

# WETLAND MITIGATION SITE MONITORING REPORT-2005

## FAP 310 (US 67) Mercer County

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### Introduction

This report details the seventh year monitoring for the wetland mitigation site created to compensate for impact to wetlands by construction on FAP 310 (US 67) in Mercer County. Details of the first six years of monitoring can be found in the five previously submitted reports (Feist et al. 1999, Feist et al. 2000, Feist et al. 2001, Feist et al. 2002, Feist et al. 2003, and Feist et al. 2004). The site is divided into two parts, a wetland creation (Site 1) approximately 0.69 ha (1.7 ac) in size and a wetland restoration (Site 2) approximately 0.28 ha (0.7 ac) in size. Monitoring of Site 2 was completed in 2003, however, monitoring of Site 1 will continue until 2007. The wetland creation (Site 1) is located in the southeast quarter of the intersection of U S Route 67 and the Edwards River. The legal location is NE 1/4, SW 1/4, Section 35, T. 15 N., R. 2 W. The Illinois Department of Transportation (IDOT) completed construction of the site on 12 August 1997. Trees were planted during the fall of 1998 (T. Brooks, IDOT Wetlands Unit, memo to Allen Plocher, 10 February 1999). Additional trees were planted at the site on 18 November 2004 in order to meet the performance standard of an 80% tree survival rate (Joseph E. Crowe, Deputy IDOT, Director of Highways, memo to Donna M. Jones, Chief, Enforcement Section, USACE, 18 January, 2005). The seventh year of onsite monitoring was conducted on 2 August 2005.

This report discusses the goals, objectives, and performance criteria for the mitigation project, the methods used for monitoring the site, monitoring results, and a discussion and recommendations based on the results. Methods and results are discussed by performance criteria for each goal.

### Goals, Objectives, and Performance Standards

Goals, objectives, and performance standards follow those specified in the monitoring plan (T. Brooks, IDOT Wetlands Unit, 1999) and the wetland compensation plan (C. Perino, IDOT Wetlands Unit, 1996) developed for this site. Performance criteria are based on those specified in the *Corps of Engineers Wetlands Delineation Manual* (Environmental Laboratory 1987) and in *Guidelines for Developing Mitigation Proposals* (USACE 1993). Each goal should be attained by the end of the 5-year monitoring period. Goals, objectives, and performance criteria are listed below.

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

**Objective:** The created wetland should compensate for the loss of 0.31 ha (0.76 ac) of floodplain forest and 0.09 ha (0.23 ac) of emergent wetland at a 1.5:1 ratio.

**Performance criteria:**

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

b. Presence of wetland hydrology: The area must be either permanently or periodically inundated at average depths less than 2 m (6.6 ft) or have soils that are saturated to the surface for at least 12.5% of the growing season.

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

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

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

**Performance criteria:**

a. Establishment of tree seedlings: Planted or volunteer tree seedlings should be established at each site. There should be at least an 80% survival rate for planted trees.

b. Floristic Quality Assessment: The floristic quality index (FQI) and mean coefficient of conservatism ( $\bar{c}$ ) for both sites should meet or exceed the FQI and  $\bar{c}$  values of the filled wetlands, 7.0 and 2.0, respectively.

c. Dominance of vegetation: None of the three most dominant plant species in either site may be non-native species, cattails (*Typha* spp.), or reed canary grass (*Phalaris arundinacea*).

**Project goal 3:** The created wetland should function to remove sediments from the floodwaters of the Edwards River.

**Objectives:** The wetland creation site should retain floodwater and allow sediments to settle out of suspension.

**Performance criteria:**

a. Sediment removal: Sediments in the wetland should accumulate at a rate of 0.3 to 1.1 in/yr.

## Methods

### Project goal 1

#### a. Predominance of hydrophytic vegetation

The method for determining dominant vegetation at a wetland site is described in the *Corps of Engineers Wetlands Delineation Manual* (Environmental Laboratory 1987) and further explained in the *Federal Manual for Identifying and Delineating Jurisdictional Wetlands* (Federal Interagency Committee for Wetland Delineation 1989). It is based on aerial coverage estimates for individual plant species. Each of the dominant plant species is assigned its wetland indicator status rating (Reed 1988). Any plant rated facultative or wetter, *i.e.*, FAC, FAC+, FACW, and OBL, is considered a hydrophyte. A predominance of vegetation in the wetland plant community exists if more than 50% of the dominant species present are hydrophytic.

