominant plant species for each wetland determination site were determined by visual assessment of each area. Planted tree species were added to the species lists for the two wetland determination sites. *Fraxinus* is listed as planted but also occurs as volunteers on each site from nearby floodplain forest.

To calculate percent perennial, non-weedy native (PNWN) species, the total number of non-weedy (C value >1), native perennials was divided by the total number of species on the site. Trees were included as perennials, but biennials were excluded.

Included with the assessment of a site is the site's Floristic Quality Index, as described by Swink and Wilhelm (1994) and Taft *et al.* (1997). Although the Index is not a substitute for quantitative vegetation analysis in assessing plant communities, it provides a measure of the floristic integrity or level of disturbance of a site. Each plant species native to Illinois is assigned a rating between 0 and 10 (the Coefficient of Conservatism) that is a subjective indicator of how likely a plant may be found on an undisturbed site in a natural plant community. A plant species that has a low Coefficient of Conservatism (c) is likely to tolerate disturbed conditions; a species with a high c is likely to require specific, undisturbed habitats. Species that are not native to Illinois are not rated.

The Florisitic Quality Index (FQI) is calculated as follows: $FQI = R/\sqrt{N}$, where R represents the sum of the numerical ratings (C) for all species recorded for a site, and N represents the number of native plant species on the site. The mean C value (also known as mean rated quality) was

also calculated for each site. This value is calculated as follows: mCv = R/N. The C value for each species is shown in the species list for the site. Species not native to Illinois (indicated by ** in the species list for each site) are not included in calculations. An Index score below 10 suggests a site of low natural quality; below five, a highly disturbed site. A FQI value of 20 or more (mCv > 3.0) suggests that a site has evidence of native character and may be considered an environmental asset. Sites with FQI values of 35 of more (mCv > 3.5) are considered to be of natural area quality.

Results and discussion

Project goal 1

a) Predominance of hydrophytic vegetation

Dominant plant species for each of the wetland determination sites are presented in Tables 1 and 2. Both sites 1 and 2 had dominant hydrophytic vegetation this year. A full list of plant species observed is presented in the wetland determination forms at the end of this report (Appendix 1).

Table 1. Dominant plant species in the non-native grassland at wetland determination Site 1.

Dominant Plant Species	Indicator Status	Stratum
1. *Bidens frondosa*	FACW	herb
2. *Phalaris arundinacea*	FACW+	herb
3. *Setaria faberi*	FACU+	herb

Table 2. Dominant plant species in the wet meadow at wetland determination Site 2.

Dominant Plant Species	Indicator Status	Stratum
1. *Ambrosia artemisifolia*	FACU	herb
2. *Ambrosia trifida*	FAC+	herb
3. *Elymus virginicus*	FACW-	herb
4. *Phalaris arundinacea*	FACW+	herb
5. *Lolium perenne*	FACU	herb

b) Presence of hydric soils

The NRCS mapped the poorly drained Sawmill silty clay loam and a wetter version of that series over the vast majority of the site. The somewhat poorly drained Lawson silt loam was mapped in the very northeast portion of the project area (Ray et al. 1976), but was not found during any of the field investigations. Soil borings were made in 2003 by the ISGS and a rough soils map was compiled in January of 2006 by INHS personnel (Plankell and Weaver-Miner 2007). The findings of the ISGS and INHS personnel from that 2007 report were consistent with each other. The soils map provided by INHS personnel in Plankell and Weaver-Miner (2007) shows the poorly drained Otter silt loam over a large portion of the site and the well drained Batavia silt loam on the western and southern portions of the site.

The break between hydric and non-hydric continues to remain largely the same as was reported in Plankell and Weaver-Miner (2007). In the northeast corner of the site is a well drained soil,

Dickinson sandy loam (Table 3). This sloping area has a low likelihood of becoming hydric. Batavia silt loam (Table 4) is well to moderately-well drained soil mapped on the western portion of the monitoring area. Batavia covers the largest extent of all the soil mapping units within the monitored areas. The likelihood of this soil becoming hydric is undetermined and would be largely dependant on the duration of wetland hydrology on the site. The minor amount of redox concentrations present in the soil surface horizon are the likely the result of long flooding events last year and will not continue to develop without wetland hydrology. Sawmill silty clay loam, a poorly drained soil, is mapped within and along the wet meadow drainageway running through the northeast corner and along the eastern side of the monitoring area. Thorpe silt loam (Table 5), a poorly drained soil, is mapped between the Sawmill and Batavia soils. This soil makes up the majority of the hydric soils within the monitored areas. The approximate extent of hydric soils within the monitored area can be found on Figure 1 in Appendix 2. The line demarking hydric from non-hydric soil on Figure 1 is approximated from field observations and has not been mapped on-site for accuracy at this time.

