

# **WETLAND MITIGATION SITE MONITORING REPORT MORRIS WETLAND BANK (2008)**

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## **Introduction**

This report details the fifth year of monitoring of the Morris Wetland Bank in Grundy County, Illinois. The Morris Wetland Bank is located near Morris, Illinois and is immediately east of IL Route 47 and south of the Illinois River (Appendix 1). More information about the site can be found in the Wetland Bank Prospectus: Morris Site prepared by IDOT (Brooks 2000).

As of 17 May 2004, a total of 7630 trees had been planted on 109 acres of ground slated for wetland restoration at the Morris Wetland Bank in Grundy County, Illinois (IDOT Memo from Michael L. Hine dated 21 May 2004). These trees were planted in 11 different planned wetlands (labeled A through K in Appendix 2). The first year of monitoring was conducted on 27-28 July and 20 September 2004. INHS personnel counted all live planted trees and performed wetland determinations at each site. The second year of monitoring was conducted on 5-6 July and 27 September 2005. The third year of monitoring was conducted on 26-27 July 2006. The fourth year of monitoring was conducted on 27-28 September and 4-5 October 2007. Monitoring for 2008 was conducted on 15-16 October.

The following sources were examined while surveying the project area to determine wetland locations and boundaries: United States Geological Survey topographic maps and National Wetland Inventory (NWI) maps (Morris 7.5 minute quadrangle); *Soil Survey of Grundy County, Illinois*; aerial photographs; *National List of Plant Species that Occur in Wetlands: Illinois*; and the 1987 *Corps of Engineers Wetlands Delineation Manual*. These materials were used during an onsite evaluation of vegetation, soils, and hydrology. Results of these determinations are described in detail on the forms in Appendix 3. The boundaries of the sites determined to be wetlands were recorded using a Trimble Global Positioning System. The locations of wetland sites were overlaid on digital orthoquads (DOQs) using Arcview. A printout of this is included in Appendix 2.

This report discusses the goals, objectives, and performance criteria for the wetland bank, 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 Wetland Bank Prospectus (Brooks 2000) 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:** The goal of this wetland restoration project is to create one continuous tract of floodplain forest within the Morris Mitigation Bank. To this effect, 109 acres of wetland restoration area have been planted with native trees and shrubs in 11 different planned wetlands (A-K). Objectives and performance criteria for these planned wetlands follow.

**Objective 1:** Each planned wetland should be jurisdictional wetland as defined by current federal standards.

**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 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.

**Objective 2:** Each planned wetland should meet standards for floristic composition and vegetation cover.

**Performance criteria:**

- a. Establishment of planted trees and shrubs: At least 80% of the planted trees and shrubs should be established and living.
- b. Native species composition: At least 90% of the plants present should be non-weedy, native species.
- c. Dominance of vegetation: None of the three most dominant plant species in any layer at any site should be non-native or weedy species, such as cattails (*Typha* spp.), sandbar willow (*Salix exigua*), or reed canary grass (*Phalaris arundinacea*).

## Methods

### Objective 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

Wetland hydrology was monitored by personnel from the Illinois State Geological Survey (ISGS). 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 soils and vegetation parameters in the Corps of Engineers Wetland Delineation Manual are also 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 the 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 40 monitoring wells and 9 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 two on-site dataloggers and one off-site stream gauging station. The dataloggers measure surface-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, 2007 to September 1, 2008 (Fucciolo et al. 2008).

Twenty-five Indicator of Reduction in Soils (IRIS) tubes were also installed in four of the planned wetland areas (B, C-1, H-1 and K-1) (Matthews 2008). These tubes measure reducing conditions in the soil; reduced soil conditions are indicative of hydric soils and wetland hydrology. IRIS tubes were installed on September 26, 2006 and were removed on May 15, 2007.

#### 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.

## **Objective 2**

### **a. Establishment of planted trees and shrubs**

In order to help create and restore floodplain forest, trees and shrubs were planted at each planned wetland site. According to a memo from Michael L. Hine (Engineer, IDOT Design and Environment) to John Betker (Project Manager, U.S. Army Corp of Engineers, Rock Island District) dated 21 May 2004, the following numbers of trees and shrubs (Table 1) were planted at the planned wetland sites (A-K) on May 17 2004. In September 2004, 1093 additional trees were planted in order to replace trees that did not survive the initial planting (Matthew Sunderland, IDOT Project Manager, personal communication). Since 2004 additional trees have been planted at the site in 2005 (750 trees) and 2008 (580 trees) to replace trees that died during the previous years as indicated by the annual census. Survivorship of planted trees is determined each year by censusing. All live planted trees are counted. Survival is calculated as a percentage of the number of expected live individuals:  $(\text{Total number of live planted trees} / \text{number of known planted trees}) \times 100$ .

### **b. Native species composition**

Complete species lists were made for each site in the first three monitoring years; however, due to the continued low quality of the plant communities present, only the sites with wetland area present (A, C, H, and K) had full species lists generated in 2007 and 2008. These can be found in the wetland delineation forms in Appendix 3. A combined species list for all other sites (B, D, E, F, G, I, and J) can be found in Appendix 5. Non-native species are identified with an asterisk. The percent native species was calculated as the number of native species divided by the total number of species.

### **c. Dominance of vegetation**

Plant species dominance was determined as in Objective 1a. 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, a photograph was taken of each planned wetland site in order to document changes in plant community size and composition (Appendix 6).

**Table 1.** Number of trees and shrubs by species planted per site at the Morris Wetland Mitigation Bank, May 2004.

	<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>	<b>F</b>	<b>G</b>	<b>H</b>	<b>I</b>	<b>J</b>	<b>K</b>	<b>Totals</b>
Pin Oak	22	3	148	4	19	10	7	76	19	9	116	<b>433</b>
Bur Oak	50	6	339	10	39	20	17	180	55	26	258	<b>1000</b>
Butternut	8	2	46	3	6	4	3	30	8	3	43	<b>156</b>
Black Walnut	51	8	339	10	39	20	17	180	55	26	258	<b>1003</b>
Roughleaf Dogwood	3	1	19	1	2	1	1	7	2	1	26	<b>64</b>
American Hazlenut	5	1	36	1	5	1	1	22	7	3	18	<b>100</b>
Nannyberry	15	1	100	1	11	5	5	52	16	7	74	<b>287</b>
Shumards Oak	25	2	170	5	20	10	9	90	29	10	130	<b>500</b>
White Ash	10	1	67	2	7	4	2	38	11	6	52	<b>200</b>
Overcup Oak	10	1	67	2	7	3	3	38	10	5	54	<b>200</b>
Paw Paw	59	6	396	0	45	24	19	210	64	28	304	<b>1155</b>
Sycamore	59	6	396	11	46	26	20	210	64	27	304	<b>1169</b>
Swamp White Oak	58	7	395	11	46	23	19	211	64	27	304	<b>1165</b>
Indigo Bush	2	1	11	1	2	1	1	7	2	1	11	<b>40</b>
Gray Dogwood	8	1	56	1	6	4	2	30	9	4	42	<b>163</b>

## Results

### Project goal 1

#### a. Predominance of hydrophytic vegetation

Dominant plant species for the planned wetland sites which met the wetland requirements in 2008 are listed on the wetland forms in Appendix 3. Portions of sites A, C, H, and K had dominant hydrophytic vegetation in 2008. These are labeled A-1, C-1, H-1, and K-1 in the wetland delineation forms (Appendix 3) and on the figure in Appendix 2.

#### b. Presence of wetland hydrology

The figure in Appendix 4 shows the areal extent of wetland hydrology at the Morris Mitigation Bank in 2008. ISGS personnel (Fucciolo et al. 2008) found that the total area that satisfied the wetland hydrology criterion of the 1987 U.S. Army Corps of Engineers Wetland Delineation Manual for greater than 5% of the growing season was 15.6 ha (38.5 ac); further, 6.3 ha (15.6 ac) satisfied the hydrology criterion for greater than 12.5% of the growing season. These acreages are for the entire mitigation site. Within the planned wetlands a total of 6.11 ha (15.1 ac) satisfied the wetland hydrology criterion, 6.03 ha (14.9 ac) within Site K-1 and 0.08 ha (0.20 ac) within Site A-1. In addition to these areas of wetland hydrology identified by the ISGS, field evidence suggests that two small areas of wetland hydrology are present within the lowest parts of sites C and H. These areas are designated as Site C-1 and Site H-1 on the figure in Appendix 2. C-1 is 0.33 ha (0.82 ac) in size while Site H-1 encompasses 0.26 ha (0.63 ac). Additional details regarding site hydrology in 2008 are summarized in ISGS' Annual Report for Active IDOT Wetland Compensation and Hydrologic Monitoring Sites, September 1, 2007 to September 1, 2008 (Fucciolo et al. 2008).

In 2007, results from IRIS tubes indicated the presence of reduced soil conditions present at sites C-1, H-1, and K-1. These results are indicative of the presence of hydric soils and wetland hydrology.

#### c. Occurrence of hydric soils

Hydric soils occur over at least a portion of each planned wetland. Many of the 11 sites have very similar hydric soil areas. There are minor differences in horizon thicknesses, and also minor variation in colors of redoximorphic features. Because these differences are minor and do not in any way change the hydric status of these soils, descriptions of typical, representative pedons located in these areas are included in Tables 2 and 3. Table 2 is a soil description of a typical pedon of hydric soil located within sites A and B. Table 3 is a soil description of a typical pedon of hydric soil located within areas C, D, E, F, G, H, I, J, and K.

**Table 2.** Description of the soils at planned wetlands A and B.

Depth	Matrix Color	Redox Concentrations	Redox Depletions	Texture	Structure
0-15 cm	10YR 2.5/1	None	None	Silt loam	Granular
15-66 cm+	10YR 2.5/1	10YR 4/3	None	Silt loam	Subangular blocky

**Table 3.** Description of the soils at planned wetlands C, D, E, F, G, H, I, J, and K.

Depth	Matrix Color	Redox Concentrations	Redox Depletions	Texture	Structure
0-33 cm	10YR 3/1	10YR 4/3	None	Silt loam	Granular
33-66+ cm	10YR 3/1	10YR 4/3 (also some 10YR 4/4 in some)	None	Silt loam	Subangular blocky

The hydric soil types present at these sites were in all cases of larger extent than was the area containing hydrophytic vegetation. We did not concern ourselves with mapping the exact extent of hydric soil area, as we were more concerned with determining whether sites were jurisdictional wetlands or not. More extensive soil mapping could be undertaken to map out the exact acreage of hydric soil, but did not seem like a valuable exercise when confronted with the small areas which possessed hydrophytic vegetation and wetland hydrology. In all cases, the areas possessing hydrophytic vegetation and wetland hydrology were underlain by hydric soil. The ISGS data collected over the past nine years makes it clear that the hydrologic regime under which much of the hydric soil at this site developed is no longer present (i.e. the hydric soils are relict features). Presence of hydric soil is not the limiting factor of the jurisdictional status for any of these sites. More information on the soils at sites A, C, H, and K can be found in the wetland delineation forms in Appendix 3.

#### Jurisdictional Wetland Acreages

The portions of the planned wetland sites that had wetland vegetation, soils, and hydrology in 2008 are referred to as A-1, C-1, H-1, and K-1 on the site map (Appendix 2) and in the wetland delineation forms (Appendix 3). Total wetland acreage within the planned wetlands was 6.70 ha (16.55 ac) for 2008 (Table 4). Although this was slightly less than in 2007, it is substantially more than in previous years (2004-2006). The ISGS identified areas within sites A and K that satisfied the wetland hydrology criterion. These areas also had dominant hydrophytic vegetation and hydric soils and are, therefore, wetlands. In addition, two small areas within sites C and H are wetlands, even though they were not identified as such by the ISGS. These areas were without wells, but had dominant hydrophytic vegetation and hydric soils, and occupied low positions in the landscape relative to the surrounding ground.

**Table 4.** Amount of wetland acreage per site at the Morris Wetland Mitigation Bank.

Site	2004		2005		2006		2007		2008	
	Acres	Hectares								
<b>A-1</b>	1.39	0.56	0.00	0.00	0.00	0.00	0.00	0.00	0.20	0.08
<b>B-1</b>	0.49	0.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>C-1</b>	0.82	0.33	0.82	0.33	0.82	0.33	0.82	0.33	0.82	0.33
<b>H-1</b>	0.63	0.26	0.63	0.26	0.63	0.26	0.63	0.26	0.63	0.26
<b>K-1</b>	4.19	1.70	4.19	1.70	2.57	1.04	16.13	6.53	14.90	6.03
<b>Total</b>	7.52	3.05	5.64	2.29	4.02	1.63	17.58	7.12	16.55	6.70

#### **Project goal 2**

##### a. Establishment of planted trees and shrubs

Table 5 shows the results of the censusing of trees at sites A-K in 2008. Table 6 shows the percent survival. Overall, tree survival was 63.4%, down significantly from the 73.7% reported from 2007 (Wilm et al. 2007) and the 84.5% reported from 2006 (Feist et

al. 2006). This figure is also well below the required 80% survival rate for tree and shrub species. Percent survival by site and by species is shown in bold in Table 6. Tree survival was less than 80% at ten sites (A, D, E, F, G, H, I, J, and K). Nine tree or shrub species had less than 80% survival. Because young oaks and dogwoods can be difficult to identify, oaks and dogwoods were grouped for the survivorship calculation in Table 7. When grouped, the dogwoods combined showed a survivorship of 86.3% and the oaks combined showed a survivorship of 76.6%. Other species with less than 80% survival were butternut, black walnut, hazelnut, nannyberry, white ash, and paw paw.