#### b. Presence of wetland hydrology

Illinois State Geological Survey (ISGS) personnel installed seven ground water monitoring wells and one stage gauge at the created wetland site (Site 1) in 1999. In 2001, one RDS surface-water data logger, one stage gauge, and three very shallow (VS) soil zone wells were added. In April 2002 three soil-zone monitoring wells were added along the base of the US 67 embankment. A figure showing the locations of these sites can be found in Appendix A. Water-level data was collected monthly throughout the year and biweekly during April and May. Methods are further described in the ISGS document *Annual report for active IDOT wetland compensation and hydrologic monitoring sites: September 1, 2003 to September 1, 2004* (Fucciolo et al. 2004).

#### c. Occurrence of hydric soils

The soil was sampled in order to monitor hydric soil development. Soil profile morphology including horizon color, texture, and structure was described at various points throughout the site. Additionally, the presence, type, size, and abundance of redoximorphic features were noted.

Hydric soils typically develop slowly, and characteristics may not be apparent during the first several years after project construction. In the absence of hydric soil indicators at the end of the five-year monitoring period, hydrologic data could be used as corroborative evidence that conditions favorable for hydric soil formation persist at the site.

### Project goal 2

#### a. Establishment of trees (five-foot whips)

In order to help create and restore floodplain forest, five-foot whips were planted at the mitigation site. According to the tasking order for this project (T. Brooks, IDOT Wetlands Unit, memo to Allen Plocher, 10 February 1999), the following number of trees was planted at Site 1 in the fall of 1998:

Table 1. Species planted in the wetland creation (Site 1) in 1998.

Species	Common Name	Number
<i>Acer rubrum</i>	red maple	60
<i>Betula nigra</i>	river birch	60
<i>Quercus bicolor</i>	swamp white oak	60
<i>Quercus palustris</i>	pin oak	60

According to a memo from Joseph E. Crowe, Deputy IDOT, Director of Highways, to Donna M. Jones, Chief, Enforcement Section, USACE on 18 January 2005, additional trees were planted at the site on 18 November 2004 in order to meet the performance standard of an 80% tree survival rate. The number and species of trees planted in 2004 are shown in Table 2.

Table 2. Species planted in the wetland creation (Site 1) in 2004.

Species	Common Name	Number
<i>Betula nigra</i>	river birch	25
<i>Carya illinoensis</i>	pecan	25
<i>Fraxinus pennsylvanica</i>	Green ash	50
<i>Quercus bicolor</i>	swamp white oak	50

Survivorship and density of planted trees was determined by censusing. All live planted trees were counted. Volunteer seedlings were designated as occasional or abundant by species.

Density of live planted trees is given as the number of live planted trees/ha. Survival was calculated as a percentage of the number of expected live individuals: (Total number of live planted trees/the number of known planted trees) x 100.

#### b. Floristic Quality Assessment

The Floristic Quality Assessment (Taft et al. 1997) was applied to the plant community at the site to evaluate floristic quality and nativity. The assessment methodology is used to identify natural areas and facilitate floristic comparisons among sites. This technique is part of the procedure for the long-term monitoring of natural areas and the monitoring of restored or created wetlands (Swink and Wilhelm 1994). The premise of the method is that each native plant species is assigned a conservatism coefficient (C) ranging from 0 to 10. Individual conservatism coefficients are ranks of species behavior and reflect the committee's (Taft et al. 1997) confidence level for a taxon's correspondence to anthropogenic disturbances. Coefficient values range from 0 to 10. Plant species assigned 0 have low affinities for natural areas, whereas those assigned 10 have very high affinities. When a complete species list is assembled for a wetland site, the overall average conservatism coefficient ( $\bar{c}$ ) and a site floristic quality index (FQI) can be calculated. These values provide a measure of site floristic quality. Floristic quality index values (FQI values) less than 5 indicate that the area is extremely weedy or in an early successional stage (Swink and Wilhelm 1994). FQI values between 20 and 35 ( $\bar{c} = 3.0$ ) indicate that the area has evidence of native character and can

be considered a botanical asset. FQI values between 35 and 50 ( $\bar{c} = 3.5$ ) indicate that the area has significant native character.

c. Dominance of vegetation

Plant species dominance was determined as in Project Goal 1, a. Predominance of hydrophytic vegetation. The method for determining dominant vegetation at a wetland site is described in the *Corps of Engineers Wetlands Delineation Manual* (Environmental Laboratory 1987) and further explained in the *Federal Manual for Identifying and Delineating Jurisdictional Wetlands* (Federal Interagency Committee for Wetland Delineation 1989).

In addition, three permanent photography stations were established so that photographs could be used to document changes in plant community size and composition. The locations of the photo stations are indicated on the enclosed aerial photograph. Arrows indicate the direction in which the photos were taken.

