

Wetland Mitigation Monitoring for FAP 312 /IL 3 (Sugar Camp Creek) - 2009

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Introduction

Road construction along IL 3 will result in impacts to 1.41 ha (3.49 acres) of wetland, including a site with Floristic Quality > 20.0 and harboring the State Threatened rice rat (*Oryzomys palustris*). A compensation plan was prepared which called for floodplain forest and emergent wetland restoration at a ratio of 5.5:1 (7.77 ha (19.19 acres)) at a site along Sugar Camp Creek near Benton, IL in Franklin Co. (Legal location: T 5 S, R 4 E, Sect. 32, SE/4 SE/4). Sugar Camp Creek enters the Middle Fork of the Big Muddy River 0.91 km (0.57 mi) south of the property. Over 405 ha (1000 ac) of floodplain forest, including one contiguous 600 acre block along the Middle Fork, occur within 7.25 km (4.5 mi) of the tract. The site consisted of a wet, fallow agricultural field surrounding a straightened and ditched section of the creek. Hydrologic alterations involve blocking a scratch ditch, which drains an abandoned oxbow in the field. This temporary berm has now been breached. The compensation plan calls for restoration of 16.5 acres of floodplain forest and 2.6 acres of emergent wetland (the oxbow). The forest restoration involves the planting of bare root seedlings of nine species at a rate of 562 per acre. The understory is to be seeded with red top (*Agrostis alba*). The emergent restoration is to revegetate naturally. The site is to be monitored annually for the potential presence of *Oryzomys palustris* (rice rat). The wetland restoration site was mostly completed in spring 2005 (Taft et al. 1997, IDOT 2005). An additional 4.0 acres was planted in spring 2006 (IDOT, pers. comm.).

In 2009, field monitoring was conducted on 16 and 17 July, and mammal surveys on 19, 20 and 21 October. This report details results of the 2009 monitoring. Project goals, objectives and performance criteria are included, as are monitoring methods, monitoring results, summary information and recommendations. This project has no monitoring plan.

Project Goals, Objectives and Performance Criteria

Proposed goals and objectives are based on information contained in the original IDOT project request (Sunderland 2005) and the project wetland compensation plan (IDOT 2005). 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 five year monitoring period. Project goals, objectives and performance criteria are listed below.

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

Objective: The wetland restoration should compensate for the loss of 3.49 acres of forested wetland, swamp, marsh and scrub-shrub wetland at a replacement ratio of 5.5:1, for a total requirement of 19.19 acres.

Performance Criteria: The entire wetland restoration 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 site 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 wetland restoration should meet minimum standards as to planted tree survival and floristic composition.

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

Performance Criteria: At the end of the five year monitoring period $\geq 80\%$ of the planted trees should be alive (450 out of 562 per acre). At least 50% of the plant species present should be native and non-weedy. None of the three most dominant species in any stratum may be nonnative or weedy.

Methods

Monitoring will be performed on the wetland restoration site. INHS personnel began monitoring the area in 2005 and will continue yearly monitoring through 2009 (five years). The Illinois State Geological Survey (ISGS) has been tasked to monitor hydrology. Monitoring reports on the status of the 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 five year monitoring period, written management recommendations will be submitted to IDOT in an effort to correct the problems.

Project Goal 1

A. Hydrophytic Vegetation - Using visual estimation, the dominant species of vegetation in each community are determined. Dominance is based on Importance Value, a numerical average of species' relative frequency, density and aerial coverage (or basal area) (Cox 1985). In each stratum dominant species include, starting with the most abundant, those species whose Importance Values, when summed in descending order, immediately 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 - Soil cores collected from the mitigation site are examined for the presence of redoximorphic features (Environmental Laboratory 1987). Hydrologic alteration at this site is minimal, consisting of blocking a scratch ditch draining the oxbow area. Therefore, soil conditions are not expected to change greatly over time.

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 (Pociask 2009). 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.ercd.usace.army.mil/wetlands/pdfs/wlman87.pdf>]). Inundation and saturation at the site were monitored using a combination of 9 monitoring wells and 1 stage gauge. 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 measured surface-water and shallow ground-water levels at regular intervals to document all hydrologic events. 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, 2008 to September 1, 2009 (Pociask 2009).

Information provided by the ISGS concerning hydrology of the site is included in 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

A. Woody vegetation - Within the forest restoration site, quantitative sampling of planted tree species is conducted. Starting 152 m (500 ft) in from the northeast corner of the site, and proceeding north to south then south to north on consecutive planted rows, the first 30 m (99 ft) in each 302 m (990 ft) section of row is sampled (10.6 ft X 99 ft (0.0241 acre) plot). This procedure results in a 10% sample (n = 56). Within each sampled section (or plot) live trees are tallied by species. A minimum of 450 live, planted trees/acre (80% of 562/acre) must be present

after five years. Importance Values of planted species are calculated as an average of relative frequency and relative density. The tree planting areas are mapped using Trimble GPS (global positioning system) and overlaid on digital ortho quad imagery using Arcview 3.2.

B. Herbaceous vegetation - Dominant herbaceous species within the wetland compensation site will be determined annually by visual estimation in an attempt to ensure that none of the three most dominant species are nonnative or weedy* through the fifth year of monitoring. A species list will be prepared annually and a Floristic Quality Index computed for the site in order to determine whether at least 50% of the plant species present are native and non-weedy* (Taft et al. 1997).

* For our purposes here, certain native, early successional species (C=1) that commonly occur in healthy wetlands and do not tend to overwhelm plant communities are not considered weedy: *Acer saccharinum*, *Bidens frondosa*, *Polygonum pennsylvanicum*, *Cyperus ferruginescens*, etc.