Although no pecan trees (*Carya illinoensis*) were reported to be planted at the site, 146 young planted pecan trees were counted at the site; down from 266 counted in 2006 (Feist et al. 2006) and 218 counted in 2007 (Wilm et al. 2007). These trees are included in our totals.

b. Native species composition

Percent native species have been calculated from the species lists on the wetland delineation forms in Appendix 3 and from the comprehensive species list of non-wetland areas in Appendix 5. These percentages are given in Table 8 below along with results from 2007; results from 2004-2006 are shown in Table 9. None of the planned wetland areas met the performance criterion requirement of 90% native species. All values were substantially lower than this. For the first time since monitoring of the site began however, mowing in the planned wetland areas has been substantially decreased. If this continues for several years, the number of non-weedy and exocytic species at the site may decrease as perennial, native, non-weedy species become established.

c. Dominance of vegetation

The three most dominant species for each site are listed in Table 10. Non-native species are in bold type and are marked with an asterisk (\*); native but weedy species are in bold type. Dominant vegetation for sites A, C, H, and K is also listed on the wetland forms in Appendix 3. These were the only sites that had hydrophytic vegetation dominant over at least a part of the site. There were no sites that did not have non-native or weedy species among the three most dominant species (Table 10). Therefore none of the sites meet this performance criterion. On a positive note, there were no sites dominated by *Cirsium arvense* (Canada thistle) in 2008. In 2007, four sites had been dominated by this noxious weed.

Photographs of sites A-K are included in Appendix 6 of this report.

**Table 5.** Number of live trees counted by INHS personnel at sites A-K at the Morris Wetland Mitigation Bank in 2008.

	<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>	<b>F</b>	<b>G</b>	<b>H</b>	<b>I</b>	<b>J</b>	<b>K</b>	<b>Totals</b>
Pin Oak	24	3	207	6	6	3	2	18	4	3	36	<b>312</b>
Bur Oak	52	14	416	3	15	4	5	157	23	8	323	<b>1020</b>
Butternut	2	0	4	0	0	0	0	0	1	0	0	<b>7</b>
Black Walnut	11	3	100	3	0	0	2	8	17	12	37	<b>193</b>
Roughleaf Dogwood	16	4	27	0	1	1	2	34	7	1	51	<b>144</b>
American Hazlenut	0	0	9	1	5	0	1	12	0	0	7	<b>35</b>
Nannyberry	25	0	37	1	4	5	0	28	10	6	43	<b>159</b>
Shumards Oak	0	0	29	0	5	0	0	8	7	0	26	<b>75</b>
White Ash	5	0	27	1	0	1	6	9	3	1	26	<b>79</b>
Overcup Oak	8	1	115	1	7	2	2	5	14	2	21	<b>178</b>
Paw Paw	20	0	120	0	21	4	8	112	50	12	49	<b>396</b>
Sycamore	43	11	371	6	20	3	20	183	67	15	250	<b>989</b>
Swamp White Oak	77	14	519	5	5	6	4	80	78	23	131	<b>942</b>
Indigo Bush	8	2	53	3	3	0	1	5	5	4	33	<b>117</b>
Gray Dogwood	0	0	25	1	4	0	4	6	2	0	10	<b>52</b>
Pecan	14	2	98	1	0	4	6	1	0	0	20	<b>146</b>
<b>Totals</b>	<b>305</b>	<b>54</b>	<b>2157</b>	<b>32</b>	<b>96</b>	<b>33</b>	<b>63</b>	<b>666</b>	<b>288</b>	<b>87</b>	<b>1063</b>	<b>4844</b>

**Table 6.** Percent survival at sites A-K at the Morris Wetland Bank in 2008.

	<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>	<b>F</b>	<b>G</b>	<b>H</b>	<b>I</b>	<b>J</b>	<b>K</b>	<b>Totals</b>
Pin Oak	109.1	100.0	139.9	150.0	31.6	30.0	28.6	23.7	21.1	33.3	31.0	<b>72.1</b>
Bur Oak	104.0	233.3	122.7	30.0	38.5	20.0	29.4	87.2	41.8	30.8	125.2	<b>102.0</b>
Butternut	25.0	0.0	8.7	0.0	0.0	0.0	0.0	0.0	12.5	0.0	0.0	<b>4.5</b>
Black Walnut	21.6	37.5	29.5	30.0	0.0	0.0	11.8	4.4	30.9	46.2	14.3	<b>19.2</b>
Roughleaf Dogwood	533.3	400.0	142.1	0.0	50.0	100.0	200.0	485.7	350.0	100.0	196.2	<b>225.0</b>
American Hazlenut	0.0	0.0	25.0	100.0	100.0	0.0	100.0	54.5	0.0	0.0	38.9	<b>35.0</b>
Nannyberry	166.7	0.0	37.0	100.0	36.4	100.0	0.0	53.8	62.5	85.7	58.1	<b>55.4</b>
Shumards Oak	0.0	0.0	17.1	0.0	25.0	0.0	0.0	8.9	24.1	0.0	20.0	<b>15.0</b>
White Ash	50.0	0.0	40.3	50.0	0.0	25.0	300.0	23.7	27.3	16.7	50.0	<b>39.5</b>
Overcup Oak	80.0	100.0	171.6	50.0	100.0	66.7	66.7	13.2	140.0	40.0	38.9	<b>89.0</b>
Paw Paw	33.9	0.0	30.3	NA	46.7	16.7	42.1	53.3	78.1	42.9	16.1	<b>34.3</b>
Sycamore	72.9	183.3	93.7	54.5	43.5	11.5	100.0	87.1	104.7	55.6	82.2	<b>84.6</b>
Swamp White Oak	132.8	200.0	131.4	45.5	10.9	26.1	21.1	37.9	121.9	85.2	43.1	<b>80.9</b>
Indigo Bush	400.0	200.0	481.8	300.0	150.0	0.0	100.0	71.4	250.0	400.0	300.0	<b>292.5</b>
Gray Dogwood	0.0	0.0	44.6	100.0	66.7	0.0	200.0	20.0	22.2	0.0	23.8	<b>31.9</b>
Pecan	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<b>NA</b>
<b>Totals</b>	<b>79.2</b>	<b>114.9</b>	<b>83.4</b>	<b>50.8</b>	<b>32.0</b>	<b>21.2</b>	<b>50.0</b>	<b>48.2</b>	<b>69.4</b>	<b>47.5</b>	<b>53.3</b>	<b>63.4</b>

**Table 7.** Percent survival of oaks and dogwoods at the Morris Wetland Bank in 2008..

	A	B	C	D	E	F	G	H	I	J	K	Totals
Oaks combined	97.58	168.42	114.92	46.88	29.01	22.73	23.64	45.04	71.19	46.75	62.30	<b>76.6</b>
Dogwoods combined	145.5	200.0	69.3	50.0	62.5	20.0	200.0	108.1	81.8	20.0	89.7	<b>86.3</b>

**Table 8.** Percent native species at the Morris Wetland Bank, 2007-2008.

Sites	A	C	H	K	B, D, E, F, G, I, J, K Combined
Percent native species 2007	NA	58.5	55.8	62.2	58.6
Percent native species 2008	64.1	61.5	58.8	64.6	60

**Table 9.** Percent native species at the Morris Wetland Bank, 2004-2006.

Site	A	B	C	D	E	F	G	H	I	J	K
Percent native species 2004	70.2	70.0	69.0	61.8	70.9	76.7	63.6	60.6	63.5	65.4	65.5
Percent native species 2005	69.3	53.1	55.4	55.2	52.2	54.6	48.3	62.5	59.6	58.6	62.8
Percent native species 2006	61.5	50.0	60.2	53.5	60.7	54.2	49.3	58.6	55.0	58.0	64.3

**Table 10.** Three most dominant species by layer in order of dominance at sites A-K at the Morris Wetland Mitigation Bank in 2008.

Site	Three most dominant species
A-1	<i>Elymus virginicus</i> , <i>Aster simplex</i> , <i>Poa pratensis</i> *
A-2	<i>Elymus virginicus</i> , <i>Aster pilosus</i> , <i>Poa pratensis</i> *
B-1	<i>Elymus virginicus</i> , <i>Poa pratensis</i> *, <i>Aster pilosus</i>
B-2	<i>Elymus virginicus</i> , <i>Poa pratensis</i> *, <i>Aster pilosus</i>
C-1	<i>Elymus virginicus</i> , <i>Phalaris arundinacea</i> *, <i>Ambrosia trifida</i>
C-2	<i>Elymus virginicus</i> , <i>Poa pratensis</i> *, <i>Aster pilosus</i>
D	<i>Elymus virginicus</i> , <i>Setaria faberi</i> *, <i>Phalaris arundinacea</i> *
E	<i>Elymus virginicus</i> , <i>Setaria faberi</i> *, <i>Setaria glauca</i> *
F	<i>Elymus virginicus</i> , <i>Poa pratensis</i> *, <i>Bromus japonicus</i> *
G	<i>Elymus virginicus</i> , <i>Poa pratensis</i> *, <i>Setaria glauca</i> *
H-1	<i>Populus deltoides</i> (sh), <i>Phalaris arundinacea</i> *, <i>Elymus virginicus</i> , <i>Aster simplex</i>
H-2	<i>Elymus virginicus</i> , <i>Poa pratensis</i> *, <i>Phalaris arundinacea</i> *
I	<i>Elymus virginicus</i> , <i>Aster simplex</i> , <i>Conyza canadensis</i>
J	<i>Elymus virginicus</i> , <i>Conyza canadensis</i> , <i>Daucus carota</i> *
K-1	<i>Elymus virginicus</i> , <i>Setaria faberi</i> *, <i>Setaria glauca</i> *
K-2	<i>Elymus virginicus</i> , <i>Setaria faberi</i> *, <i>Poa pratensis</i> *

## Discussion

Wetland delineation forms for sites A, C, H, and K are included in Appendix 3. Only sites A-1, C-1, H-1, and K-1 met the three criteria for a wetland in 2008. Out of the 33.22 ha (109.0 acres) of planned wetland at the Morris Mitigation Bank, only 6.70 ha (16.55 acres) presently qualify as jurisdictional wetland. This is slightly down from 2007 (7.12 ha [17.58 acres]) but up significantly from previous years (Table 4). Hydrology at this site has been monitored by the ISGS for nine years now; therefore it seems unlikely that the amount of jurisdictional wetland at the site will increase substantially in the near future without significant alterations to hydrology.

Tree survival at all sites combined was 63.4% of the original 7635 planted trees (Table 6), down significantly from the 73.7% reported from 2007 (Wilm et al. 2007) and well below the required 80% survival rate. Therefore, it is recommended that additional replacement trees be planted at the site if the 80% tree survival rate is to be met. During the tree censusing it was noted that a significant number of the wire beaver guards surrounding the trees had been bent or dislodged by mowers or flooding. Bent or leaning beaver guards are a serious impediment to the growth and survival of these young trees. It is recommended that beaver guards be checked periodically for damage. Also, of note was damage to trees from deer browsing. Many trees, in particular the dogwoods, were significantly browsed, often with no growth at all outside of the caged beaver guards.

Planned wetland sites do not meet the requirement of 90% native species (Table 8). All sites are well below the requirement and have been for all monitoring years (Table 8, Table 9). Extensive mowing of the site has delayed the establishment of perennial native non-weedy species at the site. Now that mowing has been decreased at the site, more perennial native non-weedy species should become established at the site, but this could take several years.

There were no sites that did not have non-native or weedy species among the three most dominant species (Table 10). On a positive note, there were no sites dominated by *Cirsium arvense* (Canada thistle) in 2008. In 2007, four sites had been dominated by this noxious weed. However, reed canary grass (*Phalaris arundinacea*), an aggressive, invasive exotic, is dominant in three planned wetland sites. This is up from two sites in 2007 (Wilm et al. 2007). If left unchecked, reed canary grass can rapidly spread, excluding other species to the point of forming a virtual monoculture. Its control should be addressed.