**Project goal 3**

a. Sediment removal

ISGS personnel installed 12 sediment traps in the wetland creation site (Site 1) in fall 1999. Trap locations are shown in the figure in Appendix A.

**Results**

**Project goal 1**

a. Predominance of hydrophytic vegetation

Dominant plant species for the mitigation site in 2004 are shown in Table 3. At Site 1, 83.3% of the dominant species are rated OBL, FACW+, FAC+, or FAC and are hydrophytic.

Table 3. Dominant plant species by stratum and wetland indicator status for the wetland creation (Site 1).

<b>Dominant Plant Species</b>	<b>Indicator Status</b>	<b>Stratum</b>
1. <i>Acer saccharinum</i>	FACW	shrub
2. <i>Populus deltoides</i>	FAC+	shrub
3. <i>Aster simplex</i>	FACW	herb
4. <i>Phalaris arundinacea</i>	FACW+	herb
5. <i>Solidago canadensis</i>	FACU	herb
6. <i>Solidago gigantea</i>	FACW	herb

b. Presence of wetland hydrology

The figure in Appendix A shows the areal extent of wetland hydrology at Site 1 in 2005. Benton and Carr (2005) found that there was no part of the wetland that satisfied the wetland criteria for greater than either 5% or 12.5% of the growing season in 2005. Water levels measured in no wells conclusively satisfied the wetland hydrology criteria for either 5% or 12.5% of the growing season (Benton and Carr 2005). There was no surface-water inundation event recorded in the wetland basin in 2005. For a more detailed account of the

hydrology of this site, see *Edwards River/Mercer County Wetland Compensation Site, I.S.G.S. #50* (Benton and Carr 2005).

c. Occurrence of hydric soils

Soil sampling was again much easier on the creation site than in the first years of monitoring. This and continued horizonation is evidence of continued soil development on the site. Evidence of disturbance within the soil profile was again less obvious this year.

Hydric soil indicators are present. Following (Table 4) is a soil description of a typical pedon for the majority of the site.

Table 4. Description of the soils at the created wetland (site 1).

<u>Depth</u> inches	<u>Matrix</u> <u>Color</u>	<u>Concrete</u> <u>-tions</u>	<u>Pore</u> <u>linings</u>	<u>Iron</u> <u>Deplet.</u>	<u>Clay</u> <u>Deplet.</u>	<u>Tex-ture</u>	<u>Structure</u>
0-5	10YR 2.5/1	7.5YR 2.5/3	None	None	None	Silty Clay Loam	Granular to Subangular-Blocky
5-16	10YR 2.5/1	5YR 3/4	None	None	None	Silty Clay Loam	Subangular-Blocky
16-30	10YR 2.5/1	2.5YR 4/6	None	None	None	Silty Clay Loam	Subangular-Blocky

**Project goal 2**

a. Establishment of tree seedlings

Table 5 shows the results of the censusing of trees planted in 1998 at Site 1 in 2005. No *Acer rubrum* were ever found at the created wetland site. Most likely, the reported number of *Acer rubrum* was never planted at the site. Therefore, I have calculated percent survival both with and without *Acer rubrum* included. Numbers in parentheses in Table 5 and the text below were calculated without *Acer rubrum* included. Of the trees planted in 1998, a total of 115 live planted trees are present for a survival rate of approximately 47.9% (63.9%)

Table 5. Tree establishment at the wetland creation (Site 1) for 2005 of trees planted in 1998.

Species	Number planted	Number live trees	Percent survival
<i>Acer rubrum</i>	60	0	0.0%
<i>Betula nigra</i>	60	51	85%
<i>Quercus bicolor</i>	60	44	73.3%
<i>Quercus palustris</i>	60	20	33.3%
<b>Total</b>	240 (180)	115 (115)	47.9% (63.9%)

Table 6 shows the results of the 2005 censusing of trees planted in 2004 at Site 1. Of the trees planted in 2004, a total of 72 live planted trees are present for a survival rate of 48%. The combined total of live planted trees present at the site is 187, 77.9% of the total number of trees reported as planted in 1998. This is just under the performance criterion of 80% survival of live planted trees.

Table 6. Tree establishment at the wetland creation (Site 1) for 2005 of trees planted in 2004.