Table 3. Soil from the northeast corner of the tree planting area (Site 1) (Dickinson sandy loam)

Depth [cm]	Matrix Color	Redox Concentrations	Redox Depletions	Texture	Structure
0-25	10YR 2/2	-	-	sandy loam	granular
25-38	10YR 3/3	-	-	silt loam	very weak subangular blocky
38-56	10YR 3.5/4	-	-	silt loam	weak subangular blocky
56-91	10YR 4/6 & 10YR 3/3	-	-	sandy loam	weak subangular blocky

Table 4. Dominant non-hydric soil from both tree planting areas (Site 2) (Batavia silt loam)

Depth [cm]	Matrix Color	Redox Concentrations	Redox Depletions	Texture	Structure
0-20	10YR 2/1	10YR 4/6, less than <2%	-	silty clay loam	subangular blocky
20-76	10YR 4/3	-	10YR 4/2 in small root zones	clay loam to silty clay loam	subangular blocky
76-102	10YR 4/3 & 10YR 3/3	-	10YR 4/2 in small root zones	silty clay loam	subangular blocky

Table 5. Dominant hydric soil from both tree planting areas (Site 2) (Thorpe silt loam)

Depth [cm]	Matrix Color	Redox Concentrations	Redox Depletions	Texture	Structure
0-25	10YR 2/1	-	-	silty clay loam	subangular blocky
25–38	10YR 4/2	7.5YR 3/3	-	silty clay loam	subangular blocky
38-89	10YR 4/2	10YR 4/8	-	silty clay loam	subangular blocky
89-102	10YR 5/2	7.5YR 4/6 & 10B 5/0 soft	-	silty clay	subangular blocky

masses

c) Presence of wetland hydrology

The berm placed across the wooded drainageway immediately up-stream from the oxbow pond was holding water during the site visit on 11 August 2009 and likely contributed to increasing the period of wetland hydrology on site again this year.

Field evidence of wetland hydrology included low landscape position over portions of the site, drift and drift lines, wetland drainage patterns, and areas of saturated soils and shallow inundation in existing wetlands adjacent to the restoration areas and within restoration areas themselves.

Well data from instruments placed by ISGS personnel estimated that 3.0 ha (7.4 acres) of the site met the wetland hydrology criterion for 12.5% of the 2009 growing season, while 5.0 ha (12.5 acres) made hydrology for 5% of the 2009 growing season. An above normal amount of rain this year and flooding on the Pecatonica River in April contributed to the wetland hydrology of this site (Fucciolo et al. 2009). The ISGS estimates of areas that met the 5% and 12.5% benchmarks for wetland hydrology are shown on Figure 2 in Appendix 2.

Project Goal 2

a) Survival of planted trees

Table 6 presents data for planted tree survival, with numbers of observed live and apparent dead stems. Density of live stems of each species is also listed.

Table 6. Observed survival of planted trees in 2009

Species	Total stems Observed	(north field)	(south field)	Total density live/acre (live/ha)
Carya illinoensis	282	248	34	16.46 (40.63)
Fraxinus pennsylvanica	291	266	25	16.99 (41.93)
Platanus occidentalis	235	211	24	13.72 (33.86)
Quercus bicolor	250	228	22	14.60 (36.02)
Quercus palustris	301	280	21	17.57 (43.37)
Total live stems	1359	1233	126	79.33 (195.82)
Dead	225	200	25	

In the third year of observation, most of the planted trees seem to still be doing well. Survival exceeds the project goal of 55 established planted trees/acre. Wire cages on some of the saplings, particularly along the northern portion of the drainageway, are continuing to cause problems by either rubbing bark and causing wounds or becoming mangled, thereby thwarting resprouting efforts.

Seedlings and small shrub-sized individuals of native trees were also observed on the tree planting areas. These will continue to come in from surrounding woodlands and hasten the development of the planned wetland areas on the mitigation site as floodplain forest.

b) Native species composition and
c) Dominant plant species

Among the project goals for the mitigation site are that a majority of species on the site be native, non-weedy perennials, and that none of the dominant species be non-native or weedy species such as reed canary grass, cattail, or sandbar willow. Table 7 presents the total number of plant species, number of native species, perennial non-weedy native species (PNWN) and percent of PNWN species for each of the wetland determination sites within the wetland mitigation site.

Table 7. Percent perennial, non-weedy native species (PNWN)

Site #	Total species	Native	PNWN	% PNWN
1 non-native grassland	28	21	12	42.9
2 wet meadow	81	61	33	40.7

Again this year neither site 1 nor site 2 have met the goal of greater than 50% perennial, non-weedy native species. Percent PNWN for site 1 increased 16.4% over last year, but site 2 is down 1.3% from last year (Kurylo et al. 2008). The number of perennial, non-weedy native species would normally be expected to increase over time. Despite the decrease in percent PNWN for site 2 the number of total species, natives, and PNWN have all increased over the last year by 31, 18, and 12, respectively (Kurylo et al. 2008). Most of the dominant species continue to be either non-native or weedy native species.