Faunal Surveys (Mammals)

In addition to the stated performance criteria, INHS personnel will conduct annual surveys of small mammals, in order to determine presence and abundance of *Oryzomys palustris* (rice rat).

Live trapping was conducted at the Sugar Camp Creek mitigation site on the nights of 19, 20, and 21 October by Jean Mengelkoch, Steve Amundsen, and Joe Merritt of the INHS. Folding, aluminum Sherman traps measuring 8 x 9 x 23 cm were used (H.B. Sherman Traps, Inc., Tallahassee, FL). The traps were baited with a mixture of rolled oats and peanut butter. The traps were placed on the ground at intervals of approximately 10 m. They were set during the late afternoon and checked the following morning (beginning at 0800 h).

The species, sex, and reproductive condition of captured animals were recorded. The position of the testes (either abdominal or scrotal) was used as a general indicator of the reproductive condition of male rodents. Females were examined for pregnancy (by gentle palpation of the abdomen) or lactation (by examination of the teats). Animals were suspended from a Pesola scale and weighed to the nearest 0.5 g. To determine the number of individuals of each species captured at the site, every animal trapped for the first time on the first or second morning of the trapping session was marked temporarily by clipping a small patch of fur on its rump. This made it possible to distinguish individuals that were re-captured from those that were being caught for the first time. After examination animals were released near the trap location.

The water in Sugar Camp Creek was about halfway up the banks and there was some standing water in the channel that flows from Sugar Camp Creek into the south end of the mitigation site. The low areas of the mitigation site were saturated, but most did not contain pools of water. A line of 56 traps was placed along the bank of Sugar Camp Creek. This trap line (A) ran most of the length of the area that has been released from cultivation. Three transects crossed the compensation site in areas where standing water had been present in 2006 and flooded in 2008. Two lines of traps were established across the southern portion of the site that flooded in 2008. The southernmost transect (B) had 9 traps and the other transect (C) had 22 traps. One line of traps (D – 18 traps) was established in the northern portion of the site where there had been a Y-shaped channel of water in 2006.

The sky was clear and there was no precipitation on any nights trapping occurred. The low temperature was 39.3°F (4.1°C) on 19 October, 46.2°F (7.9°C) on 20 October, and 41.8°F (5.4°C) on 21 October.

Results

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

In 2009, precipitation was 114% of normal. Conditions were wetter than normal in October, April, May and July. There were 13 small floods during the growing season. Almost the entire site conclusively displayed wetland hydrology – 7.7 ha (19 acres) (figure 1) (Pociask 2009). The emergent area is dominated by *Echinochloa muricata* (OBL), *Leersia oryzoides* (OBL) and *Xanthium strumarium* (FAC), and the forest restoration area is dominated by *Solidago canadensis* (FACU), *Eupatorium serotinum* (FAC+), *Agrostis alba* (FACW), *Panicum virgatum* (FAC+) and *Aster simplex* (FACW). Therefore, both of these areas have hydrophytic vegetation. The total tree planting area is 6.215 ha (15.35 acres). Of this, 1.478 ha (3.65 acres) is underlain by non-hydric Belknap silt loam. The remaining 4.737 ha (11.7 acres) of forest restoration plus the 1.437 ha (3.55 acres) of emergent wetland are underlain by hydric Bonnie silt loam. Therefore, in 2009, out of 7.65 ha (18.9 acres) of mitigation area, 6.215 ha (15.25 acres) have hydrophytic vegetation, hydric soils and wetland hydrology (figure 2, Appendix 1).

Project goal 2: The wetland restoration should meet minimum standards as to planted tree survival and floristic composition.

- A. Woody vegetation – At this site, nine species were listed for planting – *Betula nigra*, *Quercus palustris*, *Carya illinoensis*, *Q. bicolor*, *Platanus occidentalis*, *Fraxinus pennsylvanica*, *Q. shumardii*, *Taxodium distichum* and the shrub, *Cornus stolonifera*. The rate of stocking was specified as 562 stems/acre for 16.5 acres. All listed species were located except *Cornus stolonifera*. The listed, seeded ground cover, *Agrostis alba*, is a dominant understory species at the site. In 2009, in the 10.75 acre first planting, 502.9 trees/acre are present, predominantly *Betula nigra*, *Quercus palustris* and *Carya illinoensis*. Together with an additional 0.55 acre with 119 *Betula nigra*, survival is 87% on 11.3 acres. In the 4.0 acre second planting, 298.3 trees/acre are present, predominantly *Fraxinus* and *Platanus occidentalis*. In this area, survival is 53.1%. Within the emergent wetland restoration, a census revealed that 298 planted trees were present - *Taxodium distichum* (228) and *Betula nigra* (70). Scattered natural regeneration of ten native tree species (*Acer rubrum*, *Acer negundo*, *Acer saccharinum*, *Celtis occidentalis*, *Fraxinus pennsylvanica*, *Liquidambar styraciflua*, *Platanus occidentalis*, *Populus deltoides*, *Salix nigra* and *Ulmus americana*) was also observed. In 2009, the aerial extent of forest restoration falls short of the stated objective of 16.5 acres. The density of living planted trees is less than 450/acre (80% of the proposed 562/acre) in the 4 acre second planting (Table 1, 2, 3, Appendix 1).
- B. Herbaceous vegetation – Five years out of agriculture, the quality of vegetation continues to improve, but is still early successional in nature. Three of the dominant species in the forest