Species	Number planted	Number live trees	Percent survival
<i>Betula nigra</i>	25	3	12 %
<i>Carya illinoensis</i>	25	9	36 %
<i>Fraxinus pennsylvanica</i>	50	31	62 %
<i>Quercus bicolor</i>	50	29	58 %
<b>Total</b>	150	72	48 %

Both planted tree seedlings and volunteers are becoming established the site. There is a density of 271 live planted trees/ha (110 live planted trees/ac). Volunteer silver maple and cottonwood shrubs now outnumber the planted trees and are dominant at this site. Some have even reached the size of saplings. Volunteer sandbar willow and black willow shrubs are present in thick patches along the borders of the site.

b. Floristic Quality Assessment

Two FQI values were calculated from the species lists included in Appendix B. The first FQI value is calculated from only species that became established on the site naturally; the second FQI value includes the planted tree species. The created wetland (Site 1) has an FQI value of 16.0 and a  $\bar{c}$  of 2.0 when only natural vegetation is included. When the planted tree species are added, the FQI value is raised to 17.5 with a  $\bar{c}$  value of 2.1. In both cases, the FQI values exceed the requirement of 7.0, and the  $\bar{c}$  values are slightly higher than the required 2.0. FQI and  $\bar{c}$  values have increased steadily over the past six years of monitoring.

c. Dominance of vegetation

Site 1 no longer meets the performance criterion for dominance of vegetation. As reported previously (Feist et al. 2001, Feist et al. 2002, Feist et al. 2003), the amount of *Phalaris arundinacea* (reed canary grass) at the site has steadily increased over the past five years. It is now a dominant (Table 3). As a result, the performance criterion that none of the three most dominant plant species at either site may be non-native species, cattails (*Typha* sp.), or reed canary grass (*Phalaris arundinacea*), is violated.

Photographs were taken from the permanent photography stations and are included in Appendix C of this report.

**Project goal 3**

a. Sediment removal

Sediment traps at Site 1 were examined by ISGS personnel in April 2004. They reported that the traps on the site accumulated an average thickness of 0.70 cm (0.27 in) of sediment in 2005 (Benton and Carr 2005).

**Discussion**

After the seventh year of monitoring, the created wetland site (Site 1) does not comply with all of the project goals, objectives, and performance standards. Although the planted trees and other hydrophytic vegetation are becoming established and hydric soil indicators were found, an exotic species (reed canary grass) has become established as a dominant and the wetland hydrology criteria have not been met in most years. The criteria for wetland

hydrology were met for the entire excavated basin in 2001 (Weaver and Carr 2001) and for a portion of the basin in 2002 (26%) and 2004 (52%) (Weaver and Carr 2002, Weaver and Carr 2004). However, in 2000 and 2003 only a small area around one well (1S and 3S respectively) met the criteria (Carr and Weaver 2000, Weaver and Carr 2003), and in 1999 and 2005 no portion of the site did (Miner 1999; Benton and Carr 2005).

The problem with wetland hydrology at this site was believed to be the inlet/outlet located at the northwest corner of the site. The elevation of this inlet/outlet allowed the site to drain too quickly after flooding events. In April 2005 a berm was constructed at the northwest corner of the site to solve this problem and increase the amount of water retention in the wetland basin. However, precipitation during the growing season in 2005 was only 61% of normal and no flood event of the Edwards River occurred at this time (Benton and Carr 2005). Therefore, the effectiveness of the berm was impossible to determine in 2005.

Volunteer and planted tree species are becoming well established at Site 1. The survival rate for the planted trees was 77.9% and numerous cottonwoods and silver maples have colonized the site. The dominant vegetation is hydrophytic and the FQI and  $\bar{c}$  values are above the required level. However, a non-native invasive, reed canary grass, is among the top three dominants. This invasive grass has the potential to take over the site and exclude other species. It may not be a problem in the future because once a dense forest canopy is established it should be shaded out, however, its progress should be monitored.

Soils have been seriously disturbed. Even so, the soils at the created wetland (Site 1) contain hydric soil indicators, and therefore can be characterized as hydric.

In summary, the site has adequate floristic quality, hydrophytic vegetation, and hydric soils. It also has wetland hydrology in some years. Hydrologic alterations were carried out in 2005 and additional trees were planted that brought the number of live planted trees to very close to 80% of the original number reported as planted at the site. Considerable natural vegetation is also present including sapling-sized cottonwoods and silver maples. Although reed canary grass is now dominant, we feel that after seven years, this marginal site is now as close to adequate performance as it will make.