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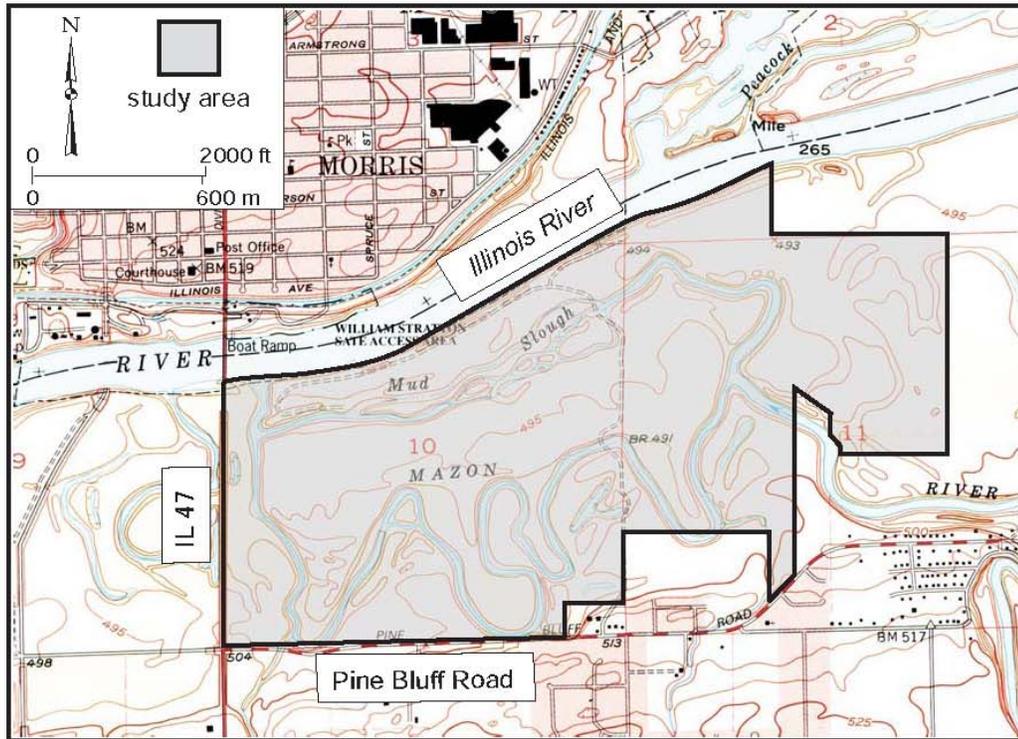
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## **APPENDIX 1**

### **Location of the Morris Mitigation Bank**

### Morris, Illinois River Wetland Bank Site General Study Area and Vicinity

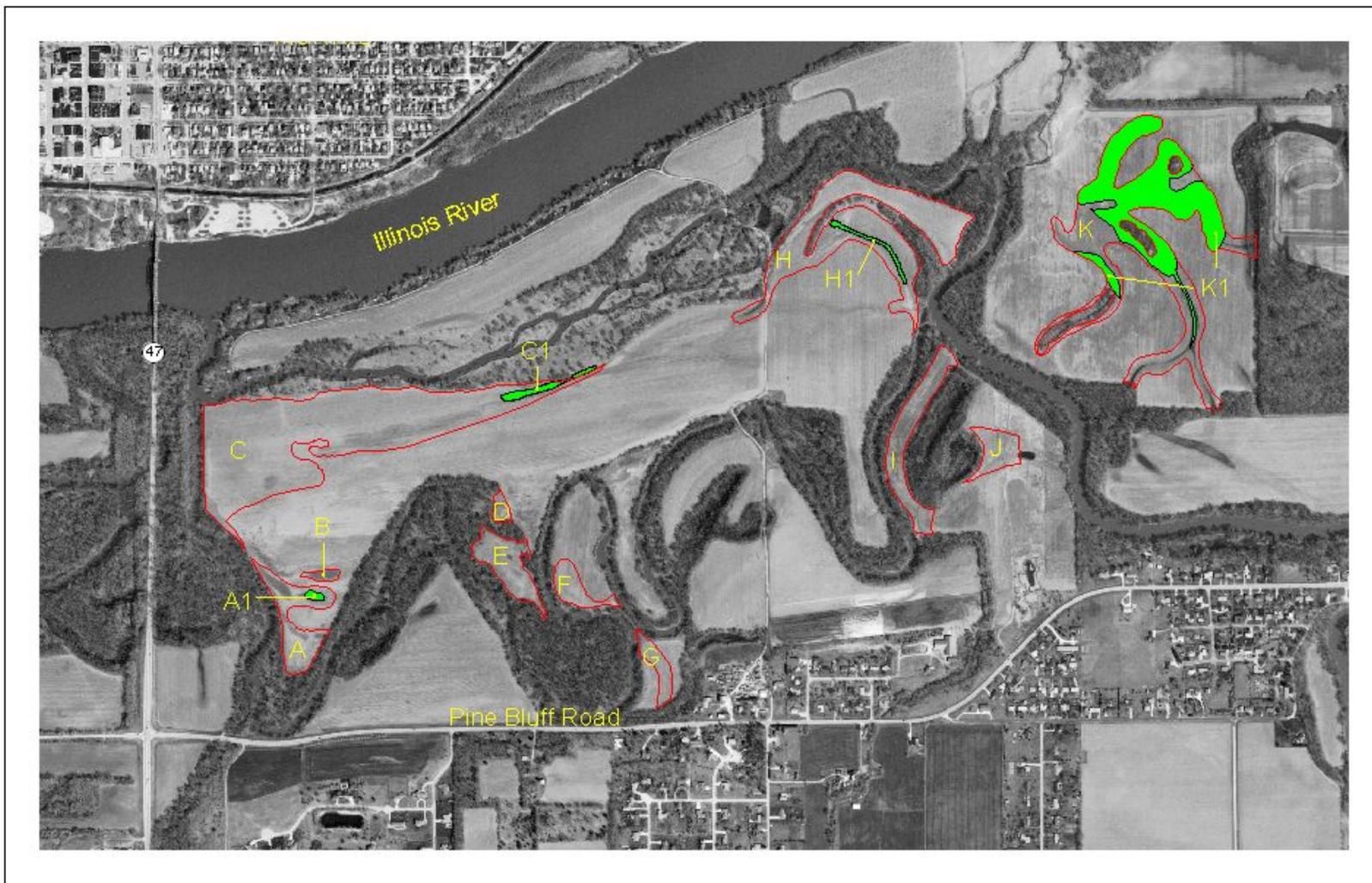
from the USGS Topographic Series, Morris, IL 7.5-minute Quadrangle (USGS 1993)  
contour interval is 5 feet



## **APPENDIX 2**

### **Locations of Planned Wetlands**

### Morris Mitigation Bank Site Grundy County, 2008



Wetland restoration sites  
Wetland sites in 2008

0 1200 2400 Feet

0 500 Meters

scale 1:14,400  
1 inch=1200 ft



01/09

**APPENDIX 3**

**Wetland Determination Forms**

**ROUTINE ONSITE WETLAND DETERMINATION**

Site A (page 1 of 4)

**Field Investigator:** Feist and Wiesbrook      **Date:** 15-16 October 2008  
**Project Name:** Morris Wetland Bank  
**Job No.:** P-93-010-98      **Seq. No.:** 1306  
**State:** Illinois      **County:** Grundy      **Applicant:** IDOT District 3  
**Site Name:** Planned wetland  
**Legal Description:** S/2, SW/4 Sect. 10, T. 33 N., R. 7 E.  
**Location:** This planned wetland is approximately 335 m (1100 ft) east of Illinois 47 and just north of the Mazon River.

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

**VEGETATION (A-1)**

<b>Dominant Plant Species</b>	<b>Indicator Status</b>	<b>Stratum</b>
1. <i>Aster simplex</i>	FACW	herb
2. <i>Elymus virginicus</i>	FACW-	herb
3. <i>Poa pratensis</i>	FAC-	herb
4. <i>Setaria faberi</i>	FACU+	herb
5. <i>Setaria glauca</i>	FAC	herb

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

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

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

**SOILS (A-1)**

Series and phase: Sawmill silty clay loam (Cumulic Endoaquoll)

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 4/3  
 Redox Depletions?      Yes:      No: X    Color: N/A

Matrix color: 10YR 2.5/1

Other indicators: None

**Hydric soils?** Yes: X      No:

**Rationale:** The Natural Resources Conservation Service identifies Sawmill as a Cumulic Endoaquoll which is poorly drained. The presence of redox concentrations 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 criteria. This soil meets NRCS hydric soil indicator F6 – Redox dark surface.

## ROUTINE ONSITE WETLAND DETERMINATION

Site A (page 2 of 4)

**Field Investigator:** Feist and Wiesbrook      **Date:** 15-16 October 2008  
**Project Name:** Morris Wetland Bank  
**Job No.:** P-93-010-98      **Seq. No.:** 1306  
**State:** Illinois      **County:** Grundy      **Applicant:** IDOT District 3  
**Site Name:** Planned wetland  
**Legal Description:** S/2, SW/4 Sect. 10, T. 33 N., R. 7 E.  
**Location:** This planned wetland is approximately 335 m (1100 ft) east of Illinois 47 and just north of the Mazon River.

### HYDROLOGY (A-1)

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

Depth to saturated soil: Undetermined

Overview of hydrological flow through the system: This site occupies a small depression within the landscape. It receives water via precipitation and runoff from surrounding higher ground and occasional overflow from the Illinois and Mazon rivers. Water leaves the site primarily via evapotranspiration and soil infiltration.

Size of Watershed: Approximately 14023 km<sup>2</sup> (8714 mi<sup>2</sup>)

Other field evidence observed: This site is lower in elevation than surrounding ground.

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

**Rationale:** In addition to the field evidence cited above, ISGS soil-zone well #51 which is located within this site satisfied the wetland hydrology criterion (Fucciolo et al. 2008).

### DETERMINATION AND RATIONALE (A-1)

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

**Rationale:** Dominant hydrophytic vegetation, hydric soils, and wetland hydrology are present throughout this site. Therefore, we determined that this site is a wetland. The NWI did not identify this site as a wetland.



**ROUTINE ONSITE WETLAND DETERMINATION**

Site A (page 4 of 4)

**Field Investigator:** Feist and Wiesbrook     **Date:** 15-16 October 2008  
**Project Name:** Morris Wetland Bank  
**Job No.:** P-93-010-98     **Seq. No.:** 1306  
**State:** Illinois     **County:** Grundy     **Applicant:** IDOT District 3  
**Site Name:** Planned wetland  
**Legal Description:** S/2, SW/4 Sect. 10, T. 33 N., R. 7 E.  
**Location:** This planned wetland is approximately 335 m (1100 ft) east of Illinois 47 and just north of the Mazon River.

**HYDROLOGY (A-2)**

Inundated: Yes:     No: X     Depth of standing water: NA  
Depth to saturated soil: Undetermined  
Overview of hydrological flow through the system: It receives water via precipitation and occasional overflow from the Illinois and Mazon rivers. Water leaves the site primarily via evapotranspiration.  
Size of Watershed: Approximately 14023 km<sup>2</sup> (8714 mi<sup>2</sup>)  
Other field evidence observed: None.

**Wetland hydrology:** Yes:     No: X  
**Rationale:** No evidence of wetland hydrology was found at this site. The ISGS reported that the wetland hydrology criterion had not been met for this site in 2008 (Fucciolo et al. 2008).

**DETERMINATION AND RATIONALE (A-2)**

**Is the site a wetland?** Yes:     No: X  
**Rationale:** Dominant hydrophytic vegetation, hydric soils, and wetland hydrology are all absent; therefore, this site is not a wetland. The NWI coded this entire site as upland (U).

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**ROUTINE ONSITE WETLAND DETERMINATION**

Site A (page 4 of 4)

**Field Investigator:** Feist and Wiesbrook     **Date:** 15-16 October 2008  
**Project Name:** Morris Wetland Bank  
**Job No.:** P-93-010-98     **Seq. No.:** 1306  
**State:** Illinois     **County:** Grundy     **Applicant:** IDOT District 3  
**Site Name:** Planned wetland  
**Legal Description:** S/2, SW/4 Sect. 10, T. 33 N., R. 7 E.  
**Location:** This planned wetland is approximately 335 m (1100 ft) east of Illinois 47 and just north of the Mazon River.

**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, herb	FACW-	1
<i>Acer saccharinum</i>	silver maple	shrub, herb	FACW	1
<i>Agrostis alba</i>	redtop	herb	FACW	0
<i>Amaranthus tuberculatus</i>	tall waterhemp	herb	OBL	1
<i>Ambrosia trifida</i>	giant ragweed	herb	FAC+	0
<i>Apocynum cannabinum</i>	dogbane	herb	FAC	2
<i>Asclepias syriaca</i>	common milkweed	herb	UPL	0
<i>Aster pilosus</i>	hairy aster	herb	FACU+	0
<i>Aster simplex</i>	panicked aster	herb	FACW	3
<i>Bidens frondosa</i>	common beggar-ticks	herb	FACW	1
<i>Bromus inermis</i>	smooth brome	herb	UPL	*
<i>Bromus japonicus</i>	Japanese brome	herb	FACU	*
<i>Chaerophyllum procumbens</i>	wild chervil	herb	FAC+	1
<i>Cirsium arvense</i>	Canada thistle	herb	FACU	*
<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 strigosus</i>	straw colored flatsedge	herb	FACW	0
<i>Dactylis glomerata</i>	orchard grass	herb	FACU	*
<i>Daucus carota</i>	Queen-Anne's-lace	herb	UPL	*
<i>Digitaria ischaemum</i>	smooth crab grass	herb	FACU	*
<i>Elymus virginicus</i>	Virginia wild rye	herb	FACW-	4
<i>Erigeron strigosus</i>	daisy fleabane	herb	FAC-	2
<i>Festuca pratensis</i>	meadow fescue	herb	FACU-	*
<i>Geum canadense</i>	white avens	herb	FAC	2
<i>Hordeum jubatum</i>	squirrel-tail	herb	FAC+	*
<i>Ipomoea lacunosa</i>	small white morning-glory	herb	FACW	1
<i>Juglans nigra</i>	black walnut	herb	FACU	4
<i>Lycopus americanus</i>	common water horehound	herb	OBL	3
<i>Lactuca saligna</i>	willow lettuce	herb	FACU	*
<i>Lactuca serriola</i>	prickly lettuce	herb	FAC	*
<i>Lepidium virginicum</i>	common pepper-cress	herb	FACU-	0

*Species list continued on next page.*

**ROUTINE ONSITE WETLAND DETERMINATION**

Site A (page 4 of 4)

**Field Investigator:** Feist and Wiesbrook    **Date:** 15-16 October 2008  
**Project Name:** Morris Wetland Bank  
**Job No.:** P-93-010-98    **Seq. No.:** 1306  
**State:** Illinois    **County:** Grundy    **Applicant:** IDOT District 3  
**Site Name:** Planned wetland  
**Legal Description:** S/2, SW/4 Sect. 10, T. 33 N., R. 7 E.  
**Location:** This planned wetland is approximately 335 m (1100 ft) east of Illinois 47 and just north of the Mazon River.