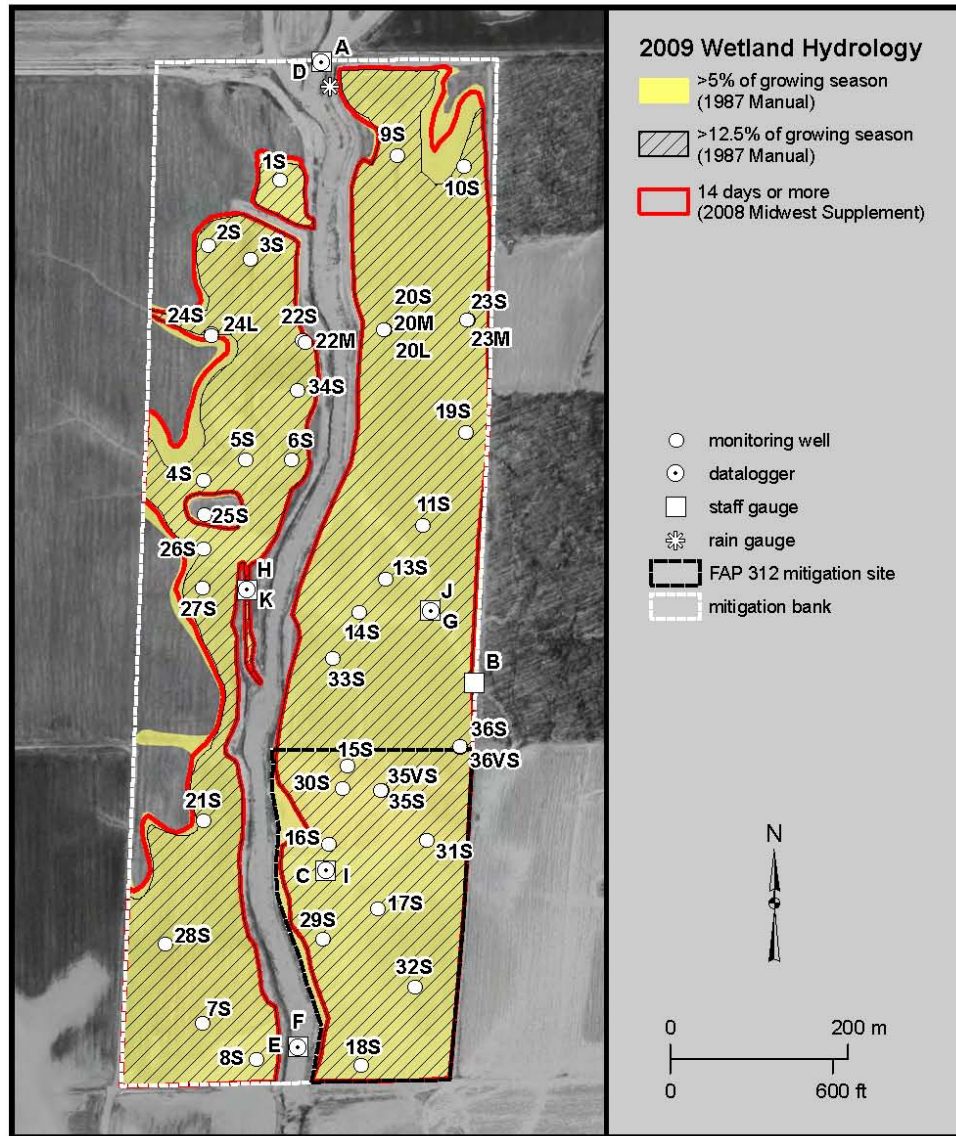
restoration (*Agrostis alba*, *Eupatorium serotinum*, and *Solidago canadensis*), and two of the dominant species in the emergent wetland (*Echinochloa muricata* and *Xanthium strumarium*,) are weedy native species unchanged from the previous two years. However, the fourth and fifth dominant species in the forest restoration are now *Panicum virgatum* and *Aster simplex*, both nonweedy species, and the nonweedy *Leersia oryzoides* is now a dominant in the emergent wetland. In the forest restoration, the number of plant species increased from 114 to 116 and FQI increased from 28.5 to 30.8. Percent native species decreased from 88.6% to 87.9% and percent nonnative or weedy decreased from 32% to 30%. In the emergent wetland number of species decreased from 57 to 49. FQI remained about the same (19.0 vs. 18.8). Percent native species increased from 87.7% to 91.8%. Percent nonnative or weedy decreased from 35.1 to 26.5%. The number of conservative species ($C \geq 6$) colonizing the site has increased from six to eight (*Pluchea camphorata* C=7, *Lobelia cardinalis* C=6, *Mimulus alatus* C=6, *Panicum rigidulum* C=6, *Carex grayi* C=6, *Liquidambar styraciflua* C=6, *Oenothera pilosella* C=6, *Galium tinctorium* C=6). In 2009, the percentage of nonnative or weedy native species remains well less than 50% at both forested and emergent restoration sites. Therefore, this stated objective is met. However, neither site yet meets the requirement that none of the three most dominant species may be nonnative or weedy (Appendix 1).