### **Literature Cited**

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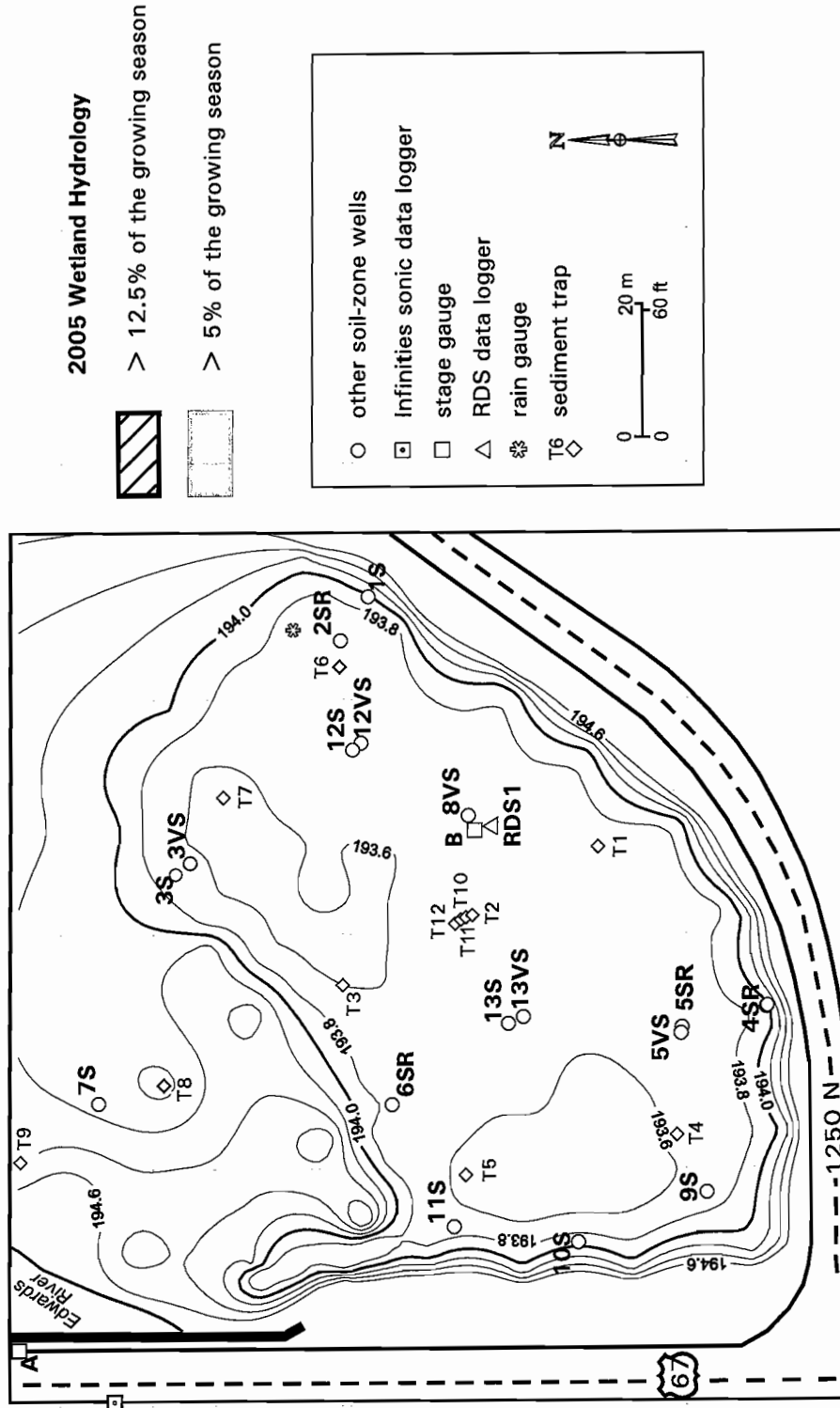
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**Appendix A**  
**Hydrologic Information**

# Edwards River, Mercer County Wetland Compensation Site (FAP 310)

**Estimated Areal Extent of 2005 Wetland Hydrology**  
 based on data collected between September 1, 2004 and September 1, 2005  
 Map based on 2002 ISGS elevation survey referenced to NGVD, 1929  
 contour interval is 0.2 meters



**Appendix B**  
**Wetland Determination Forms**

**ROUTINE ONSITE WETLAND DETERMINATION**  
Site 1 (page 1 of 6)

**Field Investigators:** Feist, Kurylo, and Tessene  
**Date:** 2 August 2005      **Project Name:** FAP 310 (US 67)  
**Section No.:** 104RS-2, (104)BR, (104-1)BR, 105RS-2  
**State:** Illinois      **County:** Mercer      **Applicant:** IDOT District 4  
**Site Name:** Wetland creation  
**Legal Description:** NE 1/4, SW 1/4, Sec. 35, T. 15 N., R. 2 W  
**Location:** This wetland creation site is located 38.1 m (125 ft) south of the Edwards River and 15.2 m (50 ft) east of US 67.