**SPECIES LIST** *continued*

Scientific name	Common name	Stratum	Wetland indicator status	C†
<i>Lysimachia nummularia</i>	moneywort	herb	FACW+	*
<i>Morus alba</i>	white mulberry	herb	FAC	*
<i>Oxalis dillenii</i>	yellow wood sorrel	herb	FACU	0
<i>Panicum dichotomiflorum</i>	fall panicum	herb	FACW-	0
<i>Parthenocissus quinquefolia</i>	Virginia creeper	woody vine	FAC-	2
<i>Phalaris arundinacea</i>	reed canary grass	herb	FACW+	*
<i>Phyla lanceolata</i>	fog-fruit	herb	OBL	1
<i>Physalis subglabrata</i>	smooth ground cherry	herb	UPL	0
<i>Plantago rugelii</i>	red-stalked plantain	herb	FAC	0
<i>Poa pratensis</i>	Kentucky bluegrass	herb	FAC-	*
<i>Polygonum aviculare</i>	knotweed	herb	FAC-	*
<i>Polygonum lapathifolium</i>	curttop lady's thumb	herb	FACW+	0
<i>Polygonum pensylvanicum</i>	giant smartweed	herb	FACW+	1
<i>Populus deltoides</i>	eastern cottonwood	shrub, herb	FAC+	2
<i>Potentilla simplex</i>	common cinquefoil	herb	FACU-	3
<i>Quercus bicolor</i>	swamp white oak	herb	FACW+	7
<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
<i>Rumex crispus</i>	curly dock	herb	FAC+	*
<i>Setaria faberi</i>	giant foxtail	herb	FACU+	*
<i>Setaria glauca</i>	pigeon grass	herb	FAC	*
<i>Sida spinosa</i>	prickly sida	herb	FACU	*
<i>Smilax hispida</i>	bristly greenbrier	herb	FAC	3
<i>Solidago canadensis</i>	Canada goldenrod	herb	FACU	1
<i>Taraxacum officinale</i>	dandelion	herb	FACU	*
<i>Toxicodendron radicans</i>	poison ivy	woody vine	FAC+	1
<i>Ulmus americana</i>	American elm	herb	FACW-	5
<i>Ulmus pumila</i>	Siberian elm	herb	UPL	*
<i>Urtica dioica</i>	stinging nettle	herb	FAC+	2
<i>Vitis riparia</i>	riverbank grape	woody vine	FACW-	2

†Coefficient of Conservatism (Taft et al. 1997)

\*Non-native species

Percent native species = (41/64) \* 100 = 64.1%

 $\bar{c} = \sum C/N = 66/41 = 1.6$  $FQI = \bar{c} / \sqrt{N} = 66 / \sqrt{41} = 10.3$

**ROUTINE ONSITE WETLAND DETERMINATION**

Site A (page 4 of 4)

**Field Investigator:** Feist and Wiesbrook      **Date:** 15-16 October 2008

**Project Name:** Morris Wetland Bank

**Job No.:** P-93-010-98      **Seq. No.:** 1306

**State:** Illinois      **County:** Grundy      **Applicant:** IDOT District 3

**Site Name:** Planned wetland

**Legal Description:** S/2, SW/4 Sect. 10, T. 33 N., R. 7 E.

**Location:** This planned wetland is approximately 335 m (1100 ft) east of Illinois 47 and just north of the Mazon River.

Determined by: Mary Ann Feist (vegetation and hydrology)  
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**ROUTINE ONSITE WETLAND DETERMINATION**

Site C (page 2 of 9)

**Field Investigator:** Feist and Wiesbrook     **Date:** 15-16 October 2008  
**Project Name:** Morris Wetland Bank  
**Job No.:** P-93-010-98     **Seq. No.:** 1306  
**State:** Illinois     **County:** Grundy     **Applicant:** IDOT District 3  
**Site Name:** Planned wetland  
**Legal Description:** SW/4 Sect. 10, T. 33 N., R. 7 E.  
**Location:** This planned wetland stretches from 122 m (400 ft) to 1265 m (4150 ft) east of Illinois 47 and is between 244 m (800 ft) to 1006 m (3300 ft) north of Pine Bluff Rd.

**HYDROLOGY (C-1)**

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

Depth to saturated soil: Undetermined

Overview of hydrological flow through the system: This site occupies a narrow depression within the landscape. It receives water via precipitation and runoff from surrounding higher ground and occasional overflow from the Illinois and Mazon rivers. Water leaves the site primarily via evapotranspiration and soil infiltration.

Size of Watershed: Approximately 14023 km<sup>2</sup> (8714 mi<sup>2</sup>)

Other field evidence observed: This site is lower in elevation than surrounding ground. Surface scouring was also observed.

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

**Rationale:** Although, the ISGS did not report that the wetland hydrology criterion had been met for this site in 2008 (Fucciolo et al. 2008), field indicators and evidence cited above indicate that wetland hydrology is present.

**DETERMINATION AND RATIONALE (C-1)**

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

**Rationale:** Dominant hydrophytic vegetation, hydric soils, and wetland hydrology are all present; therefore, this site is a wetland. The NWI did not identify this site as a wetland.



**ROUTINE ONSITE WETLAND DETERMINATION**

Site C (page 4 of 9)

**Field Investigator:** Feist and Wiesbrook     **Date:** 15-16 October 2008  
**Project Name:** Morris Wetland Bank  
**Job No.:** P-93-010-98     **Seq. No.:** 1306  
**State:** Illinois     **County:** Grundy     **Applicant:** IDOT District 3  
**Site Name:** Planned wetland  
**Legal Description:** SW/4 Sect. 10, T. 33 N., R. 7 E.  
**Location:** This planned wetland stretches from 122 m (400 ft) to 1265 m (4150 ft) east of Illinois 47 and is between 244 m (800 ft) to 1006 m (3300 ft) north of Pine Bluff Rd.

**HYDROLOGY (C-2)**

Inundated: Yes:     No: X     Depth of standing water: NA  
Depth to saturated soil: Undetermined  
Overview of hydrological flow through the system: It receives water via precipitation and occasional overflow from the Illinois and Mazon rivers. Water leaves the site primarily via evapotranspiration.  
Size of Watershed: Approximately 14023 km<sup>2</sup> (8714 mi<sup>2</sup>)  
Other field evidence observed: None  
**Wetland hydrology:** Yes:     No: X  
**Rationale:** There is no field evidence to indicate that this site is inundated or saturated for a sufficient duration to satisfy the wetland hydrology criterion. Also, the ISGS reported that the wetland hydrology criterion had not been met for this site in 2008 (Fucciolo et al. 2008).

**DETERMINATION AND RATIONALE (C-2)**

**Is the site a wetland?** Yes:     No: X  
**Rationale:** Dominant hydrophytic vegetation, hydric soils, and wetland hydrology are not present; therefore, this site is not a wetland. The NWI did not identify this site as a wetland.

**ROUTINE ONSITE WETLAND DETERMINATION**

Site C (page 5 of 9)

**Field Investigator:** Feist and Wiesbrook     **Date:** 15-16 October 2008**Project Name:** Morris Wetland Bank**Job No.:** P-93-010-98     **Seq. No.:** 1306**State:** Illinois     **County:** Grundy     **Applicant:** IDOT District 3**Site Name:** Planned wetland**Legal Description:** SW/4 Sect. 10, T. 33 N., R. 7 E.**Location:** This planned wetland stretches from 122 m (400 ft) to 1265 m (4150 ft) east of Illinois 47 and is between 244 m (800 ft) to 1006 m (3300 ft) north of Pine Bluff Rd.**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, herb	FACW-	1
<i>Acer saccharinum</i>	silver maple	herb	FACW	1
<i>Agropyron repens</i>	quack grass	herb	FACU	*
<i>Agrostis alba</i>	red top	herb	FACW	0
<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 syriaca</i>	common milkweed	herb	UPL	0
<i>Asclepias verticillata</i>	horsetail milkweed	herb	UPL	1
<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>Bidens frondosa</i>	common beggar's ticks	herb	FACW	1
<i>Brassica kaber</i>	charlock	herb	UPL	0
<i>Bromus commutatus</i>	hairy brome	herb	UPL	*
<i>Bromus inermis</i>	awnless brome grass	herb	UPL	*
<i>Carduus nutans</i>	musk bristle thistle	herb	UPL	*
<i>Campsis radicans</i>	trumpet creeper	shrub, herb	FAC	2
<i>Carex normalis</i>	sedge	herb	FACW	4
<i>Carex vulpinoidea</i>	fox sedge	herb	OBL	3
<i>Carya cordiformis</i>	bitternut hickory	shrub	FAC	4
<i>Cassia marilandica</i>	Maryland senna	herb	FACW	4
<i>Celtis occidentalis</i>	hackberry	shrub, herb	FAC-	3
<i>Chamaesyce maculata</i>	nodding spurge	herb	FACU-	0
<i>Chenopodium album</i>	lamb's quarters	herb	FAC-	*
<i>Cichorium intybus</i>	chickory	herb	UPL	*
<i>Cirsium arvense</i>	Canada thistle	herb	FACU	*

*Species list continued on next page.*

**ROUTINE ONSITE WETLAND DETERMINATION**

Site C (page 6 of 9)

**Field Investigator:** Feist and Wiesbrook     **Date:** 15-16 October 2008**Project Name:** Morris Wetland Bank**Job No.:** P-93-010-98     **Seq. No.:** 1306**State:** Illinois     **County:** Grundy     **Applicant:** IDOT District 3**Site Name:** Planned wetland**Legal Description:** SW/4 Sect. 10, T. 33 N., R. 7 E.**Location:** This planned wetland stretches from 122 m (400 ft) to 1265 m (4150 ft) east of Illinois 47 and is between 244 m (800 ft) to 1006 m (3300 ft) north of Pine Bluff Rd.**SPECIES LIST**

Scientific name	Common name	Stratum	Wetland indicator status	C†
<i>Cirsium discolor</i>	pasture thistle	herb	UPL	3
<i>Cirsium vulgare</i>	bull thistle	herb	FACU-	*
<i>Conyza canadensis</i>	horseweed	herb	FAC-	0
<i>Cyperus esculentus</i>	yellow nut-sedge	herb	FACW	0
<i>Cyperus strigosus</i>	straw-colored flatsedge	herb	FACW	0
<i>Dactylis glomerata</i>	orchard grass	herb	FACU	*
<i>Daucus carota</i>	Queen Anne's lace	herb	UPL	*
<i>Dipsacus sylvestris</i>	common teasel	herb	UPL	*
<i>Echinochloa muricata</i>	barnyard grass	herb	OBL	0
<i>Elymus canadensis</i>	Canada wild rye	herb	FAC-	4
<i>Elymus virginicus</i>	Virginia wild rye	herb	FACW-	4
<i>Erigeron annuus</i>	annual fleabane	herb	FAC-	1
<i>Erigeron strigosus</i>	daisy fleabane	herb	FAC-	2
<i>Eupatorium altissimum</i>	tall boneset	herb	FACU	2
<i>Eupatorium rugosum</i>	white snakeroot	herb	FACU	2
<i>Eupatorium serotinum</i>	late boneset	herb	FAC+	1
<i>Festuca pratensis</i>	meadow fescue	herb	FACU-	*
<i>Fraxinus pennsylvanica</i>	green ash	shrub, herb	FACW	2
<i>Geum canadense</i>	white avens	herb	FAC	2
<i>Geum laciniatum</i>	rough avens	herb	FACW	2
<i>Gleditsia triacanthos</i>	honey locust	shrub, herb	FAC	2
<i>Helianthus grosseserratus</i>	sawtooth sunflower	herb	FACW-	2
<i>Helianthus tuberosus</i>	Jerusalem artichoke	herb	FAC	3
<i>Hordeum jubatum</i>	squirrel-tail	herb	FAC+	*
<i>Juglans nigra</i>	black walnut	shrub	FACU	4
<i>Lactuca saligna</i>	willow-leaved lettuce	herb	FACU	*
<i>Leersia virginica</i>	white grass	herb	FACW	4
<i>Lepidium virginicum</i>	common peppergrass	herb	FACU-	0
<i>Lonicera maackii</i>	Amur honeysuckle	shrub	UPL	*
<i>Lotus corniculatus</i>	birdsfoot-trefoil	herb	FAC-	*

Species list continued on next page.