**Sugar Camp Creek Wetland Compensation Site
(FAP 312 and Proposed Wetland Mitigation Bank)**

Estimated Areal Extent of 2009 Wetland Hydrology

September 1, 2008 through August 31, 2009

Map based on USGS digital orthophotograph, Ewing SE quarter quadrangle,
aerial photography from April 1998 (ISGS 2000)



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figure 1. Aerial extent of measured wetland hydrology – 2009

Table 1. Planted Tree Species – east section. stems/acre, Importance Value (IV), percent survival, n=42

	stems/acre	I.V.	percent of 562/ac
<i>Betula nigra</i>	118.67	20.13	
<i>Quercus palustris/shumardi</i>	110.79	19.95	
<i>Carya illinoensis</i>	98.76	19.94	
<i>Quercus bicolor</i>	75.10	15.80	
<i>Fraxinus pennsylvanica</i>	62.24	15.72	
<i>Platanus occidentalis</i>	37.34	8.47	
Total (on 10.75 acres)	502.90	100.01	89.48%
Total (plus 119 <i>Betula</i> on addit. 0.55 acre)	488.95		87.00%

Table 2. Planted Tree Species – west section. stems/acre, Importance Value (IV), percent survival, n=16

	stems/acre	I.V.	percent of 562/ac
<i>Fraxinus pennsylvanica</i>	153.11	49.34	
<i>Platanus occidentalis</i>	101.25	38.03	
<i>Quercus bicolor</i>	36.10	8.68	
<i>Carya illinoensis</i>	7.88	3.95	
Total (on 4.0 acres)	298.34	100.00	53.08%

Table 3. Planted Tree Species – emergent wetland.

	stems
<i>Taxodium distichum</i>	228
<i>Betula nigra</i>	70
Total (on 3.55 acres)	298

Faunal Surveys (Mammals)

The total number of trap-nights (one trap-night = one trap set for one night) during the trapping session was 306 (corrected for 9 traps that were closed, but unoccupied, when checked). Twenty-one small mammals were captured the first night, 16 the second night, and 19 the third night. The total number of captures was 56, which represented an overall trapping success $([\text{number of captures}/\text{number of trap-nights}] \times 100)$ of 18.3%.

Three species of rodents were caught – the white-footed mouse (*Peromyscus leucopus*), house mouse (*Mus musculus*) and the prairie vole (*Microtus ochrogaster*). The most frequently captured species was the white-footed mouse (21 individuals). No marsh rice rats (*Oryzomys palustris*) were captured.

Overall trapping success at this site was higher here than the previous three years and was surpassed only by the first year of trapping. Trapping success was 35.9% in 2005, 13.4% in 2006, 12.0% in 2007, and 4.0% in 2008. Unlike 2005 and 2006, no deer mice (*Peromyscus maniculatus*) were captured in the compensation site.

Five rice rats were caught in 2005 — one on the creek bank and four in the field in the southern portion of the compensation site. Only one rice rat was captured in 2006. It was in the northern portion of the compensation site, which had been released from cultivation that year. Rice rats may have deserted the compensation site in 2007 because it was dry. Alternatively, the small population of rice rats at the site may have been lost through local extirpation.

Summary and Recommendations

In the fifth and final year of monitoring, this restoration site is still making good progress. Rice rats (*Oryzomys*), present during the first two years, seem to have abandoned the site. The reasons for this are unclear. In the forest restoration the FQI (30.2 - quite good) and number of plant species present have increased every year. The percent nonnative or weedy species decreased in 2009 in the forest restoration and emergent wetland. The number of conservative plant species present continues to increase. In the first planting, greater than 80% of the original planting still survives (87%). The second planting is still well below the required 450/acre, however (53%). In 2009, 15.25 acres support hydrophytic vegetation, hydric spoils and wetland hydrology.

In 2009, less than 50% of species present in both communities are nonnative or weedy. However, both forest restoration and emergent wetland still have weedy native species among the three most dominant. The quality of vegetation in the emergent wetland would be improved by constructing a more permanent weir on the ditch that drains it. Although this area floods regularly, it appears that water exits rapidly via this ditch (the earthen berm is no longer in place). The weedy species at this site may be the result of extreme fluctuation in water level. Seven species present in 2008 in low numbers have the potential to persist and overwhelm some sites (*Phalaris arundinacea*, *Ambrosia trifida*, *Phragmites australis*, *Typha angustifolia*, *Solidago canadensis*, *Eleagnus umbellata*, *Lespedeza cuneata*). We recommend herbiciding the *Phragmites*. The second planting falls short of the required 450 trees/acre. At the Sugar Camp Creek site, 6.153 ha (15.2 acres) out of 7.65 ha (18.9 acres) have hydrophytic vegetation, hydric soil, and wetland hydrology in three of five years.

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**Appendix 1: Wetland Determinations
and Species Lists**

ROUTINE ON-SITE WETLAND DETERMINATION

Site 1 (page 1 of 5)

Field Investigators: Plocher, Wiesbrook, Brian Wilm **Date:** 16, 17 July 2009
Sect. No.: 102 (RS – 5, W –1) **Project Name:** FAP 312 (IL 3)
State: Illinois **County:** Franklin **Applicant:** IDOT District 9
Site Name: wet meadow/forest restoration
Legal Description: T. 5 S., R. 4 E., Sect. 32, SE/4 SE/4

Location: majority of the site

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>Solidago canadensis</i>	herb	FACU
2. <i>Agrostis alba</i>	herb	FACW
3. <i>Panicum virgatum</i>	herb	FAC+
4. <i>Aster simplex</i>	herb	FACW
5. <i>Eupatorium serotinum</i>	herb	FAC+

Percent of dominant species that are OBL, FACW, FAC+, or FAC: 80%

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

SOILS

Series and phase: Bonnie silt loam (Typic Fluvaquent)
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: Color: 10YR 4/4, 4/3, and 4/6
Redox Depletions? Yes: X No: Color: 2.5Y 5/2
Matrix color: 10YR 4/3 over 2.5Y 7/1 and 5/2

Other indicators: This soil is found in a level to depressional area along a creek and was saturated to the surface in some areas.

Hydric soils? Yes: X No:
Rationale: The Natural Resources Conservation Service identifies Bonnie as a Typic Fluvaquent that is poorly drained. The presence of redox concentrations and depletions within a low chroma matrix indicates conditions of saturation for long duration during the growing season. Therefore, the soil at this site meets the hydric soil criterion. This soil meets NRCS hydric soil indicator F3 – Depleted matrix.