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

**VEGETATION**

<b>Dominant Plant Species</b>	<b>Indicator Status</b>	<b>Stratum</b>
1. <i>Acer saccharinum</i>	FACW	shrub
2. <i>Populus deltoides</i>	FAC+	shrub
3. <i>Aster simplex</i>	FACW	herb
4. <i>Phalaris arundinacea</i>	FACW+	herb
5. <i>Solidago canadensis</i>	FACU	herb
6. <i>Solidago gigantea</i>	FACW	herb

Percentage of dominant species that are OBL, FACW, FAC+, or FAC: 83.3%

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

**SOILS**

Series and phase: Undetermined.  
On county hydric soils list?      Yes:      No:      Undetermined: X  
Is the soil a histosol?      Yes:      No: X  
Histic epipedon present?      Yes:      No: X  
Redox concentrations:      Yes: X      No:      Color: 7.5YR 2.5/3 and 5YR 3/4  
Redox depletions:      Yes:      No: X  
Matrix color: 10YR 2.5/1  
Other indicators: None.

**Hydric soils:** Yes: X      No:  
**Rationale:** This soil has a low chroma matrix and redox concentrations. Therefore, this is a hydric soil. This soil also meets the hydric soil indicator F6 – Redox Dark Surface from the NRCS.

**ROUTINE ONSITE WETLAND DETERMINATION**  
Site 1 (page 2 of 6)

**Field Investigators:** Feist, Kurylo, and Tessene  
**Date:** 2 August 2005      **Project Name:** FAP 310 (US 67)  
**Section No.:** 104RS-2, (104)BR, (104-1)BR, 105RS-2  
**State:** Illinois      **County:** Mercer      **Applicant:** IDOT District 4  
**Site Name:** Wetland creation  
**Legal Description:** NE 1/4, SW 1/4, Sec. 35, T. 15 N., R. 2 W  
**Location:** This wetland creation site is located 38.1 m (125 ft) south of the Edwards River and 15.2 m (50 ft) east of US 67.

**HYDROLOGY**

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

Depth to saturated soil: > 0.46 m (18 in)

Overview of hydrological flow through the system: This site is hydrologically influenced by overflow from the Edwards River, precipitation, and runoff from surrounding higher ground. Water leaves the site primarily through an inlet/outlet at the northwest corner of the site leading into the nearby Edwards River and also via evapotranspiration and soil infiltration.

Size of Watershed: 699 km<sup>2</sup> (270 mi<sup>2</sup>)

Other field evidence observed: This site is a low area in the floodplain of a fairly large river.

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

**Rationale:** Over six years of monitoring, no well or portion of this site met the wetland hydrology criteria for more than three out of seven years. The criteria for wetland hydrology were met for the entire excavated basin in 2001 (Weaver and Carr 2001) and for a portion of the basin in 2002 (26%) and 2004 (52%) (Weaver and Carr 2002). However, in 2000 and 2003 only a small area around one well (1S and 3S respectively) met the criteria (Carr and Weaver 2000, Weaver and Carr 2003), and in 1999 and 2005 no portion of the site satisfied the wetland hydrology criteria (Miner 1999; Benton and Carr 2005).

**DETERMINATION AND RATIONALE:**

**Is the site a wetland?** Yes:      No: X

**Rationale:** Although dominant hydrophytic vegetation and hydric soils are present throughout this site, wetland hydrology is not. The NWI did not code this site as a wetland.

**ROUTINE ONSITE WETLAND DETERMINATION**

Site 1 (page 3 of 6)

**Field Investigators:** Feist, Kurylo, and Tessene

**Date:** 2 August 2005

**Project Name:** FAP 310 (US 67)

**Section No.:** 104RS-2, (104)BR, (104-1)BR, 105RS-2

**State:** Illinois

**County:** Mercer

**Applicant:** IDOT District 4

**Site Name:** Wetland creation

**Legal Description:** NE 1/4, SW 1/4, Sec. 35, T. 15 N., R. 2 W

**Location:** This wetland creation site is located 38.1 m (125 ft) south of the Edwards River and 15.2 m (50 ft) east of US 67.