The existing wet meadow drainage-way continues to have *Phalaris arundinacea* (reed canary grass) as a dominant. This non-native, aggressive perennial grass can spread quickly by seed and rhizomes under suitable conditions, and is very likely to invade the restoration area. This species was common before the mitigation site was established (Plankell and Weaver-Miner 2007). The project goal that more than 50% native, non-weedy species dominate the site is threatened by this species, as well as the goal that *Phalaris* not be a dominant on the site. Control with herbicides and/or well-timed mowings or burnings should be considered, being careful to avoid other, more desirable, vegetation.

Summary and Recommendations

Precipitation was abover average again this year, but only one major flood event occurred on the Pecatonica River. The berm across the wooded drainage-way up-stream from the oxbow pond appears to be retaining water on the site for longer periods, contributing to wetland hydrology.

Planted tree species continue to do well, exceeding project goals. Natural colonization by woody species from the surrounding wetlands will also continue to augment tree density. Effort should be made to remove the wire cages from the trees along the wet meadow drainage-way in the northeastern portion of the site. Many of the trees have severe bark rubbing or the cage is disfigured enough to impede the growth/resporouting of the trees. Additionally, all the *Juglans cinerea* that were planted in the northwest portion of the site appear to be dead.

From Figure 1, the area meeting all three wetland criteria can be discerned by locating the area of hydric soil. This area is approximately 2.7 ha (6.7 ac).

Phalaris arundinacea (reed canary grass) is a continued threat to project's goals for native species richness and dominance. It is common in areas surrounding the site and is the only dominant in the wet meadow drainageway running through the restoration site. *Phalaris* has become a dominant on site 1 and continues to creep out farther into site 2. Given the overall goal for this site is to create floodplain forest, the long term dominance of *Phalaris* may be diminished as the forest canopy closes and shades the site (Hovick and Reinartz 2007). To meet the 5-year project objectives, some effort to control the species should be made. *Phalaris arundinacea* is rhizomatous and has non-dormant seeds creating a ready-to-germinate seed bank (Apfelbaum and Sams 1987). The literature suggests that a one-time application of herbicide, burning, or mowing will only reduce the species biomass temporarily (Lavergne and Molofsky 2006, Wilcox et al. 2007). A common practice of land managers for *Phalaris* abatement is a spring burn followed by spring herbicide treatment, but this often achieves only short term effectiveness. A spring burn followed by a late August or late September application of glyphosate was found to be more effective, although still a short term solution (Adams and Galatowitsch 2006). Rodeo®, a formulation of glyphosate recommended for wetlands, has been found to be effective in a handful of studies, but again, only in the short term (Lavergne and Molofsky 2006).

For long term control, efforts spread out over the year and over multiple years are found to be more effective. An Iowa study found reduced coverage of *Phalaris* in open areas of an oak savannah after 2-4 burns over 7 years (Dettman and Mabry 2008). An Illinois Nature Preserve was able to push back and keep *Phalaris* at it margins with burns every 2-3 years (Apfelbaum and Rouffa 1983). According to Lavergne and Molofsky (2006), the most effective methods combine both chemical and physical practices for the long term control of *Phalaris*. A suggestion for the areas of this site where *Phalaris* is a problem, namely the existing wet meadow drainageway and the northwest corner of the site, may include a spring application of Rodeo® followed by mowing in the early fall of the same year, hydrology permitting. In the second year conservatively apply Rodeo® in the fall and follow in the third year with a spring burn. Burning would be of concern where the planted trees are densely surrounded by *Phalaris* as the trees may not be old enough, or bark thick enough, to withstand a low intensity fire. By applying herbicide and mowing in the first few years before burning, the amount of fuel and area needing to be burned should hopefully be reduced.

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Appendix 1

Wetland Determination Forms

ROUTINE ONSITE WETLAND DETERMINATION
Site 1 (page 1 of 3)

Field Investigators: Kurylo, Matthews, Zylka, and Wilm **Date**: 11 August 2009
Job No.: P92-029-02 **Project Name**: FAP 301 (US 20-Freeport bypass)
State: Illinois **County**: Stephenson **Applicant**: IDOT District 2
Site name: non-native grassland
Legal Description: SW/4, SW/4, SW/4, Sec. 14, T.27N., R.7E.
Location: Former crop field in the northeast corner of the mitigation site.

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

VEGETATION

Dominant Plant Species	**Indicator Status**	**Stratum**
1. *Bidens frondosa*	FACW	herb
2. *Phalaris arundinacea*	FACW+	herb
3. *Setaria faberi*	FACU+	herb

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

Hydrophytic vegetation? Yes: X No:
Rationale: Greater than 50% of the dominants are OBL, FACW, or FAC.

SOILS
Series and phase: NRCS mapped as Lawson silt loam, revised to Dickinson sandy loam
On Stephenson County hydric soils list? Yes: No: X
Is the soil a histosol? Yes: No: X
Histic epipedon present? Yes: No: X
Redox concentrations? Yes: No: X Color: N/A
Redox depletions? Yes: No: X Color: N/A
Matrix color: 10YR 2/2 over 10YR 3/3
Other indicators: The site is situated on a slope above the rest of the project area.