ROUTINE ON-SITE WETLAND DETERMINATION

Site 1 (page 2 of 5)

Field Investigators: Plocher, Wiesbrook, Wilm **Date:** 16, 17 July 2009
Sect. No.: 102 (RS – 5, W –1) **Project Name:** FAP 312 (IL 3)
State: Illinois **County:** Franklin **Applicant:** IDOT District 9
Site Name: wet meadow/forest restoration
Legal Description: T. 5 S., R. 4 E., Sect. 32, SE/4 SE/4

Location: majority of the site

HYDROLOGY

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

Depth to saturated soil: 0.2 m (8 in)

Overview of hydrological flow through the system: Primary hydrologic inputs to this site are precipitation, runoff from the surrounding uplands and ditch/creek overflow. Evapotranspiration and sheetflow are the major outputs.

Size of watershed: 101 km² (39 mi²)

Other field evidence observed: This site is level to depressional. Drifflines were observed.

Wetland hydrology: Yes: X No:

Rationale: Field evidence cited above indicates that the 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 not coded by the NWI as wetland.

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ROUTINE ON-SITE WETLAND DETERMINATION

Site 1 (page 3 of 5)

Field Investigators: Plocher, Wiesbrook, Wilm **Date:** 16, 17 July 2009

Sect. No.: 102 (RS – 5, W –1) **Project Name:** FAP 312 (IL 3)

State: Illinois **County:** Franklin **Applicant:** IDOT District 9

Site Name: wet meadow/forest restoration

Legal Description: T. 5 S., R. 4 E., Sect. 32, SE/4 SE/4

Location: majority of the site

SPECIES LIST

Scientific name	Common name	Stratum	Wetland indicator status	C =
<i>Abutilon theophrasti</i>	velvet leaf	herb	FACU-	*
<i>Acer negundo</i>	box elder	shrub	FACW-	1
<i>Acer rubrum</i>	red maple	shrub/seedling	FAC	5
<i>Acer saccharinum</i>	silver maple	shrub/seedling	FACW	1
<i>Agrostis alba</i>	red top	herb	FACW	0
<i>Allium canadense</i>	wild garlic	herb	FACU	2
<i>Ambrosia trifida</i>	giant ragweed	herb	FAC+	0
<i>Andropogon virginicus</i>	broom sedge	herb	FAC-	1
<i>Apocynum sibiricum</i>	Indian hemp	herb	FAC+	2
<i>Asclepias incarnata</i>	swamp milkweed	herb	OBL	4
<i>Asclepias syriaca</i>	common milkweed	herb	UPL	0
<i>Aster ontarionis</i>	Ontario aster	herb	FAC	4
<i>Aster pilosus</i>	hairy aster	herb	FACU+	0
<i>Aster simplex</i>	panicled aster	herb	FACW	3
<i>Aster vimineus</i>	frost flower	herb	FACW-	3
<i>Betula nigra</i>	river birch	sapling	(planted)	4
<i>Bidens aristosa</i>	swamp marigold	herb	FACW	1
<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>Bromus commutatus</i>	hairy brome	herb	UPL	*
<i>Calystegia sepium</i>	American bindweed	herb	FAC	1
<i>Campsis radicans</i>	trumpet creeper	herb/woody vine	FAC	2
<i>Carex frankii</i>	sedge	herb	OBL	4
<i>Carex grayi</i>	Gray's sedge	herb	FACW+	6
<i>Carex lupulina</i>	hop sedge	herb	OBL	5
<i>Carex squarrosa</i>	sedge	herb	OBL	5
<i>Carex tribulooides</i>	sedge	herb	FACW+	3
<i>Carex vulpinoidea</i>	fox sedge	herb	OBL	3
<i>Carya illinoensis</i>	pecan	shrub	(planted)	6
<i>Cassia fasciculata</i>	partridge pea	herb	FACU-	1
<i>Celtis occidentalis</i>	hackberry	shrub	FAC-	3
<i>Cephalanthus occidentalis</i>	buttonbush	shrub/seedling	OBL	4
<i>Cicuta maculata</i>	water hemlock	herb	OBL	4
<i>Cirsium discolor</i>	field thistle	herb	UPL	3
<i>Commelina virginica</i>	day flower	herb	FACW	5
<i>Cornus drummondii</i>	rough leaf dogwood	shrub	FAC	2
<i>Cyperus ferruginescens</i>	flat sedge	herb	OBL	1
<i>Cyperus pseudovegatus</i>	flat sedge	herb	FACW	5
<i>Cyperus strigosus</i>	straw-colored flat sedge	herb	FACW	0
<i>Diodia virginiana</i>	large buttonweed	herb	FACW	4

= Coefficient of conservatism, as developed by Taft, Ladd, Wilhelm and Masters (1997) * nonnative species

Continued on following page

ROUTINE ON-SITE WETLAND DETERMINATION

Site 1 (page 4 of 5)

Field Investigators: Plocher, Wiesbrook, Wilm **Date:** 16, 17 July 2009

Sect. No.: 102 (RS – 5, W –1) **Project Name:** FAP 312 (IL 3)

State: Illinois **County:** Franklin **Applicant:** IDOT District 9

Site Name: wet meadow/forest restoration

Legal Description: T. 5 S., R. 4 E., Sect. 32, SE/4 SE/4

Location: majority of the site

SPECIES LIST (Continued)