**SPECIES LIST**

Scientific name	Common name	Stratum	Wetland indicator status	C†
<i>Abutilon theophrasti</i>	velvet-leaf	herb	FACU-	*
<i>Acalypha rhomboidea</i>	three-seeded mercury	herb	FACU	0
<i>Acer negundo</i>	box elder	shrub, seedling	FACW-	1
<i>Acer saccharinum</i>	silver maple	sapling, shrub, seedling	FACW	1
<i>Agropyron repens</i>	quack grass	herb	FACU	*
<i>Amaranthus tuberculatus</i>	tall waterhemp	herb	OBL	1
<i>Ambrosia artemisiifolia</i>	common ragweed	herb	FACU	0
<i>Ambrosia trifida</i>	giant ragweed	herb	FAC+	0
<i>Apocynum cannabinum</i>	dogbane	herb	FAC	2
<i>Asclepias incarnata</i>	swamp milkweed	herb	OBL	4
<i>Asclepias syriaca</i>	common milkweed	herb	UPL	0
<i>Aster pilosus</i>	hairy aster	herb	FACU+	0
<i>Aster praealtus</i>	willow-leaved aster	herb	FACW	4
<i>Aster simplex</i>	paniced aster	herb	FACW	3
<i>Bidens aristosa</i>	swamp marigold	herb	FACW	1
<i>Bidens cernua</i>	nodding beggar-ticks	herb	OBL	2
<i>Bidens connata</i>	purplestem beggar-ticks	herb	OBL	2
<i>Bidens frondosa</i>	common beggar-ticks	herb	FACW	1
<i>Calystegia sepium</i>	American bindweed	herb	FAC	1
<i>Carex annectens</i>	large yellow fox sedge	herb	FACW	3
<i>Carex conjuncta</i>	green-headed fox sedge	herb	FACW	5
<i>Carex frankii</i>	sedge	herb	OBL	4
<i>Carex scoparia</i>	broom sedge	herb	FACW	5
<i>Carex vulpinoidea</i>	fox sedge	herb	OBL	3
<i>Cirsium vulgare</i>	bull thistle	herb	FACU-	*
<i>Conyza canadensis</i>	horseweed	herb	FAC-	0
<i>Cynanchum laeve</i>	blue vine	vine	FAC	1
<i>Cyperus esculentus</i>	yellow nut-sedge	herb	FACW	0
<i>Cyperus strigosus</i>	straw colored flatsedge	herb	FACW	0
<i>Daucus carota</i>	Queen-Anne's-lace	herb	UPL	*
<i>Echinochloa muricata</i>	barnyard grass	herb	OBL	0

Species list continued on next page.



**ROUTINE ONSITE WETLAND DETERMINATION**

Site 1 (page 4 of 6)

**Field Investigators:** Feist, Kurylo, and Tessene

**Date:** 2 August 2005      **Project Name:** FAP 310 (US 67)

**Section No.:** 104RS-2, (104)BR, (104-1)BR, 105RS-2

**State:** Illinois      **County:** Mercer      **Applicant:** IDOT District 4

**Site Name:** Wetland creation

**Legal Description:** NE 1/4, SW 1/4, Sec. 35, T. 15 N., R. 2 W

**Location:** This wetland creation site is located 38.1 m (125 ft) south of the Edwards River and 15.2 m (50 ft) east of US 67.

**SPECIES LIST** *continued*

Scientific name	Common name	Stratum	Wetland indicator status	C†
<i>Eleocharis erythropoda</i>	spike rush	herb	OBL	3
<i>Elymus virginicus</i>	Virginia wild rye	herb	FACW-	4
<i>Erigeron annuus</i>	annual fleabane	herb	FAC-	1
<i>Eupatorium serotinum</i>	late boneset	herb	FAC+	1
<i>Gaura biennis</i>	biennial gaura	herb	FACU-	2
<i>Geum laciniatum</i>	rough avens	herb	FACW	2
<i>Fraxinus pennsylvanica</i>	green ash	shrub	FACW	2
<i>Hackelia virginiana</i>	stickseed	herb	FAC-	1
<i>Helianthus tuberosus</i>	Jerusalem artichoke	herb	FAC	3
<i>Ipomoea hederacea</i>	ivy-leaved morning glory	herb	FAC	*
<i>Leersia oryzoides</i>	rice cutgrass	herb	OBL	3
<i>Lotus corniculatus</i>	birdsfoot-trefoil	herb	FAC-	*
<i>Lycopus virginicus</i>	bugle weed	herb	OBL	5
<i>Mentha arvensis villosa</i>	field mint	herb	FACW	4
<i>Morus alba</i>	white mulberry	shrub, herb	FAC	*
<i>Oxalis dillenii</i>	yellow wood sorrel	herb	FACU	0
<i>Phalaris arundinacea</i>	reed canary grass	herb	FACW+	*
<i>Physostegia virginiana</i>	false dragonhead	herb	FACW	6
<i>Pilea pumila</i>	Canada clearweed	herb	FACW	3
<i>Plantago lanceolata</i>	lance-leaved plantain	herb	FAC	*
<i>Poa pratensis</i>	Kentucky bluegrass	herb	FAC-	*
<i>Polygonum amphibium</i>	water smartweed	herb	OBL	3
<i>Polygonum lapathifolium</i>	curly top lady's thumb	herb	FACW+	0
<i>Polygonum pennsylvanicum</i>	giant smartweed	herb	FACW+	1
<i>Polygonum punctatum</i>	dotted smartweed	herb	OBL	3
<i>Polygonum scandens</i>	climbing buckwheat	herb	FAC	2
<i>Populus deltoides</i>	eastern cottonwood	sapling, shrub, herb	FAC+	2
<i>Potentilla norvegica</i>	rough cinquefoil	herb	FAC	0
<i>Robinia pseudoacacia</i>	black locust	shrub	FACU-	*
<i>Rorippa islandica</i>	marsh yellow cress	herb	OBL	4
<i>Rudbeckia laciniata</i>	cut-leaf coneflower	herb	FACW+	3
<i>Rumex altissimus</i>	pale dock	herb	FACW-	2