Hydric soils: Yes: No: X
Rationale: The Natural Resources Conservation Service classifies Dickinson as having well drained conditions. This soil has a subsurface matrix color too bright to be considered hydric and the soil lacks any redoximorphic features.

ROUTINE ONSITE WETLAND DETERMINATION
Site 1 (page 2 of 3)

Field Investigators: Kurylo, Matthews, Zylka, and Wilm **Date**: 11 August 2009
Job No.: P92-029-02 **Project Name**: FAP 301 (US 20-Freeport bypass)
State: Illinois **County**: Stephenson **Applicant**: IDOT District 2
Site name: non-native grassland
Legal Description: SW/4, SW/4, SW/4, Sec. 14, T.27N., R.7E.
Location: Former crop field in the northeast corner of the mitigation site.

HYDROLOGY

Inundated: Yes: No: X Depth of standing water: None
Depth to saturated soil: More than 0.9 m (36 in)
Overview of hydrologic flow through system: Precipitation, sheet flow, and rare overflow from the Pecatonica River contribute water to this site. Water leaves the site by evapotranspiration, soil infiltration, and sheet flow to Site 2 and the drainageway running through the restoration site.
Size of watershed: About 3367 km^2 (1300 mi^2)
Other field evidence observed: This site is located on a slope at the edge of a floodplain.

Wetland hydrology: Yes: No: X
Rationale: This site is on a slope and at an elevation that appears to rarely flood in normal years. The ISGS did not find this site to have wetland hydrology for even 5% of the 2009 growing season (Fucciolo et al. 2009).

WETLAND DETERMINATION AND RATIONALE

Is the site a wetland? Yes: No: X
Rationale: This site is not likely to become a wetland despite possessing hydrophytic vegetation during this past growing season.

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ROUTINE ONSITE WETLAND DETERMINATION
Site 1 (page 3 of 3)

Field Investigators: Kurylo, Matthews, Zylka, and Wilm **Date**: 11 August 2009
Job No.: P92-029-02 **Project Name**: FAP 301 (US 20-Freeport bypass)
State: Illinois **County**: Stephenson **Applicant**: IDOT District 2
Site name: non-native grassland
Legal Description: SW/4, SW/4, SW/4, Sec. 14, T.27N., R.7E.
Location: Former crop field in the northeast corner of the mitigation site.

SPECIES LIST

Scientific Name	Common Name	Stratum	Wetland indicator status	C**
Acer saccharinum	silver maple	herb	FACW	1
Asclepias incarnata	swamp milkweed	herb	OBL	4
Aster ontarionis	Ontario aster	herb	FAC	4
Bidens comosa	beggar's ticks	herb	OBL	2
Bidens frondosa	common beggar's ticks	herb	FACW	1
Boltonia asteroides	false aster	herb	FACW	5
†*Carya illinoensis*	pecan	shrub	FACW	6
Cirsium vulgare	bull thistle	herb	FACU-	*
Conyza canadensis	horseweed	herb	FAC-	0
Echinochloa muricata	barnyard grass	herb	OBL	0
Erigeron annuus	annual fleabane	herb	FAC-	1
†*Fraxinus pennsylvanica*	green ash	shrub	FACW	2
Lycopus americanus	common water horehound	herb	OBL	3
Melilotus officinalis	yellow sweet clover	herb	FACU	*
Persicaria amphibium	water smartweed	herb	OBL	3
Persicaria pensylvanica	giant smartweed	herb	FACW+	1
Persicaria punctata	dotted smartweed	herb	OBL	3
Phalaris arundinacea	reed canary grass	herb	FACW+	*
†*Platanus occidentalis*	sycamore	shrub	FACW	3
Potentilla norvegica	rough cinquefoil	herb	FAC	0
†*Quercus bicolor*	swamp white oak	shrub	FACW+	7
†*Quercus palustris*	pin oak	shrub	FACW	4
Rumex crispus	curly dock	herb	FAC+	*
Scutellaria lateriflora	mad-dog skullcap	herb	OBL	4
Setaria faberi	giant foxtail	herb	FACU+	*
Solanum carolinense	horse nettle	herb	FACU-	0
Sonchus asper	prickly sowthistle	herb	FAC	*
Trifolium hybridum	alsike clover	herb	FAC-	*

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

With planted species:
mCv = ∑C/N = 54/21 = 2.6
FQI = ∑C/√N = 54/√21 = 11.8
Without planted species:
mCv = ∑C/N = 32/16 = 2.0
FQI = ∑C/√N = 32/√16 = 8.0

ROUTINE ONSITE WETLAND DETERMINATION
Site 2 (page 1 of 5)

Field Investigators: Kurylo, Matthews, Zylka, and Wilm **Date**: 11 August 2009
Job No.: P92-029-02 **Project Name**: FAP 301 (US 20-Freeport bypass)
State: Illinois **County**: Stephenson **Applicant**: IDOT District 2
Site name: wet meadow
Legal Description: SW/4, SW/4, SW/4, Sec. 14, T.27N., R.7E.
Location: The majority of the former crop fields away from the drainage-way running along the east side of the mitigation site.