**ROUTINE ONSITE WETLAND DETERMINATION**

Site C (page 7 of 9)

**Field Investigator:** Feist and Wiesbrook     **Date:** 15-16 October 2008**Project Name:** Morris Wetland Bank**Job No.:** P-93-010-98     **Seq. No.:** 1306**State:** Illinois     **County:** Grundy     **Applicant:** IDOT District 3**Site Name:** Planned wetland**Legal Description:** SW/4 Sect. 10, T. 33 N., R. 7 E.**Location:** This planned wetland stretches from 122 m (400 ft) to 1265 m (4150 ft) east of Illinois 47 and is between 244 m (800 ft) to 1006 m (3300 ft) north of Pine Bluff Rd.**SPECIES LIST**

Scientific name	Common name	Stratum	Wetland indicator status	C†
<i>Lysimachia nummularia</i>	moneywort	herb	FACW+	*
<i>Malus</i> sp.	crabapple	shrub	----	--
<i>Melilotus alba</i>	white sweet clover	herb	FACU	*
<i>Melilotus officinalis</i>	yellow sweet clover	herb	FACU	*
<i>Morus alba</i>	white mulberry	shrub, herb	FAC	*
<i>Muhlenbergia frondosa</i>	common satin grass	herb	FACW	3
<i>Oxalis stricta</i>	yellow wood sorrel	herb	FACU	0
<i>Panicum dichotomiflorum</i>	fall panicum	herb	FACW-	0
<i>Phalaris arundinacea</i>	reed canary grass	herb	FACW+	*
<i>Phyla lanceolata</i>	fog-fruit	herb	OBL	1
<i>Physalis subglabrata</i>	smooth ground cherry	herb	UPL	0
<i>Phytolacca americana</i>	pokeweed	herb	FAC-	1
<i>Plantago lanceolata</i>	narrow-leaved plantain	herb	FAC	*
<i>Plantago rugelii</i>	red-stalked plantain	herb	FAC	0
<i>Poa pratensis</i>	Kentucky bluegrass	herb	FAC-	*
<i>Polygonum amphibium</i>	water smartweed	herb	OBL	3
<i>Polygonum aviculare</i>	knotweed	herb	FAC-	*
<i>Polygonum lapathifolium</i>	curttop lady's thumb	herb	FACW+	0
<i>Polygonum pensylvanicum</i>	giant smartweed	herb	FACW+	1
<i>Polygonum persicaria</i>	spotted lady's thumb	herb	FACW	*
<i>Populus deltoides</i>	eastern cottonwood	shrub, herb	FAC+	2
<i>Potentilla norvegica</i>	rough cinquefoil	herb	FAC	0
<i>Prunella vulgaris</i>	self-heal	herb	FAC	*
<i>Ptelea trifoliata</i>	wafer ash	shrub	FACU+	4
<i>Quercus bicolor</i>	swamp white oak	shrub	FACW+	7
<i>Rorippa islandica</i>	marsh yellow cress	herb	OBL	4
<i>Rorippa sylvestris</i>	creeping yellow cress	herb	OBL	*
<i>Rosa multiflora</i>	multiflora rose	shrub	FACU	*
<i>Rudbeckia laciniata</i>	cutleaf coneflower	herb	FACW+	3
<i>Rudbeckia triloba</i>	brown-eyed Susan	herb	FAC-	3
<i>Rumex altissimus</i>	pale dock	herb	FACW-	2

Species list continued on next page.

**ROUTINE ONSITE WETLAND DETERMINATION**

Site C (page 8 of 9)

**Field Investigator:** Feist and Wiesbrook    **Date:** 15-16 October 2008**Project Name:** Morris Wetland Bank**Job No.:** P-93-010-98    **Seq. No.:** 1306**State:** Illinois    **County:** Grundy    **Applicant:** IDOT District 3**Site Name:** Planned wetland**Legal Description:** SW/4 Sect. 10, T. 33 N., R. 7 E.**Location:** This planned wetland stretches from 122 m (400 ft) to 1265 m (4150 ft) east of Illinois 47 and is between 244 m (800 ft) to 1006 m (3300 ft) north of Pine Bluff Rd.**SPECIES LIST**

Scientific name	Common name	Stratum	Wetland indicator status	C†
<i>Rumex crispus</i>	curly dock	herb	FAC+	*
<i>Sambucus canadensis</i>	common elder	shrub	FACW-	2
<i>Setaria faberi</i>	giant foxtail	herb	FACU+	*
<i>Setaria glauca</i>	pigeon grass	herb	FAC	*
<i>Setaria verticillata</i>	bristly foxtail	herb	FAC	*
<i>Setaria viridis</i> var. <i>major</i>	tall green foxtail	herb	UPL	*
<i>Sida spinosa</i>	prickly sida	herb	FACU	*
<i>Smilax hispida</i>	bristly greenbrier	vine	FAC	3
<i>Solanum carolinense</i>	horse nettle	herb	FACU-	0
<i>Solanum dulcamara</i>	false bittersweet	herb	FAC	*
<i>Solidago canadensis</i>	Canada goldenrod	herb	FACU	1
<i>Sonchus arvensis</i>	field sowthistle	herb	FAC-	*
<i>Taraxacum officinale</i>	common dandelion	herb	FACU	*
<i>Teucrium canadense</i>	American germander	herb	FACW-	3
<i>Thlaspi arvense</i>	field penny cress	herb	UPL	*
<i>Toxicodendron radicans</i>	poison ivy	herb	FAC+	1
<i>Tragopogon dubius</i>	goat's beard	herb	UPL	*
<i>Trifolium hybridum</i>	alsike clover	herb	FAC-	*
<i>Trifolium pratense</i>	red clover	herb	FACU+	*
<i>Trifolium repens</i>	white clover	herb	FACU+	*
<i>Ulmus pumila</i>	Siberian elm	shrub, herb	UPL	*
<i>Ulmus americana</i>	American elm	shrub, herb	FACW-	5
<i>Urtica dioica</i>	stinging nettle	herb	FAC+	2
<i>Verbascum thapsus</i>	woolly mullein	herb	UPL	*
<i>Verbena urticifolia</i>	white vervain	herb	FAC+	3
<i>Verbesina alternifolia</i>	wingstem	herb	FACW	4
<i>Vitis riparia</i>	riverbank grape	herb	FACW-	2
<i>Xanthium strumarium</i>	cocklebur	herb	FAC	0

†Coefficient of Conservatism (Taft et al. 1997)

\*Non-native species

Percent native species = (72/117) \* 100 = 61.5%

 $\bar{c} = \sum C/N = 134/72 = 1.9$ FQI =  $\sum C / \sqrt{N} = 134/\sqrt{72} = 15.8$

**ROUTINE ONSITE WETLAND DETERMINATION**

Site C (page 9 of 9)

**Field Investigator:** Feist and Wiesbrook      **Date:** 15-16 October 2008

**Project Name:** Morris Wetland Bank

**Job No.:** P-93-010-98      **Seq. No.:** 1306

**State:** Illinois      **County:** Grundy      **Applicant:** IDOT District 3

**Site Name:** Planned wetland

**Legal Description:** SW/4 Sect. 10, T. 33 N., R. 7 E.

**Location:** This planned wetland stretches from 122 m (400 ft) to 1265 m (4150 ft) east of Illinois 47 and is between 244 m (800 ft) to 1006 m (3300 ft) north of Pine Bluff Rd.

Determined by: Mary Ann Feist (vegetation and hydrology)  
Scott Wiesbrook (soils and hydrology)  
Illinois Natural History Survey  
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Illinois State Geological Survey  
615 East Peabody Drive  
Champaign, Illinois 61820



**ROUTINE ONSITE WETLAND DETERMINATION**

Site H (page 2 of 9)

**Field Investigator:** Feist and Wiesbrook     **Date:** 15-16 October 2008  
**Project Name:** Morris Wetland Bank  
**Job No.:** P-93-010-98     **Seq. No.:** 1306  
**State:** Illinois     **County:** Grundy     **Applicant:** IDOT District 3  
**Site Name:** Planned wetland  
**Legal Description:** NW/4, NW/4 Sect. 11, T. 33 N., R. 7 E.  
**Location:** This planned wetland occurs in the open area between the gravel road that bisects the project area and the Mazon River, between 1326 m (4350 ft) to 1798 (5900 ft) north of Pine Bluff Road.

**HYDROLOGY (H-1)**

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

Depth to saturated soil: Undetermined

Overview of hydrological flow through the system: This site occupies a shallow drainageway. It receives water via precipitation and runoff from surrounding higher ground and overflow from the Mazon River. Water leaves the site primarily via evapotranspiration, soil infiltration, and stream flow into the Mazon River.

Size of Watershed: Approximately 14023 km<sup>2</sup> (8714 mi<sup>2</sup>)

Other field evidence observed: Wetland drainage patterns and water-borne sediment deposits were observed.

**Wetland hydrology:** Yes: X     No:

**Rationale:** Although, the ISGS did not report that the wetland hydrology criterion had been met for this site in 2008 (Fucciolo et al. 2008), field indicators and evidence cited above indicate that wetland hydrology is present.

**DETERMINATION AND RATIONALE (H-1)**

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

**Rationale:** Dominant hydrophytic vegetation, hydric soils, and wetland hydrology are all present; therefore, this site is a wetland. The NWI did not identify this site as a wetland.

**ROUTINE ONSITE WETLAND DETERMINATION**

Site H (page 3 of 9)

**Field Investigator:** Feist and Wiesbrook      **Date:** 15-16 October 2008

**Project Name:** Morris Wetland Bank

**Job No.:** P-93-010-98      **Seq. No.:** 1306

**State:** Illinois      **County:** Grundy      **Applicant:** IDOT District 3

**Site Name:** Planned wetland

**Legal Description:** NW/4, NW/4 Sect. 11, T. 33 N., R. 7 E.

**Location:** This planned wetland occurs in the open area between the gravel road that bisects the project area and the Mazon River, between 1326 m (4350 ft) to 1798 (5900 ft) north of Pine Bluff Road.

Do normal environmental conditions exist at this site?      Yes:  No:

Has the vegetation, soils, or hydrology been significantly disturbed? Yes:      No:

**VEGETATION (H-2)**

<b>Dominant Plant Species</b>	<b>Indicator Status</b>	<b>Stratum</b>
1. <i>Bromus japonicus</i>	FACU	herb
2. <i>Elymus virginicus</i>	FACW-	herb
3. <i>Phalaris arundinacea</i>	FACW+	herb
4. <i>Poa pratensis</i>	FAC-	herb
5. <i>Solidago canadensis</i>	FACU	herb

Percentage of dominant species that are OBL, FACW, FAC+, or FAC: 40%

**Hydrophytic vegetation:** Yes:      No:

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

**SOILS (H-2)**

Series and phase: Lawson silt loam (Aquic Cumulic Hapludoll)

On county hydric soils list?      Yes:      No:

Is the soil a histosol?      Yes:      No:

Histic epipedon present?      Yes:      No:

Redox Concentrations?      Yes:      No:       Color: N/A

Redox Depletions?      Yes:      No:       Color: N/A

Matrix color: 10YR 3/1

Other indicators: None

**Hydric soils?** Yes:      No:

**Rationale:** The Natural Resources Conservation Service identifies Lawson as an Aquic Cumulic Hapludoll which is somewhat poorly drained. This soil does not possess any redoximorphic features. Therefore, the soil at this site does not meet the hydric soil criteria. This soil does not meet any of the NRCS hydric soil indicators.

**ROUTINE ONSITE WETLAND DETERMINATION**

Site H (page 4 of 9)

**Field Investigator:** Feist and Wiesbrook     **Date:** 15-16 October 2008  
**Project Name:** Morris Wetland Bank  
**Job No.:** P-93-010-98     **Seq. No.:** 1306  
**State:** Illinois     **County:** Grundy     **Applicant:** IDOT District 3  
**Site Name:** Planned wetland  
**Legal Description:** NW/4, NW/4 Sect. 11, T. 33 N., R. 7 E.  
**Location:** This planned wetland occurs in the open area between the gravel road that bisects the project area and the Mazon River, between 1326 m (4350 ft) to 1798 (5900 ft) north of Pine Bluff Rd.

**HYDROLOGY (H-2)**

Inundated: Yes:     No: X     Depth of standing water: NA  
Depth to saturated soil: Undetermined  
Overview of hydrological flow through the system: It receives water via precipitation and occasional overflow from the Illinois and Mazon rivers. Water leaves the site primarily via evapotranspiration.  
Size of Watershed: Approximately 14023 km<sup>2</sup> (8714 mi<sup>2</sup>)  
Other field evidence observed: None  
**Wetland hydrology:** Yes:     No: X  
**Rationale:** There is no field evidence to indicate that this site is inundated or saturated for a sufficient duration to satisfy the wetland hydrology criterion. Also, the ISGS reported that the wetland hydrology criterion had not been met for this site in 2008 (Fucciolo et al. 2008).

**DETERMINATION AND RATIONALE (H-2)**

**Is the site a wetland?** Yes:     No: X  
**Rationale:** Dominant hydrophytic vegetation, hydric soils, or wetland hydrology are all absent; therefore this site is not a wetland. The NWI did not code this site as a wetland.

**ROUTINE ONSITE WETLAND DETERMINATION**

Site H (page 5 of 9)

**Field Investigator:** Feist and Wiesbrook     **Date:** 15-16 October 2008**Project Name:** Morris Wetland Bank**Job No.:** P-93-010-98     **Seq. No.:** 1306**State:** Illinois     **County:** Grundy     **Applicant:** IDOT District 3**Site Name:** Planned wetland**Legal Description:** NW/4, NW/4 Sect. 11, T. 33 N., R. 7 E.**Location:** This planned wetland occurs in the open area between the gravel road that bisects the project area and the Mazon River, between 1326 m (4350 ft) to 1798 (5900 ft) north of Pine Bluff Rd.**SPECIES LIST**

<b>Scientific name</b>	<b>Common name</b>	<b>Stratum</b>	<b>Wetland indicator status</b>	<b>C†</b>
<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, herb	FACW-	1
<i>Acer saccharinum</i>	silver maple	shrub, herb	FACW	1
<i>Agropyron repens</i>	quack grass	herb	FACU	*
<i>Agrostis alba</i>	red top	herb	FACW	0
<i>Alliaria petiolata</i>	garlic mustard	herb	FAC	*
<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>Amorpha fruticosa</i>	false indigo bush	shrub	FACW+	6
<i>Apocynum cannabinum</i>	dogbane	herb	FAC	2
<i>Asclepias syriaca</i>	common milkweed	herb	UPL	0
<i>Asclepias verticillata</i>	horsetail milkweed	herb	UPL	1
<i>Aster ontarionis</i>	Ontario aster	herb	FAC	4
<i>Aster pilosus</i>	hairy aster	herb	FACU+	0
<i>Aster simplex</i>	panicked aster	herb	FACW	3
<i>Atriplex patula</i>	fat-hen saltbush	herb	FACU+	*
<i>Bidens frondosa</i>	common beggar's ticks	herb	FACW	1
<i>Bidens tripartita</i>	beggar's ticks	herb	OBL	2
<i>Brassica kaber</i>	charlock	herb	UPL	0
<i>Bromus commutatus</i>	hairy brome	herb	UPL	*
<i>Bromus inermis</i>	awnless brome grass	herb	UPL	*
<i>Campsis radicans</i>	trumpet creeper	shrub, herb	FAC	2
<i>Capsella bursa-pastoris</i>	shepherd's-purse	herb	FAC-	*
<i>Carex conjuncta</i>	green-headed fox sedge	herb	FACW	5
<i>Carex molesta</i>	sedge	herb	FAC	2
<i>Carex normalis</i>	sedge	herb	FACW	4
<i>Carex vulpinoidea</i>	fox sedge	herb	OBL	3
<i>Chamaesyce maculata</i>	nodding spurge	herb	FACU-	0
<i>Chenopodium album</i>	lamb's quarters	herb	FAC-	*

Species list continued on next page.