Scientific name	Common name	Stratum	Wetland indicator status	C =
<i>Echinochloa muricata</i>	barnyard grass	herb	OBL	0
<i>Elaeagnus umbellata</i>	autumn olive	shrub/seedling	UPL	*
<i>Elymus virginicus</i>	Virginia wild rye	herb	FACW-	4
<i>Erechtites hieracifolia</i>	fire weed	herb	FACU	2
<i>Erigeron annuus</i>	annual fleabane	herb	FAC-	1
<i>Eupatorium coelestinum</i>	mist flower	herb	FAC+	3
<i>Eupatorium perfoliatum</i>	common boneset	herb	FACW+	4
<i>Eupatorium serotinum</i>	late flowering thoroughwort	herb	FAC+	1
<i>Euthamia graminifolia</i>	grassleaf goldenrod	herb	FACW-	3
<i>Festuca pratensis</i>	English bluegrass	herb	FACU-	*
<i>Fraxinus pennsylvanica</i>	green ash	shrub/seedling	FACW	2
<i>Galium tinctorium</i>	stiff bedstraw	herb	OBL	6
<i>Geum canadense</i>	white avens	herb	FAC	2
<i>Hibiscus lasiocarpus</i>	hairy rose mallow	herb	FACW+	5
<i>Hypericum mutilum</i>	dwarf St. Johns wort	herb	FACW	5
<i>Hypericum punctatum</i>	spotted St. John's wort	herb	FAC+	3
<i>Ipomoea hederacea</i>	ivy-leaved morning glory	herb	FAC	*
<i>Ipomoea lacunosa</i>	small white morning-glory	herb	FACW	1
<i>Ipomoea pandurata</i>	sweet potato vine	herb	FACU	2
<i>Iva annua</i>	marsh elder	herb	FAC	0
<i>Juncus biflorus</i>	two flowered rush	herb	FACW	5
<i>Juncus dudleyi</i>	Dudley's rush	herb	FAC	4
<i>Juncus effusus</i>	common rush	herb	OBL	4
<i>Juncus torreyi</i>	Torrey's rush	herb	FACW	3
<i>Lactuca canadensis</i>	wild lettuce	herb	FACU+	1
<i>Lactuca floridana</i>	blue lettuce	herb	FAC-	4
<i>Leersia oryzoides</i>	rice cutgrass	herb	OBL	3
<i>Lespedeza cuneata</i>	sericea lespedeza	herb	NI	*
<i>Liquidambar styraciflua</i>	sweet gum	shrub	FACW	6
<i>Lobelia cardinalis</i>	cardinal-flower	herb	OBL	6
<i>Lobelia inflata</i>	Indian tobacco	herb	FACU-	4
<i>Lonicera japonica</i>	Japanese honeysuckle	woody vine	FACU	*
<i>Lonicera maackii</i>	Amur honeysuckle	seedling	UPL	*
<i>Ludwigia alternifolia</i>	seedbox	herb	OBL	5
<i>Ludwigia polycarpa</i>	false loosestrife	herb	OBL	5
<i>Lycopus americanus</i>	water horehound	herb	OBL	3
<i>Lycopus virginicus</i>	bugle weed	herb	OBL	5
<i>Lysimachia nummularia</i>	moneywort	herb	FACW+	*
<i>Mimulus alatus</i>	monkey flower	herb	OBL	6
<i>Muhlenbergia frondosa</i>	satin grass	herb	FACW	3
<i>Oenothera biennis</i>	evening primrose	herb	FACU	1

= Coefficient of Conservatism, as developed by Taft, Ladd, Wilhelm and Masters (1997) * nonnative species

Continued on following page

ROUTINE ON-SITE WETLAND DETERMINATION

Site 1 (page 5 of 5)

Field Investigators: Plocher, Wiesbrook, Wilm **Date:** 16, 17 July 2009
Sect. No.: 102 (RS – 5, W –1) **Project Name:** FAP 312 (IL 3)
State: Illinois **County:** Franklin **Applicant:** IDOT District 9
Site Name: wet meadow/forest restoration
Legal Description: T. 5 S., R. 4 E., Sect. 32, SE/4 SE/4
Location: majority of the site

SPECIES LIST (Continued)