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

VEGETATION

Dominant Plant Species	**Indicator Status**	**Stratum**
1. *Ambrosia artemisifolia*	FACU	herb
2. *Ambrosia trifida*	FAC+	herb
3. *Elymus virginicus*	FACW-	herb
4. *Phalaris arundinacea*	FACW+	herb
5. *Lolium perenne*	FACU	herb

Percentage of dominant species that are OBL, FACW, or FAC: 60%

Hydrophytic vegetation? Yes: X No:
Rationale: Greater than 50% of the dominants are OBL, FACW, or FAC.

SOILS (see Figure 1 in Appendix 2 for approximate extents)
Series and phase: Thorpe silt loam (eastern part of site) and Batavia silt loam (western part of site)
On Stephenson County hydric soils list? Yes: X (Thorpe) No: X (Batavia)
Is the soil a histosol? Yes: No: X
Histic epipedon present? Yes: No: X
Redox concentrations? Yes: X No: (Thorpe)
Redox depletions? Yes: No: X
Matrix color: 10YR 2/1 over 10YR 4/2 (Thorpe) and 10YR 3/1 over 10YR 4/3 (Batavia)
Other indicators: Soft masses in the subsurface horizons were found in the Thorpe soils.
Hydric soils: Yes: No: Undetermined: X
Rationale: The Natural Resources Conservation Service classifies Thorpe as having poorly drained conditions and Batavia as a well to moderately well drained soil. Thorpe soils have a low chroma over depleted matrix with prominent redox concentrations. These characteristics are evidence of a hydric soil and they meet the A11 hydric soil indicator from the NRCS. Batavia is not a hydric soil.

ROUTINE ONSITE WETLAND DETERMINATION
Site 2 (page 2 of 5)

Field Investigators: Kurylo, Matthews, Zylka, and Wilm **Date**: 11 August 2009
Job No.: P92-029-02 **Project Name**: FAP 301 (US 20-Freeport bypass)
State: Illinois **County**: Stephenson **Applicant**: IDOT District 2
Site name: wet meadow
Legal Description: SW/4, SW/4, SW/4, Sec. 14, T.27N., R.7E.
Location: The majority of the former crop fields away from the drainageway running along the east side of the mitigation site.

HYDROLOGY

Inundated: Yes: X (parts near wet meadow drainage) No: Depth of standing water: less than 0.3 m (1 ft)
Depth to saturated soil: At surface to below 0.6 m (24 in)
Overview of hydrologic flow through system: Precipitation, sheet flow, and overflow from the Pecatonica River and drainageway running through the compensation site contribute water to this site. Water leaves the site by evapotranspiration, soil infiltration, and sheetflow to the aforementioned and adjacent oxbow along the western edge of the site.
Size of watershed: About 3367 km^2 (1300 mi^2)
Other field evidence observed: This site is within a floodplain. Saturated areas are present on the site adjacent to the drainageway. Drift and surface water were observed.

Wetland hydrology: Yes: No: Undetermined: X
Rationale: ISGS calculations suggest that only lower areas of the site along the wet meadow drainageway met wetland hydrology 12.5% of the growing season, with scant additional areas beyond that making wetland hydrology 5% of the growing season (Figure 2) (Fucciolo et al. 2009).

WETLAND DETERMINATION AND RATIONALE

Is the site a wetland? Yes: No: Undetermined: X
Rationale: Despite dominant hydrophytic vegetation over the site as a whole, wetland hydrology and hydric soils do not exist over the whole site.

Determined by: Jesse Kurylo (soils and hydrology)
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1816 South Oak Street
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ROUTINE ONSITE WETLAND DETERMINATION
Site 2 (page 3 of 5)

Field Investigators: Kurylo, Matthews, Zylka, and Wilm **Date**: 11 August 2009
Job No.: P92-029-02 **Project Name**: FAP 301 (US 20-Freeport bypass)
State: Illinois **County**: Stephenson **Applicant**: IDOT District 2
Site name: wet meadow
Legal Description: SW/4, SW/4, SW/4, Sec. 14, T.27N., R.7E.
Location: The majority of the former crop fields away from the drainageway running along the east side of the mitigation site.