**ROUTINE ONSITE WETLAND DETERMINATION**

Site H (page 6 of 9)

**Field Investigator:** Feist and Wiesbrook     **Date:** 15-16 October 2008**Project Name:** Morris Wetland Bank**Job No.:** P-93-010-98     **Seq. No.:** 1306**State:** Illinois     **County:** Grundy     **Applicant:** IDOT District 3**Site Name:** Planned wetland**Legal Description:** NW/4, NW/4 Sect. 11, T. 33 N., R. 7 E.**Location:** This planned wetland occurs in the open area between the gravel road that bisects the project area and the Mazon River, between 1326 m (4350 ft) to 1798 (5900 ft) north of Pine Bluff Rd.**SPECIES LIST**

<b>Scientific name</b>	<b>Common name</b>	<b>Stratum</b>	<b>Wetland indicator status</b>	<b>C†</b>
<i>Cichorium intybus</i>	chickory	herb	UPL	*
<i>Cirsium arvense</i>	Canada thistle	herb	FACU	*
<i>Cirsium discolor</i>	pasture thistle	herb	UPL	3
<i>Cirsium vulgare</i>	bull thistle	herb	FACU-	*
<i>Conyza canadensis</i>	horseweed	herb	FAC-	0
<i>Cynanchum laeve</i>	blue vine	herb	FAC	1
<i>Cyperus esculentus</i>	yellow nut-sedge	herb	FACW	0
<i>Dactylis glomerata</i>	orchard grass	herb	FACU	*
<i>Daucus carota</i>	Queen Anne's lace	herb	UPL	*
<i>Desmodium illinoense</i>	illinois tick trefoil	herb	UPL	5
<i>Echinochloa muricata</i>	barnyard grass	herb	OBL	0
<i>Elaeagnus umbellata</i>	autumn olive	shrub	UPL	*
<i>Elymus canadensis</i>	Canada wild rye	herb	FAC-	4
<i>Elymus virginicus</i>	Virginia wild rye	herb	FACW-	4
<i>Erigeron annuus</i>	annual fleabane	herb	FAC-	1
<i>Eupatorium altissimum</i>	tall boneset	herb	FACU	2
<i>Eupatorium rugosum</i>	white snakeroot	herb	FACU	2
<i>Eupatorium serotinum</i>	late boneset	herb	FAC+	1
<i>Festuca pratensis</i>	meadow fescue	herb	FACU-	*
<i>Geum canadense</i>	white avens	herb	FAC	2
<i>Geum laciniatum</i>	rough avens	herb	FACW	2
<i>Glechoma hederacea</i>	ground ivy	herb	FACU	*
<i>Gleditsia triacanthos</i>	honey locust	shrub, herb	FAC	2
<i>Helianthus tuberosus</i>	Jerusalem artichoke	herb	FAC	3
<i>Hordeum jubatum</i>	squirrel-tail	herb	FAC+	*
<i>Lactuca saligna</i>	willow-leaved lettuce	herb	FACU	*
<i>Laportea canadensis</i>	wood nettle	herb	FACW	2
<i>Leonurus cardiaca</i>	motherwort	herb	UPL	*

Species list continued on next page.

**ROUTINE ONSITE WETLAND DETERMINATION**

Site H (page 7 of 9)

**Field Investigator:** Feist and Wiesbrook     **Date:** 15-16 October 2008**Project Name:** Morris Wetland Bank**Job No.:** P-93-010-98     **Seq. No.:** 1306**State:** Illinois     **County:** Grundy     **Applicant:** IDOT District 3**Site Name:** Planned wetland**Legal Description:** NW/4, NW/4 Sect. 11, T. 33 N., R. 7 E.**Location:** This planned wetland occurs in the open area between the gravel road that bisects the project area and the Mazon River, between 1326 m (4350 ft) to 1798 (5900 ft) north of Pine Bluff Rd.**SPECIES LIST**

Scientific name	Common name	Stratum	Wetland indicator status	C†
<i>Lepidium virginicum</i>	common peppergrass	herb	FACU-	0
<i>Lycopus americanus</i>	common water horehound	herb	OBL	3
<i>Lysimachia nummularia</i>	moneywort	herb	FACW+	*
<i>Maclura pomifera</i>	hedge apple	shrub	FACU	*
<i>Medicago lupulina</i>	black medic	herb	FAC-	*
<i>Medicago sativa</i>	alfalfa	herb	UPL	*
<i>Melilotus alba</i>	white sweet clover	herb	FACU	*
<i>Melilotus officinalis</i>	yellow sweet clover	herb	FACU	*
<i>Morus alba</i>	white mulberry	shrub, herb	FAC	*
<i>Oxalis stricta</i>	yellow wood sorrel	herb	FACU	0
<i>Panicum dichotomiflorum</i>	fall panicum	herb	FACW-	0
<i>Panicum virgatum</i>	prairie switchgrass	herb	FAC+	4
<i>Phalaris arundinacea</i>	reed canary grass	herb	FACW+	*
<i>Phleum pratense</i>	Timothy	herb	FACU	*
<i>Phyla lanceolata</i>	fog-fruit	herb	OBL	1
<i>Phytolacca americana</i>	pokeweed	herb	FAC-	1
<i>Pilea pumila</i>	Canada clearweed	herb	FACW	3
<i>Plantago lanceolata</i>	narrow-leaved plantain	herb	FAC	*
<i>Plantago rugelii</i>	red-stalked plantain	herb	FAC	0
<i>Poa compressa</i>	Canadian bluegrass	herb	FACU+	*
<i>Poa pratensis</i>	Kentucky bluegrass	herb	FAC-	*
<i>Polygonum aviculare</i>	knotweed	herb	FAC-	*
<i>Polygonum pensylvanicum</i>	giant smartweed	herb	FACW+	1
<i>Polygonum persicaria</i>	spotted lady's thumb	herb	FACW	*
<i>Populus deltoides</i>	eastern cottonwood	sapling, shrub, herb	FAC+	2
<i>Prunella vulgaris</i>	self-heal	herb	FAC	*
<i>Ptelea trifoliata</i>	wafer ash	shrub	FACU+	4
<i>Rorippa islandica</i>	marsh yellow cress	herb	OBL	4
<i>Rorippa sylvestris</i>	creeping yellow cress	herb	OBL	*
<i>Rudbeckia laciniata</i>	cutleaf coneflower	herb	FACW+	3
<i>Rumex altissimus</i>	pale dock	herb	FACW-	2

Species list continued on next page.

**ROUTINE ONSITE WETLAND DETERMINATION**

Site H (page 8 of 9)

**Field Investigator:** Feist and Wiesbrook     **Date:** 15-16 October 2008**Project Name:** Morris Wetland Bank**Job No.:** P-93-010-98     **Seq. No.:** 1306**State:** Illinois     **County:** Grundy     **Applicant:** IDOT District 3**Site Name:** Planned wetland**Legal Description:** NW/4, NW/4 Sect. 11, T. 33 N., R. 7 E.**Location:** This planned wetland occurs in the open area between the gravel road that bisects the project area and the Mazon River, between 1326 m (4350 ft) to 1798 (5900 ft) north of Pine Bluff Rd.**SPECIES LIST**

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>Setaria faberi</i>	giant foxtail	herb	FACU+	*
<i>Setaria glauca</i>	pigeon grass	herb	FAC	*
<i>Setaria verticillata</i>	bristly foxtail	herb	FAC	*
<i>Setaria viridis</i> var. <i>major</i>	tall green foxtail	herb	UPL	*
<i>Sida spinosa</i>	prickly sida	herb	FACU	*
<i>Silphium perfoliatum</i>	cup plant	herb	FACW-	4
<i>Smilax hispida</i>	bristly greenbrier	vine	FAC	3
<i>Solanum carolinense</i>	horse nettle	herb	FACU-	0
<i>Solanum dulcamara</i>	false bittersweet	herb	FAC	*
<i>Solidago canadensis</i>	Canada goldenrod	herb	FACU	1
<i>Solidago gigantea</i>	late goldenrod	herb	FACW	3
<i>Sonchus arvensis</i>	field sowthistle	herb	FAC-	*
<i>Taraxacum officinale</i>	common dandelion	herb	FACU	*
<i>Teucrium canadense</i>	American germander	herb	FACW-	3
<i>Thlaspi arvense</i>	field penny cress	herb	UPL	*
<i>Toxicodendron radicans</i>	poison ivy	herb	FAC+	1
<i>Tridens flavus</i>	common purple top	herb	UPL	1
<i>Trifolium hybridum</i>	alsike clover	herb	FAC-	*
<i>Trifolium pratense</i>	red clover	herb	FACU+	*
<i>Trifolium repens</i>	white clover	herb	FACU+	*
<i>Urtica dioica</i>	stinging nettle	herb	FAC+	2
<i>Verbascum blattaria</i>	moth mullein	herb	FACU-	*
<i>Verbena urticifolia</i>	white vervain	herb	FAC+	3
<i>Verbesina alternifolia</i>	wingstem	herb	FACW	4
<i>Viola pratincola</i>	common blue violet	herb	FAC	1
<i>Vitis riparia</i>	riverbank grape	herb	FACW-	2
<i>Xanthium strumarium</i>	cocklebur	herb	FAC	0

†Coefficient of Conservatism (Taft et al. 1997)

\*Non-native species

Percent native species = (70/119) \* 100 = 58.8%

 $\bar{C} = \sum C/N = 129/70 = 1.8$  $FQI = \sum C/\sqrt{N} = 129/\sqrt{70} = 15.4$

**ROUTINE ONSITE WETLAND DETERMINATION**

Site H (page 9 of 9)

**Field Investigator:** Feist and Wiesbrook      **Date:** 15-16 October 2008

**Project Name:** Morris Wetland Bank

**Job No.:** P-93-010-98      **Seq. No.:** 1306

**State:** Illinois      **County:** Grundy      **Applicant:** IDOT District 3

**Site Name:** Planned wetland

**Legal Description:** NW/4, NW/4 Sect. 11, T. 33 N., R. 7 E.

**Location:** This planned wetland occurs in the open area between the gravel road that bisects the project area and the Mazon River, between 1326 m (4350 ft) to 1798 (5900 ft) north of Pine Bluff Rd.

Determined by: Mary Ann Feist (vegetation and hydrology)  
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## ROUTINE ONSITE WETLAND DETERMINATION

Site K (page 2 of 8)

**Field Investigator:** Feist and Wiesbrook      **Date:** 15-16 October 2008  
**Project Name:** Morris Wetland Bank  
**Job No.:** P-93-010-98      **Seq. No.:** 1306  
**State:** Illinois      **County:** Grundy      **Applicant:** IDOT District 3  
**Site Name:** Planned wetland  
**Legal Description:** N/2 Sect. 11, T. 33 N., R. 7 E.  
**Location:** This planned wetland is located in the large field in the eastern most portion of the project area.

### HYDROLOGY (K-1)

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

Depth to saturated soil: Undetermined

Overview of hydrological flow through the system: This site consists of two separate low areas within the landscape. Each receives water via precipitation and runoff from surrounding higher ground and occasional overflow from the Illinois and Mazon rivers. Water leaves the site primarily via evapotranspiration, soil infiltration, and drainage into the Mazon River.

Size of Watershed: Approximately 14023 km<sup>2</sup> (8714 mi<sup>2</sup>)

Other field evidence observed: This site occupies low positions within the landscape. Water-borne sediment deposits and wetland drainage patterns were observed.

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

**Rationale:** Field evidence cited above indicates that wetland hydrology is present. Also, the ISGS reported that the wetland hydrology criterion had been met for this portion of the site in 2008 (Fucciolo et al. 2008). In our opinion, this site is inundated or saturated for a sufficient duration to satisfy the wetland hydrology criterion.

### DETERMINATION AND RATIONALE (K-1)

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

**Rationale:** Dominant hydrophytic vegetation, hydric soils, and wetland hydrology are present throughout this site; therefore, this site is a wetland.

**ROUTINE ONSITE WETLAND DETERMINATION**

Site K (page 3 of 8)

**Field Investigator:** Feist and Wiesbrook      **Date:** 15-16 October 2008  
**Project Name:** Morris Wetland Bank  
**Job No.:** P-93-010-98      **Seq. No.:** 1306  
**State:** Illinois      **County:** Grundy      **Applicant:** IDOT District 3  
**Site Name:** Planned wetland  
**Legal Description:** N/2 Sect. 11, T. 33 N., R. 7 E.  
**Location:** This planned wetland is located in the large field in the eastern most portion of the project area.