Scientific name	Common name	Stratum	Wetland indicator status	C=
<i>Oenothera pilosella</i>	prairie sundrops	herb	FAC-	6
<i>Oxalis stricta</i>	yellow wood sorrel	herb	FACU	0
<i>Panicum clandestinum</i>	deer tongue grass	herb	FACW	4
<i>Panicum dichotomiflorum</i>	fall panicum	herb	FACW-	0
<i>Panicum virgatum</i>	switchgrass	herb	FAC+	4
<i>Parthenocissus quinquefolia</i>	Virginia creeper	herb	FAC-	2
<i>Phalaris arundinacea</i>	reed canary grass	herb	FACW+	*
<i>Phyla lanceolata</i>	fog-fruit	herb	OBL	1
<i>Plantago rugelii</i>	red-stalked plantain	herb	FAC	0
<i>Platanus occidentalis</i>	sycamore	shrub/seedling	FACW	3
<i>Pluchea camphorata</i>	camphor weed	herb	FACW	7
<i>Polygonum scandens</i>	climbing false buckwheat	herb	FAC	2
<i>Populus deltoides</i>	cottonwood	shrub	FAC+	2
<i>Potentilla simplex</i>	common cinquefoil	herb	FACU-	3
<i>Prunella vulgaris elongata</i>	self-heal	herb	FAC	1
<i>Pycnanthemum tenuifolium</i>	slender mountain mint	herb	FAC	4
<i>Quercus bicolor</i>	swamp white oak	shrub	(planted)	7
<i>Quercus palustris</i>	pin oak	shrub	(planted)	4
<i>Quercus shumardii</i>	Shumard oak	shrub	(planted)	7
<i>Rhus coppalina</i>	winged sumac	shrub	UPL	2
<i>Rosa multiflora</i>	multiflora rose	shrub	FACU	*
<i>Rubus allegheniensis</i>	blackberry	shrub	FACU+	2
<i>Rudbeckia hirta</i>	black eyed Susan	herb	FACU	2
<i>Rudbeckia laciniata</i>	cutleaf coneflower	herb	FACW+	3
<i>Rumex altissimus</i>	pale dock	herb	FACW-	2
<i>Rumex crispus</i>	curly dock	herb	FAC+	*
<i>Salix nigra</i>	black willow	shrub	OBL	3
<i>Scirpus atrovirens</i>	dark green bulrush	herb	OBL	4
<i>Solidago canadensis</i>	Canada goldenrod	herb	FACU	1
<i>Solidago gigantea</i>	late goldenrod	herb	FACW	3
<i>Sonchus arvensis</i>	sow thistle	herb	FAC-	*
<i>Stachys palustris</i>	marsh hedge nettle	herb	OBL	5
<i>Toxicodendron radicans</i>	poison ivy	herb	FAC+	1
<i>Tragopogon pratensis</i>	common goat's beard	herb	UPL	*
<i>Ulmus americana</i>	American elm	shrub/seedling	FACW-	5
<i>Verbena hastata</i>	blue vervain	herb	FACW+	3
<i>Vernonia missurica</i>	Missouri ironweed	herb	FAC+	5
<i>Vitis riparia</i>	riverbank grape	herb/woody vine	FACW-	2
<i>Xanthium strumarium</i>	cocklebur	herb	FAC	0

= Coefficient of Conservatism (Taft et al. 1997)

* Non-native species

Percent weedy or nonnative: 35/116 = 30.2%

Percent native: 102/116 = 87.9%

$$mCv = \sum C/N = 291/102 = 2.85$$

$$FQI = \sum C/\sqrt{N} = 291/\sqrt{102} = 28.8 \quad \text{Quality} = \text{good}$$

$$mCv \text{ (with planted species)} = \sum C/N = 319/107 = 2.98$$

$$FQI \text{ (with planted species)} = \sum C/\sqrt{N} = 319/\sqrt{107} = 30.8$$

ROUTINE ON-SITE WETLAND DETERMINATION

Site 2 (page 1 of 4)

Field Investigators: Plocher, Wiesbrook, Wilm **Date:** 16, 17 July 2009
Sect. No.: 102 (RS – 5, W –1) **Project Name:** FAP 312 (IL 3)
State: Illinois **County:** Franklin **Applicant:** IDOT District 9
Site Name: wet meadow/oxbow
Legal Description: T. 5 S., R. 4 E., Sect. 32, SE/4 SE/4

Location: northwest portion of the site

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>Leersia oryzoides</i>	herb	OBL
3. <i>Xanthium strumarium</i>	herb	FAC

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

Series and phase: Bonnie silt loam (Typic Fluvaquent)

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:	Color: 10YR 4/4, 4/3, and 4/6
Redox Depletions?	Yes: X	No:	Color: 2.5Y 5/2

Matrix color: 10YR 4/3 over 2.5Y 7/1 and 5/2

Other indicators: This soil is found in a depressional area along a creek and is inundated.

Hydric soils? Yes: X No:

Rationale: The Natural Resources Conservation Service identifies Bonnie as a Typic Fluvaquent that is poorly drained. The presence of redox concentrations and depletions within a low chroma matrix indicates conditions of saturation for long duration during the growing season. Therefore, the soil at this site meets the hydric soil criterion. This soil meets NRCS hydric soil indicator F3 – Depleted matrix.

ROUTINE ON-SITE WETLAND DETERMINATION

Site 2 (page 2 of 4)

Field Investigators: Plocher, Wiesbrook, Wilm **Date:** 16, 17 July 2009
Sect. No.: 102 (RS – 5, W – 1) **Project Name:** FAP 312 (IL 3)
State: Illinois **County:** Franklin **Applicant:** IDOT District 9
Site Name: wet meadow/oxbow
Legal Description: T. 5 S., R. 4 E., Sect. 32, SE/4 SE/4

Location: northwestern portion of the site

HYDROLOGY

Inundated: Yes: X No: Depth of standing water: 0.15 m (6 in)

Depth to saturated soil: at surface

Overview of hydrological flow through the system: Primary hydrologic inputs to this site are precipitation, runoff from the surrounding uplands and ditch/creek overflow. Evapotranspiration and sheetflow are the major outputs.

Size of watershed: 101 km² (39 mi²)

Other field evidence observed: This site is depressional. Driftlines and bare areas were observed.

Wetland hydrology: Yes: X No:

Rationale: Field evidence cited above indicates that the 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 not coded by the NWI as wetland.