SPECIES LIST

Scientific Name	Common Name	Stratum	Wetland indicator status	C**
Abutilon theophrasti	velvet-leaf	herb	FACU-	*
Acalypha rhomboidea	three-seeded mercury	herb	FACU	0
Acer saccharinum	silver maple	herb	FACW	1
Agropyron repens	quack grass	herb	FACU	*
Agrostis alba	red top	herb	FACW	0
Alisma plantago-aquatica	broad-leaf water-plantain	herb	OBL	2
Amaranthus tuberculatus	tall waterhemp	herb	OBL	1
Ambrosia artemisiifolia	common ragweed	herb	FACU	0
Ambrosia trifida	giant ragweed	herb	FAC+	0
Ammannia coccinea	long-leaved ammannia	herb	OBL	5
Apocynum cannabinum	dogbane	herb	FAC	2
Asclepias incarnata	swamp milkweed	herb	OBL	4
Aster ontarionis	Ontario aster	herb	FAC	4
Aster pilosus	hairy aster	herb	FACU+	0
Bidens frondosa	common beggar's ticks	herb	FACW	1
Boehmeria cylindrica	false nettle	herb	OBL	3
Boltonia asteroides	false aster	herb	FACW	5
Bromus japonicus	Japanese brome	herb	FACU	*
Campanulastrum americanum	American bellflower	herb	FAC	4
Carex grayi	bur sedge	herb	FACW+	6
†*Carya illinoensis*	pecan	shrub	FACW	6
Chamaesyce supina	milk spurge	herb	UPL	0
Chenopodium album	lamb's quarters	herb	FAC-	*
Cichorium intybus	chickory	herb	UPL	*
Cirsium vulgare	bull thistle	herb	FACU-	*
Conyza canadensis	horseweed	herb	FAC-	0
Cyperus esculentus	yellow nut-sedge	herb	FACW	0
Daucus carota	Queen Anne's lace	herb	UPL	*
Echinochloa muricata	barnyard grass	herb	OBL	0
Eleocharis obtusa	blunt spike rush	herb	OBL	2
Elymus canadensis	Canada wild rye	herb	FAC-	4
Elymus virginicus	Virginia wild rye	herb	FACW-	4
Epilobium coloratum	cinnamon willow herb	herb	OBL	3

Species list continues on next page…..

ROUTINE ONSITE WETLAND DETERMINATION
Site 2 (page 4 of 5)

Field Investigators: Kurylo, Matthews, Zylka, and Wilm **Date**: 11 August 2009
Job No.: P92-029-02 **Project Name**: FAP 301 (US 20-Freeport bypass)
State: Illinois **County**: Stephenson **Applicant**: IDOT District 2
Site name: wet meadow
Legal Description: SW/4, SW/4, SW/4, Sec. 14, T.27N., R.7E.
Location: The majority of the former crop fields away from the drainageway running along the east side of the mitigation site.

SPECIES LIST

Scientific Name	Common Name	Stratum	Wetland indicator status	C**
Erechtites hieracifolia	fire weed	herb	FACU	2
Erigeron annuus	annual fleabane	herb	FAC-	1
†*Fraxinus pennsylvanica*	green ash	shrub	FACW	2
Gleditsia triacanthos	honey locust	herb	FAC	2
Hordeum jubatum	squirrel-tail	herb	FAC+	*
Lactuca serriola	prickly lettuce	herb	FAC	*
Laportea canadensis	wood nettle	herb	FACW	2
Leersia oryzoides	rice cutgrass	herb	OBL	3
Lolium perenne	crested rye grass	herb	FACU	*
Lycopus americanus	common water horehound	herb	OBL	3
Lycopus virginicus	bugle weed	herb	OBL	5
Melilotus officinalis	yellow sweet clover	herb	FACU	*
Mentha arvensis villosa	field mint	herb	FACW	4
Mimulus ringens	monkey flower	herb	OBL	5
Morus alba	white mulberry	shrub	FAC	*
Penthorum sedoides	ditch stonecrop	herb	OBL	2
Persicaria amphibium	water smartweed	herb	OBL	3
Persicaria hydropiper	common smartweed	herb	OBL	*
Persicaria pensylvanica	giant smartweed	herb	FACW+	1
Persicaria punctata	dotted smartweed	herb	OBL	3
Phalaris arundinacea	reed canary grass	herb	FACW+	*
Phleum pratense	Timothy	herb	FACU	*
Physostegia virginiana	false dragonhead	herb	FACW	6
Pilea pumila	Canada clearweed	herb	FACW	3
Plantago rugelii	red-stalked plantain	herb	FAC	0
†*Platanus occidentalis*	sycamore	shrub	FACW	3
Populus deltoides	eastern cottonwood	herb	FAC+	2
Potentilla norvegica	rough cinquefoil	herb	FAC	0
†*Quercus bicolor*	swamp white oak	shrub	FACW+	7
†*Quercus palustris*	pin oak	shrub	FACW	4
Rorippa palustris	marsh yellow cress	herb	OBL	4
Rudbeckia laciniata	cutleaf coneflower	herb	FACW+	3
Rumex crispus	curly dock	herb	FAC+	*

Species list continues on next page…..