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

**VEGETATION (K-2)**

Dominant Plant Species	Indicator Status	Stratum
1. <i>Aster pilosus</i>	FACU+	herb
2. <i>Elymus virginicus</i>	FACW-	herb
3. <i>Plantago rugelii</i>	FAC	herb
4. <i>Poa pratensis</i>	FAC-	herb
5. <i>Setaria faberi</i>	FACU+	herb
6. <i>Solidago canadensis</i>	FACU	herb

Percentage of dominant species that are OBL, FACW, FAC+, or FAC: 33%

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

**SOILS (K-2)**

Series and phase: Lawson silt loam (Aquic Cumulic Hapludoll)  
 On 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 3/1  
 Other indicators: None

**Hydric soils?** Yes:      No: X  
**Rationale:** The Natural Resources Conservation Service identifies Lawson as an Aquic Cumulic Hapludoll which is somewhat poorly drained. This soil does not possess any redoximorphic features. Therefore, the soil at this site does not meet the hydric soil criteria. This soil does not meet any of the NRCS hydric soil indicators.

**ROUTINE ONSITE WETLAND DETERMINATION**

Site K (page 4 of 8)

**Field Investigator:** Feist and Wiesbrook    **Date:** 15-16 October 2008  
**Project Name:** Morris Wetland Bank  
**Job No.:** P-93-010-98    **Seq. No.:** 1306  
**State:** Illinois    **County:** Grundy    **Applicant:** IDOT District 3  
**Site Name:** Planned wetland  
**Legal Description:** N/2 Sect. 11, T. 33 N., R. 7 E.  
**Location:** This planned wetland is located in the large field in the easternmost portion of the project area.

**HYDROLOGY (K-2)**

Inundated: Yes:            No: X                            Depth of standing water: None  
Depth to saturated soil: Undetermined  
Overview of hydrological flow through the system: It receives water via precipitation and occasional overflow from the Illinois and Mazon rivers. Water leaves the site primarily via evapotranspiration.  
Size of Watershed: Approximately 14023 km<sup>2</sup> (8714 mi<sup>2</sup>)  
Other field evidence observed: None  
**Wetland hydrology:** Yes:                            No: X  
**Rationale:** There is no field evidence to indicate that this site is inundated or saturated for a sufficient duration to satisfy the wetland hydrology criterion. Also, the ISGS reported that the wetland hydrology criterion had not been met for this site in 2007 (Fucciolo et al. 2007).

**DETERMINATION AND RATIONALE (K-2)**

**Is the site a wetland?** Yes:                            No: X  
**Rationale:** Dominant hydrophytic vegetation, hydric soils, and wetland hydrology are all absent; therefore, this part of the site is not a wetland.

**ROUTINE ONSITE WETLAND DETERMINATION**

Site K (page 5 of 8)

**Field Investigator:** Feist and Wiesbrook     **Date:** 15-16 October 2008**Project Name:** Morris Wetland Bank**Job No.:** P-93-010-98     **Seq. No.:** 1306**State:** Illinois     **County:** Grundy     **Applicant:** IDOT District 3**Site Name:** Planned wetland**Legal Description:** N/2 Sect. 11, T. 33 N., R. 7 E.**Location:** This planned wetland is located in the large field in the eastern most portion of the project area.**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, herb	FACW-	1
<i>Agropyron repens</i>	quack grass	herb	FACU	*
<i>Agrostis alba</i>	red top	herb	FACW	0
<i>Alliaria petiolata</i>	garlic mustard	herb	FAC	*
<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 ericoides</i>	heath aster	herb	FACU-	4
<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>Bidens frondosa</i>	common beggar's ticks	herb	FACW	1
<i>Bidens tripartita</i>	beggar's ticks	herb	OBL	2
<i>Bromus commutatus</i>	hairy brome	herb	UPL	*
<i>Bromus inermis</i>	awnless brome grass	herb	UPL	*
<i>Bromus japonicus</i>	Japanese brome	herb	FACU	*
<i>Campsis radicans</i>	trumpet creeper	shrub, herb	FAC	2
<i>Carex conjuncta</i>	green-headed fox sedge	herb	FACW	5
<i>Carex davisii</i>	Davis sedge	herb	FAC+	3
<i>Carex grayi</i>	bur sedge	herb	FACW+	6
<i>Carex normalis</i>	sedge	herb	FACW	4
<i>Carex vulpinoidea</i>	fox sedge	herb	OBL	3
<i>Celtis occidentalis</i>	hackberry	shrub, herb	FAC-	3
<i>Chaerophyllum procumbens</i>	wild chervil	herb	FAC+	1
<i>Cichorium intybus</i>	chickory	herb	UPL	*
<i>Cirsium arvense</i>	Canada thistle	herb	FACU	*
<i>Cirsium discolor</i>	pasture thistle	herb	UPL	3
<i>Cirsium vulgare</i>	bull thistle	herb	FACU-	*

Species list continued on next page.

**ROUTINE ONSITE WETLAND DETERMINATION**

Site K (page 6 of 8)

**Field Investigator:** Feist and Wiesbrook     **Date:** 15-16 October 2008**Project Name:** Morris Wetland Bank**Job No.:** P-93-010-98     **Seq. No.:** 1306**State:** Illinois     **County:** Grundy     **Applicant:** IDOT District 3**Site Name:** Planned wetland**Legal Description:** N/2 Sect. 11, T. 33 N., R. 7 E.**Location:** This planned wetland is located in the large field in the eastern most portion of the project area.**SPECIES LIST**

<b>Scientific name</b>	<b>Common name</b>	<b>Stratum</b>	<b>Wetland indicator status</b>	<b>C†</b>
<i>Conyza canadensis</i>	horseweed	herb	FAC-	0
<i>Coronilla varia</i>	crown vetch	herb	UPL	*
<i>Cynanchum laeve</i>	blue vine	herb	FAC	1
<i>Dactylis glomerata</i>	orchard grass	herb	FACU	*
<i>Echinochloa muricata</i>	barnyard grass	herb	OBL	0
<i>Elaeagnus umbellata</i>	autumn olive	shrub	UPL	*
<i>Elymus canadensis</i>	Canada wild rye	herb	FAC-	4
<i>Elymus virginicus</i>	Virginia wild rye	herb	FACW-	4
<i>Erigeron annuus</i>	annual fleabane	herb	FAC-	1
<i>Erigeron strigosus</i>	daisy fleabane	herb	FAC-	2
<i>Eupatorium rugosum</i>	white snakeroot	herb	FACU	2
<i>Eupatorium serotinum</i>	late boneset	herb	FAC+	1
<i>Festuca pratensis</i>	meadow fescue	herb	FACU-	*
<i>Geum canadense</i>	white avens	herb	FAC	2
<i>Geum laciniatum</i>	rough avens	herb	FACW	2
<i>Glechoma hederacea</i>	ground ivy	herb	FACU	*
<i>Gleditsia triacanthos</i>	honey locust	shrub, herb	FAC	2
<i>Helianthus tuberosus</i>	Jerusalem artichoke	herb	FAC	3
<i>Hordeum jubatum</i>	squirrel-tail	herb	FAC+	*
<i>Ipomoea lacunosa</i>	small morning glory	herb	FACW	1
<i>Juglans nigra</i>	black walnut	shrub, herb	FACU	4
<i>Lactuca serriola</i>	prickly lettuce	herb	FAC	*
<i>Lonicera maackii</i>	Amur honeysuckle	shrub	UPL	*
<i>Lycopus americanus</i>	common water horehound	herb	OBL	3
<i>Lysimachia nummularia</i>	moneywort	herb	FACW+	*
<i>Medicago lupulina</i>	black medic	herb	FAC-	*
<i>Melilotus alba</i>	white sweet clover	herb	FACU	*
<i>Melilotus officinalis</i>	yellow sweet clover	herb	FACU	*
<i>Morus alba</i>	white mulberry	shrub, herb	FAC	*
<i>Muhlenbergia frondosa</i>	common satin grass	herb	FACW	3
<i>Oenothera biennis</i>	evening primrose	herb	FACU	1

Species list continued on next page.

**ROUTINE ONSITE WETLAND DETERMINATION**

Site K (page 7 of 8)

**Field Investigator:** Feist and Wiesbrook     **Date:** 15-16 October 2008**Project Name:** Morris Wetland Bank**Job No.:** P-93-010-98     **Seq. No.:** 1306**State:** Illinois     **County:** Grundy     **Applicant:** IDOT District 3**Site Name:** Planned wetland**Legal Description:** N/2 Sect. 11, T. 33 N., R. 7 E.**Location:** This planned wetland is located in the large field in the eastern most portion of the project area.**SPECIES LIST**

Scientific name	Common name	Stratum	Wetland indicator status	C†
<i>Oxalis stricta</i>	yellow wood sorrel	herb	FACU	0
<i>Panicum implicatum</i>	old field panic grass	herb	FAC	2
<i>Pastinaca sativa</i>	parsnip	herb	UPL	*
<i>Phalaris arundinacea</i>	reed canary grass	herb	FACW+	*
<i>Phleum pratense</i>	Timothy	herb	FACU	*
<i>Phyla lanceolata</i>	fog-fruit	herb	OBL	1
<i>Physostegia virginiana</i>	false dragonhead	herb	FACW	6
<i>Plantago lanceolata</i>	narrow-leaved plantain	herb	FAC	*
<i>Plantago rugelii</i>	red-stalked plantain	herb	FAC	0
<i>Poa pratensis</i>	Kentucky bluegrass	herb	FAC-	*
<i>Polygonum amphibium</i>	water smartweed	herb	OBL	3
<i>Polygonum aviculare</i>	knotweed	herb	FAC-	*
<i>Polygonum lapathifolium</i>	curttop lady's thumb	herb	FACW+	0
<i>Polygonum persicaria</i>	spotted lady's thumb	herb	FACW	*
<i>Populus deltoides</i>	eastern cottonwood	shrub, herb	FAC+	2
<i>Potentilla norvegica</i>	rough cinquefoil	herb	FAC	0
<i>Prunella vulgaris</i>	self-heal	herb	FAC	*
<i>Ranunculus abortivus</i>	little-leaf buttercup	herb	FACW-	1
<i>Rorippa islandica</i>	marsh yellow cress	herb	OBL	4
<i>Rosa multiflora</i>	multiflora rose	shrub	FACU	*
<i>Rudbeckia laciniata</i>	cutleaf coneflower	herb	FACW+	3
<i>Rudbeckia triloba</i>	brown-eyed Susan	herb	FAC-	3
<i>Rumex altissimus</i>	pale dock	herb	FACW-	2
<i>Rumex crispus</i>	curly dock	herb	FAC+	*
<i>Salix amygdaloides</i>	peach-leaved willow	shrub	FACW	4
<i>Salix exigua</i>	sandbar willow	shrub	OBL	1
<i>Salix nigra</i>	black willow	shrub	OBL	3
<i>Sambucus canadensis</i>	common elder	shrub	FACW-	2
<i>Sanicula gregaria</i>	common snakeroot	herb	FAC+	2
<i>Setaria faberi</i>	giant foxtail	herb	FACU+	*
<i>Setaria glauca</i>	pigeon grass	herb	FAC	*
<i>Sida spinosa</i>	prickly sida	herb	FACU	*
<i>Solanum carolinense</i>	horse nettle	herb	FACU-	0

Species list continued on next page.

**ROUTINE ONSITE WETLAND DETERMINATION**

Site K (page 8 of 8)

**Field Investigator:** Feist and Wiesbrook     **Date:** 15-16 October 2008**Project Name:** Morris Wetland Bank**Job No.:** P-93-010-98     **Seq. No.:** 1306**State:** Illinois     **County:** Grundy     **Applicant:** IDOT District 3**Site Name:** Planned wetland**Legal Description:** N/2 Sect. 11, T. 33 N., R. 7 E.**Location:** This planned wetland is located in the large field in the eastern most portion of the project area.**SPECIES LIST**

Scientific name	Common name	Stratum	Wetland indicator status	C†
<i>Solidago canadensis</i>	Canada goldenrod	herb	FACU	1
<i>Solidago gigantea</i>	late goldenrod	herb	FACW	3
<i>Stachys tenuifolia</i>	slenderleaf betony	herb	OBL	5
<i>Taraxacum officinale</i>	common dandelion	herb	FACU	*
<i>Toxicodendron radicans</i>	poison ivy	herb	FAC+	1
<i>Tridens flavus</i>	common purple top	herb	UPL	1
<i>Trifolium hybridum</i>	alsike clover	herb	FAC-	*
<i>Trifolium pratense</i>	red clover	herb	FACU+	*
<i>Trifolium repens</i>	white clover	herb	FACU+	*
<i>Ulmus pumila</i>	Siberian elm	shrub, herb	UPL	*
<i>Verbena hastata</i>	blue vervain	herb	FACW+	3
<i>Verbena urticifolia</i>	white vervain	herb	FAC+	3
<i>Verbesina alternifolia</i>	wingstem	herb	FACW	4
<i>Veronica peregrina</i>	purslane speedwell	herb	FACW+	0
<i>Viola pratincola</i>	common blue violet	herb	FAC	1
<i>Vitis riparia</i>	riverbank grape	herb	FACW-	2
<i>Xanthium strumarium</i>	cocklebur	herb	FAC	0

†Coefficient of Conservatism (Taft et al. 1997)

\*Non-native species

Percent native species = (73/113) \* 100 = 64.6%

 $\bar{C} = \sum C/N = 151/73 = 2.1$  $FQI = \sum C/\sqrt{N} = 151/\sqrt{73} = 17.7$ 