*Species list continued on next page.*

**ROUTINE ONSITE WETLAND DETERMINATION**  
Site 1 (page 5 of 6)

**Field Investigators:** Feist, Kurylo, and Larimore  
**Date:** 22 September and 28 October 2004 **Project Name:** FAP 310 (US 67)  
**Section No.:** 104RS-2, (104)BR, (104-1)BR, 105RS-2  
**State:** Illinois **County:** Mercer **Applicant:** IDOT District 4  
**Site Name:** Wetland creation  
**Legal Description:** NE 1/4, SW 1/4, Sec. 35, T. 15 N., R. 2 W  
**Location:** This wetland creation site is located 38.1 m (125 ft) south of the Edwards River and 15.2 m (50 ft) east of US 67.

**SPECIES LIST** *continued*

Scientific name	Common name	Stratum	Wetland indicator status	C†
<i>Rumex crispus</i>	curly dock	herb	FAC+	*
<i>Salix exigua</i>	sandbar willow	shrub	OBL	1
<i>Salix nigra</i>	black willow	tree, shrub	OBL	3
<i>Scirpus atrovirens</i>	dark green bulrush	herb	OBL	4
<i>Sicyos angulatus</i>	bur cucumber	vine	FACW-	3
<i>Solidago canadensis</i>	Canada goldenrod	herb	FACU	1
<i>Solidago gigantea</i>	late goldenrod	herb	FACW	3
<i>Teucrium canadense</i>	American germander	herb	FACW-	3
<i>Typha latifolia</i>	cattail	herb	OBL	1
<i>Urtica dioica</i>	stinging nettle	herb	FAC+	2
<i>Verbena hastata</i>	blue vervain	herb	FACW+	3
<i>Veronica peregrina</i>	purslane speedwell	herb	FACW+	0
<i>Xanthium strumarium</i>	cocklebur	herb	FAC	0

†Coefficient of Conservatism (Taft et al. 1997)

\*Non-native species

$$\bar{c} = \sum C/N = 128/64 = 2.0$$

$$FQI = \bar{c} / \sqrt{N} = 128/\sqrt{64} = 16.0$$

**PLANTED TREES**

Scientific name	Common name	Stratum	Wetland indicator status	C†
<i>Quercus palustris</i>	pin oak	tree	FACW	4
<i>Quercus bicolor</i>	swamp white oak	tree	FACW+	7
<i>Betula nigra</i>	red birch	tree	FACW	4

†Coefficient of Conservatism (Taft et al. 1997)

Non-native species

$$\bar{c} = \sum C/N = 143/67 = 2.1^{**}$$

$$FQI = \bar{c} / \sqrt{N} = 143/\sqrt{67} = 17.5^{**}$$

\*\*These calculations include the complete species list above, as well as the planted trees.

**ROUTINE ONSITE WETLAND DETERMINATION**

Site 1 (page 6 of 6)

**Field Investigators:** Feist, Kurylo, and Tessene

**Date:** 2 August 2005

**Project Name:** FAP 310 (US 67)

**Section No.:** 104RS-2, (104)BR, (104-1)BR, 105RS-2

**State:** Illinois

**County:** Mercer

**Applicant:** IDOT District 4

**Site Name:** Wetland creation

**Legal Description:** NE 1/4, SW 1/4, Sec. 35, T. 15 N., R. 2 W

**Location:** This wetland creation site is located 38.1 m (125 ft) south of the Edwards River and 15.2 m (50 ft) east of US 67.

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## **Appendix C**

### **Photographs of Wetland Mitigation Sites**



Photo-station 1. View of wetland creation (Site 1) facing northeast.



Photo-station 2. View of wetland creation (Site 1) facing north.