ROUTINE ONSITE WETLAND DETERMINATION
Site 2 (page 5 of 5)

Field Investigators: Kurylo, Matthews, Zylka, and Wilm **Date**: 11 August 2009
Job No.: P92-029-02 **Project Name**: FAP 301 (US 20-Freeport bypass)
State: Illinois **County**: Stephenson **Applicant**: IDOT District 2
Site name: wet meadow
Legal Description: SW/4, SW/4, SW/4, Sec. 14, T.27N., R.7E.
Location: The majority of the former crop fields away from the drainageway running along the east side of the mitigation site.

SPECIES LIST

Scientific Name	Common Name	Stratum	Wetland indicator status	C**
Sagittaria latifolia	arrowhead	herb	OBL	4
Salix exigua	sandbar willow	shrub, herb	OBL	1
Scutellaria lateriflora	mad-dog skullcap	herb	OBL	4
Setaria faberi	giant foxtail	herb	FACU+	*
Sium suave	water parsnip	herb	OBL	5
Solanum carolinense	horse nettle	herb	FACU-	0
Sparganium eurycarpum	burreed	herb	OBL	5
Taraxacum officinale	common dandelion	herb	FACU	*
Teucrium canadense	American germander	herb	FACW-	3
Thlaspi arvense	field penny cress	herb	UPL	*
Toxicodendron radicans	poison ivy	shrub	FAC+	1
Trifolium hybridum	alsike clover	herb	FAC-	*
Verbena urticifolia	white vervain	herb	FAC+	3
Veronica peregrina	purslane speedwell	herb	FACW+	0
Vitis riparia	riverbank grape	vine	FACW-	2

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

With planted species:
mCv = ∑C/N = 155/61 = 2.5
FQI = ∑C/√N = 155/√61 = 19.8
Without planted species:
mCv = ∑C/N = 133/56 = 2.4
FQI = ∑C/√N = 133/√56 = 17.8