Determined by: Allen Plocher (vegetation and hydrology)
Scott Wiesbrook (soils and hydrology)
Brian Wilm (vegetation and hydrology)
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ROUTINE ON-SITE WETLAND DETERMINATION

Site 2 (page 3 of 4)

Field Investigators: Plocher, Wiesbrook, Wilm **Date:** 16, 17 July 2009
Sect. No.: 102 (RS – 5, W –1) **Project Name:** FAP 312 (IL 3)
State: Illinois **County:** Franklin **Applicant:** IDOT District 9
Site Name: wet meadow/oxbow
Legal Description: T. 5 S., R. 4 E., Sect. 32, SE/4 SE/4
Location: northwestern portion of the site

SPECIES LIST

Scientific name	Common name	Stratum	Wetland indicator status	C=
<i>Amaranthus tuberculatus</i>	water hemp	herb	OBL	1
<i>Ammannia coccinea</i>	ammannia	herb	OBL	5
<i>Asclepias incarnata</i>	swamp milkweed	herb	OBL	4
<i>Aster ontariensis</i>	Ontario aster	herb	FAC	4
<i>Aster simplex</i>	panicked aster	herb	FACW	3
<i>Betula nigra</i>	river birch	herb	(planted)	4
<i>Bidens aristosa</i>	swamp marigold	herb	FACW	1
<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>Campsis radicans</i>	trumpet creeper	herb	FAC	2
<i>Carex lupulina</i>	hop sedge	herb	OBL	5
<i>Carex tribuloides</i>	sedge	herb	FACW+	3
<i>Carex vulpinoidea</i>	fox sedge	herb	OBL	3
<i>Cephalanthus occidentalis</i>	button bush	shrub	OBL	4
<i>Cicuta maculata</i>	water hemlock	herb	OBL	4
<i>Cyperus ferruginescens</i>	flat sedge	herb	OBL	1
<i>Cyperus pseudovegatus</i>	flat sedge	herb	FACW	5
<i>Cyperus strigosus</i>	straw colored flat sedge	herb	FACW	0
<i>Diodia virginiana</i>	large buttonweed	herb	FACW	4
<i>Echinochloa muricata</i>	barnyard grass	herb	OBL	0
<i>Eclipta prostrata</i>	yerba de tajo	herb	FACW	2
<i>Eleocharis erythropoda</i>	red rooted spikerush	herb	OBL	3
<i>Elymus virginicus</i>	Virginia wild rye	herb	FACW-	4
<i>Eupatorium serotinum</i>	late flowering thoroughwort	herb	FAC+	1
<i>Fraxinus pennsylvanica</i>	green ash	shrub	FACW	2

= Coefficient of conservatism, as developed by J. Taft, D. Ladd, G. Wilhelm and L. Masters (1997)

* nonnative species

Continued on following page

ROUTINE ON-SITE WETLAND DETERMINATION

Site 2 (page 4 of 4)

Field Investigators: Plocher, Wiesbrook, Wilm **Date:** 16, 17 July 2009
Sect. No.: 102 (RS – 5, W –1) **Project Name:** FAP 312 (IL 3)
State: Illinois **County:** Franklin **Applicant:** IDOT District 9
Site Name: wet meadow/oxbow
Legal Description: T. 5 S., R. 4 E., Sect. 32, SE/4 SE/4

Location: northwestern portion of the site

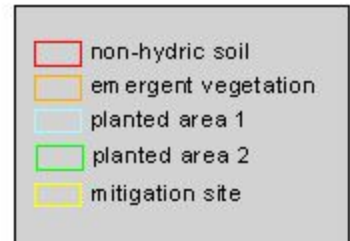
SPECIES LIST (Continued)

Scientific name	Common name	Stratum	Wetland indicator status	C =
<i>Ipomoea hederacea</i>	ivy leaf morning glory	herb	FAC	*
<i>Ipomoea lacunosa</i>	small white morning glory	herb	FACW	1
<i>Iva annua</i>	sumpweed	herb	FAC	0
<i>Juncus biflorus</i>	two flowered rush	herb	FACW	5
<i>Juncus dudleyi</i>	Dudley's rush	herb	FAC	4
<i>Leersia oryzoides</i>	rice cut grass	herb	OBL	3
<i>Lycopus americanus</i>	water horehound	herb	OBL	3
<i>Lycopus virginicus</i>	bugleweed	herb	OBL	5
<i>Panicum rigidulum</i>	Munro grass	herb	FACW	6
<i>Panicum virgatum</i>	switchgrass	herb	FAC+	4
<i>Phalaris arundinacea</i>	reed canarygrass	herb	FACW+	*
<i>Phragmites australis</i>	common reed	herb	FACW+	1
<i>Phyla lanceolata</i>	fog fruit	herb	OBL	1
<i>Polygonum lapathifolium</i>	nodding smartweed	herb	FACW+	0
<i>Polygonum pennsylvanicum</i>	giant smartweed	herb	FACW+	1
<i>Polygonum punctatum</i>	dotted smartweed	herb	OBL	3
<i>Rorippa islandica</i>	marsh yellow cress	herb	OBL	4
<i>Rumex altissimus</i>	pale smartweed	herb	FACW-	2
<i>Salix nigra</i>	black willow	shrub	OBL	3
<i>Scirpus atrovirens</i>	dark green bulrush	herb	OBL	4
<i>Sida spinosa</i>	prickly sida	herb	FACU	*
<i>Stachys palustris</i>	marsh hedge nettle	herb	OBL	5
<i>Taxodium distichum</i>	bald cypress	shrub	(planted)	*
<i>Typha angustifolia</i>	narrow leaf cattail	herb	OBL	*
<i>Xanthium strumarium</i>	cocklebur	herb	FAC	0

= Coefficient of Conservatism (Taft et al. 1997)	$mCv = \sum C/N = 125/45 = 2.78$
* Non-native species	$FQI = \sum C/\sqrt{N} = 130/\sqrt{45} = 18.6$ Quality = fair
Percent weedy or non-native: 13/49 = 26.5%	mCv (with planted species) = $\sum C/N = 129/46 = 2.80$
Percent native: 45/49 = 91.8%	FQI (with planted species) = $\sum C/\sqrt{N} = 129/\sqrt{46} = 19.0$

Wetland Mitigation Monitoring - 2009
FAP 312 (IL 3), Willis Property
Franklin County

figure 2



scale 1:4800
1 inch=400 ft