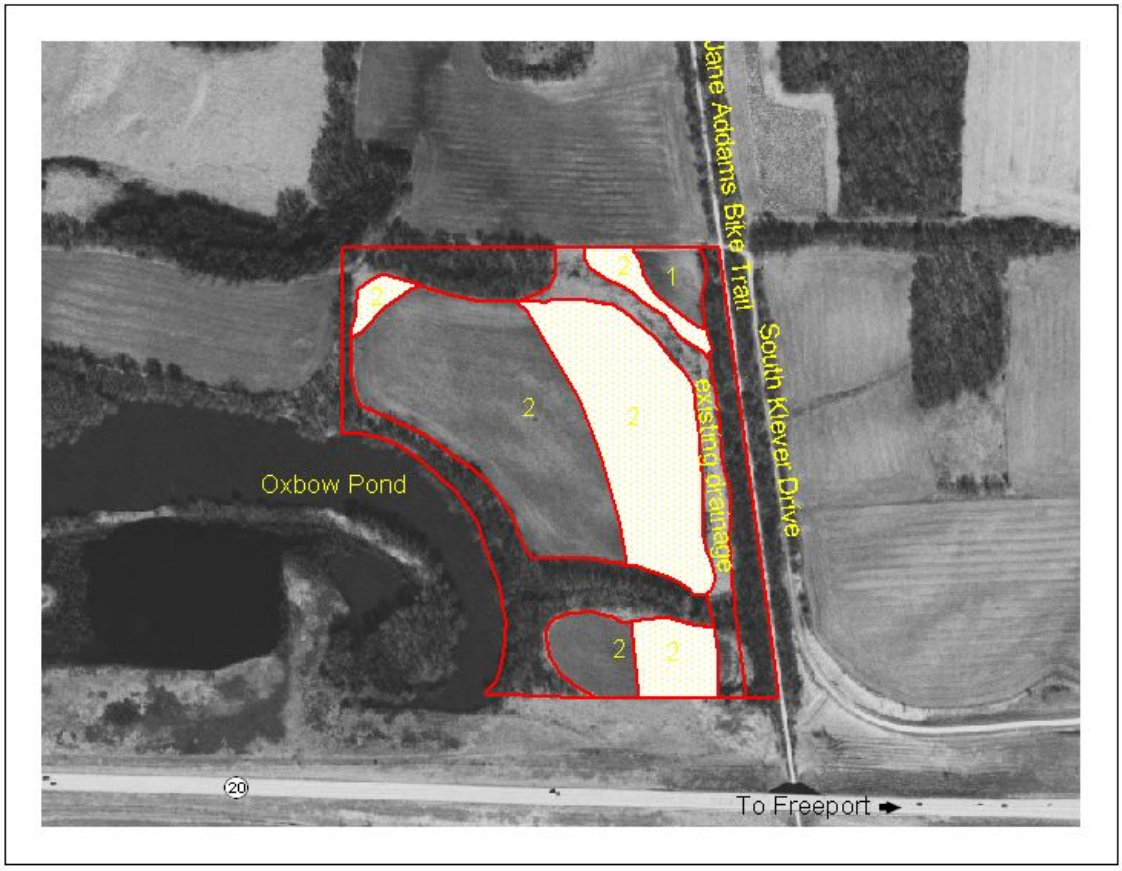
Appendix 2

Figures and Maps

Figure 1

Wetland Compensation Site Map

Jane Addams Bike Trail
Wetland Mitigation Site
Stephenson County - 2009



0 400 800 Feet

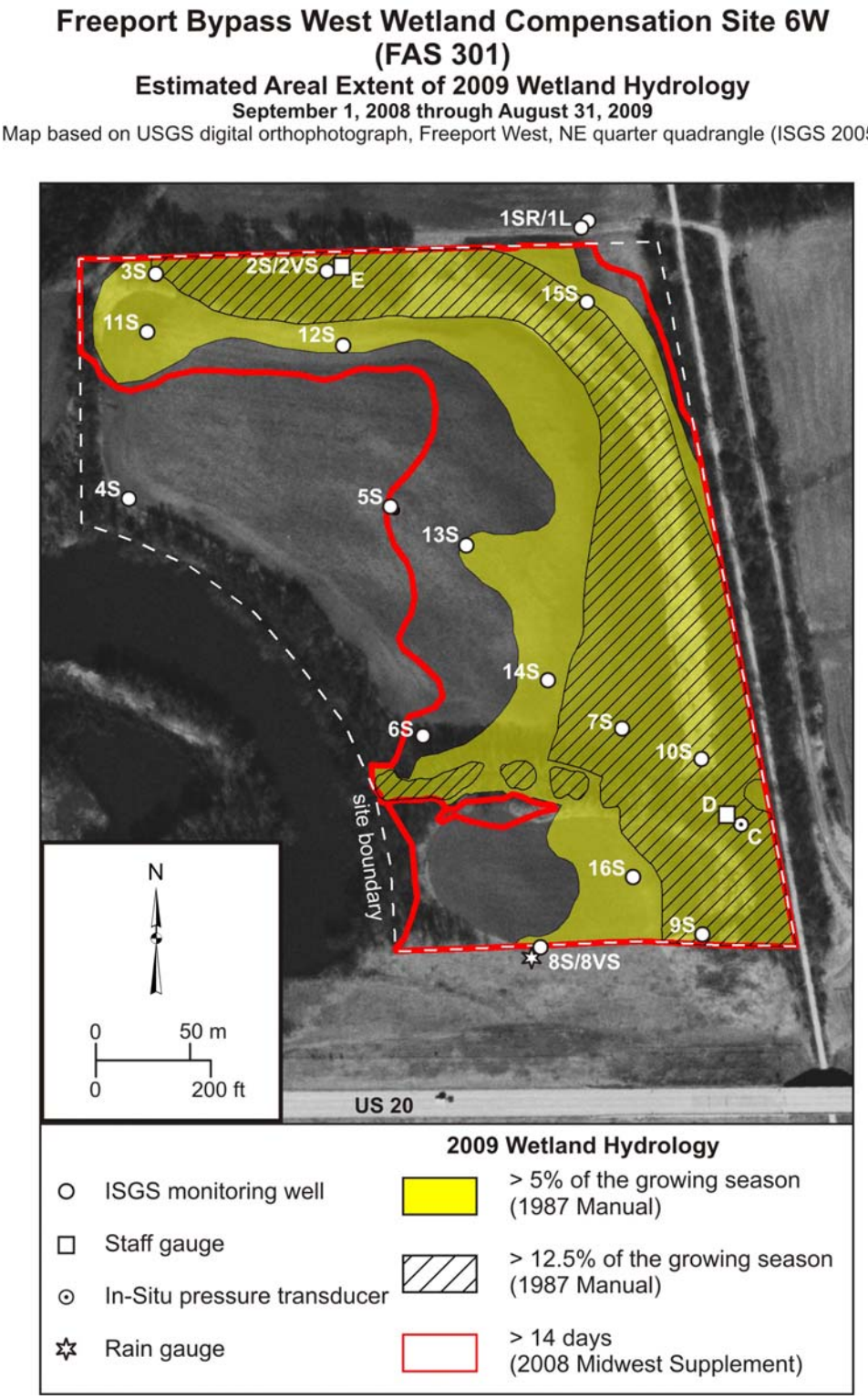
0 100 200 Meters

scale 1:4800
1 inch=400 ft

Hydric soil
Project boundary and wetland sites

01/10

Figure 2
ISGS Wetland Hydrology Map



Fucciolo et al. 2009

Appendix 3
Photos

Photo Station 1 – South field, northeast corner looking southwest.

Photo Station 2 – South field, southwest corner looking northeast.

Photo Station 3 – North field, southwest corner looking northeast.

Photo Station 4 – North field, northwest corner looking southeast.

Photo Station 5 – North field, northeast corner looking southwest.

Photo Station 6 – North field, southeast corner looking northwest.