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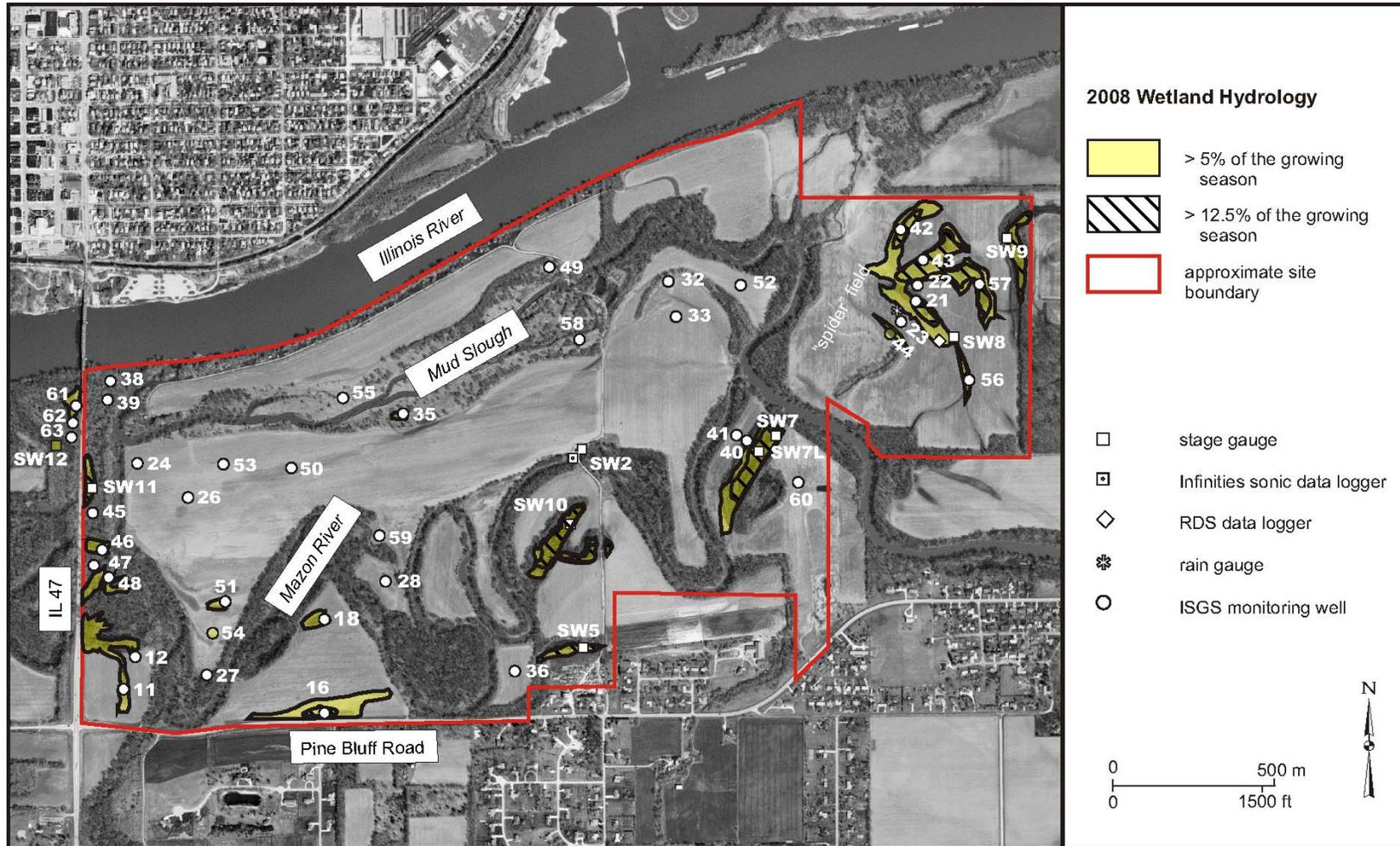
Keith Carr and Geoff Pociask (hydrology)  
 Illinois State Geological Survey  
 615 East Peabody Drive  
 Champaign, Illinois 61820

## **APPENDIX 4**

### **Hydrological Information**

**Morris, Illinois River Wetland Bank Site**  
**Estimated Areal Extent of 2008 Wetland Hydrology**  
 based on data collected between September 1, 2007 and October 8, 2008

Map based on USGS digital orthophotograph, Morris NE quarter quadrangle  
 from 4/5/1998 aerial photography (ISGS 2001)



## **APPENDIX 5**

### **Comprehensive Plant Species List for Non-Wetland Tree Planted Areas at the Morris Mitigation Bank**

**Appendix 5.** Comprehensive plant species list for all non-wetland tree planted areas at the Morris Mitigation Bank, 2008.

Scientific name	Common name	Stratum	Wetland indicator status	C†
<i>Abutilon theophrasti</i>	velvet-leaf	herb	FACU-	*
<i>Acer negundo</i>	box elder	shrub, herb	FACW-	1
<i>Acer saccharinum</i>	silver maple	shrub, herb	FACW	1
<i>Agropyron repens</i>	quack grass	herb	FACU	*
<i>Agrostis alba</i>	red top	herb	FACW	0
<i>Alliaria petiolata</i>	garlic mustard	herb	FAC	*
<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>Arctium minus</i>	common burdock	herb	UPL	*
<i>Asclepias syriaca</i>	common milkweed	herb	UPL	0
<i>Aster ericoides</i>	heath aster	herb	FACU-	4
<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>Atriplex patula</i>	fat-hen saltbush	herb	FACU+	*
<i>Bidens frondosa</i>	common beggar's ticks	herb	FACW	1
<i>Brassica kaber</i>	charlock	herb	UPL	0
<i>Brassica nigra</i>	black mustard	herb	UPL	*
<i>Bromus commutatus</i>	hairy brome	herb	UPL	*
<i>Bromus inermis</i>	awnless brome grass	herb	UPL	*
<i>Bromus japonicus</i>	Japanese brome	herb	FACU	*
<i>Calystegia sepium</i>	American bindweed	herb	FAC	1
<i>Capsella bursa-pastoris</i>	shepherd's-purse	herb	FAC-	*
<i>Carduus nutans</i>	musk bristle thistle	herb	UPL	*
<i>Carex</i> sp.	sedge	herb	----	--
<i>Carex conjuncta</i>	green-headed fox sedge	herb	FACW	5
<i>Carex grayi</i>	bur sedge	herb	FACW+	6
<i>Carex normalis</i>	sedge	herb	FACW	4
<i>Carex vulpinoidea</i>	fox sedge	herb	OBL	3
<i>Celtis occidentalis</i>	hackberry	shrub, herb	FAC-	3
<i>Cercis canadensis</i>	eastern redbud	shrub, herb	FACU	3
<i>Chaerophyllum procumbens</i>	wild chervil	herb	FAC+	1
<i>Chamaesyce maculata</i>	nodding spurge	herb	FACU-	0
<i>Chenopodium album</i>	lamb's quarters	herb	FAC-	*
<i>Cichorium intybus</i>	chickory	herb	UPL	*
<i>Cirsium arvense</i>	Canada thistle	herb	FACU	*
<i>Cirsium discolor</i>	pasture thistle	herb	UPL	3
<i>Cirsium vulgare</i>	bull thistle	herb	FACU-	*
<i>Conyza canadensis</i>	horseweed	herb	FAC-	0
<i>Cryptotaenia canadensis</i>	honestwort	herb	FAC	1
<i>Cynanchum laeve</i>	blue vine	herb	FAC	1
<i>Cyperus esculentus</i>	yellow nut-sedge	herb	FACW	0
<i>Cyperus strigosus</i>	straw-colored flatsedge	herb	FACW	0
<i>Dactylis glomerata</i>	orchard grass	herb	FACU	*

Species list continued on next page.

Appendix 5. *Continued.*

Scientific name	Common name	Stratum	Wetland indicator status	C†
<i>Daucus carota</i>	Queen Anne's lace	herb	UPL	*
<i>Dipsacus laciniatus</i>	cut-leaved teasel	herb	UPL	*
<i>Echinochloa muricata</i>	barnyard grass	herb	OBL	0
<i>Elaeagnus umbellata</i>	autumn olive	shrub	UPL	*
<i>Elymus canadensis</i>	Canada wild rye	herb	FAC-	4
<i>Elymus virginicus</i>	Virginia wild rye	herb	FACW-	4
<i>Erigeron annuus</i>	annual fleabane	herb	FAC-	1
<i>Erigeron strigosus</i>	daisy fleabane	herb	FAC-	2
<i>Eupatorium rugosum</i>	white snakeroot	herb	FACU	2
<i>Eupatorium serotinum</i>	late boneset	herb	FAC+	1
<i>Festuca pratensis</i>	meadow fescue	herb	FACU-	*
<i>Fraxinus pennsylvanica</i>	green ash	shrub, herb	FACW	2
<i>Geum canadense</i>	white avens	herb	FAC	2
<i>Geum laciniatum</i>	rough avens	herb	FACW	2
<i>Glechoma hederacea</i>	ground ivy	herb	FACU	*
<i>Gleditsia triacanthos</i>	honey locust	shrub, herb	FAC	2
<i>Helenium autumnale</i>	autumn sneezeweed	herb	FACW+	3
<i>Helianthus tuberosus</i>	Jerusalem artichoke	herb	FAC	3
<i>Hordeum jubatum</i>	squirrel-tail	herb	FAC+	*
<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>	wild sweet potato vine	herb	FACU	2
<i>Juglans nigra</i>	black walnut	shrub, herb	FACU	4
<i>Lactuca floridana</i>	blue lettuce	herb	FAC-	4
<i>Lactuca saligna</i>	willow-leaved lettuce	herb	FACU	*
<i>Lactuca serriola</i>	prickly lettuce	herb	FAC	*
<i>Laportea canadensis</i>	wood nettle	herb	FACW	2
<i>Leersia virginica</i>	white grass	herb	FACW	4
<i>Leonurus marrubiastrum</i>	lion's-tail	herb	UPL	*
<i>Lepidium virginicum</i>	common peppergrass	herb	FACU-	0
<i>Lolium perenne</i>	crested rye grass	herb	FACU	*
<i>Lonicera maackii</i>	Amur honeysuckle	shrub	UPL	*
<i>Lotus corniculatus</i>	birdsfoot-trefoil	herb	FAC-	*
<i>Lysimachia nummularia</i>	moneywort	herb	FACW+	*
<i>Medicago lupulina</i>	black medic	herb	FAC-	*
<i>Medicago sativa</i>	alfalfa	herb	UPL	*
<i>Melilotus alba</i>	white sweet clover	herb	FACU	*
<i>Melilotus officinalis</i>	yellow sweet clover	herb	FACU	*
<i>Mollugo verticillata</i>	carpetweed	herb	FAC	*
<i>Morus alba</i>	white mulberry	shrub, herb	FAC	*
<i>Muhlenbergia frondosa</i>	common satin grass	herb	FACW	3
<i>Muhlenbergia schreberi</i>	nimble will	herb	FAC	0
<i>Oenothera biennis</i>	evening primrose	herb	FACU	1
<i>Oxalis stricta</i>	yellow wood sorrel	herb	FACU	0
<i>Panicum dichotomiflorum</i>	fall panicum	herb	FACW-	0
<i>Panicum virgatum</i>	prairie switchgrass	herb	FAC+	4
<i>Parthenocissus quinquefolia</i>	Virginia creeper	herb	FAC-	2

*Species list continued on next page.*

Appendix 5. *Continued.*

Scientific name	Common name	Stratum	Wetland indicator status	C†
<i>Pastinaca sativa</i>	parsnip	herb	UPL	*
<i>Phalaris arundinacea</i>	reed canary grass	herb	FACW+	*
<i>Phleum pratense</i>	Timothy	herb	FACU	*
<i>Phyla lanceolata</i>	fog-fruit	herb	OBL	1
<i>Physalis subglabrata</i>	smooth ground cherry	herb	UPL	0
<i>Pilea pumila</i>	Canada clearweed	herb	FACW	3
<i>Plantago lanceolata</i>	narrow-leaved plantain	herb	FAC	*
<i>Plantago rugelii</i>	red-stalked plantain	herb	FAC	0
<i>Poa compressa</i>	Canadian bluegrass	herb	FACU+	*
<i>Poa pratensis</i>	Kentucky bluegrass	herb	FAC-	*
<i>Polygonum amphibium</i>	water smartweed	herb	OBL	3
<i>Polygonum aviculare</i>	knotweed	herb	FAC-	*
<i>Polygonum lapathifolium</i>	curttop lady's thumb	herb	FACW+	0
<i>Polygonum pensylvanicum</i>	giant smartweed	herb	FACW+	1
<i>Polygonum scandens</i>	climbing buckwheat	herb	FAC	2
<i>Populus deltoides</i>	eastern cottonwood	shrub, herb	FAC+	2
<i>Potentilla norvegica</i>	rough cinquefoil	herb	FAC	0
<i>Prunella vulgaris</i>	self-heal	herb	FAC	*
<i>Ptelea trifoliata</i>	wafer ash	shrub	FACU+	4
<i>Ranunculus abortivus</i>	little-leaf buttercup	herb	FACW-	1
<i>Rorippa islandica</i>	marsh yellow cress	herb	OBL	4
<i>Rorippa sylvestris</i>	creeping yellow cress	herb	OBL	*
<i>Rosa multiflora</i>	multiflora rose	shrub	FACU	*
<i>Rubus occidentalis</i>	black raspberry	shrub	UPL	2
<i>Rudbeckia laciniata</i>	cutleaf coneflower	herb	FACW+	3
<i>Rudbeckia triloba</i>	brown-eyed Susan	herb	FAC-	3
<i>Rumex altissimus</i>	pale dock	herb	FACW-	2
<i>Rumex crispus</i>	curly dock	herb	FAC+	*
<i>Salix amygdaloides</i>	peach-leaved willow	shrub, herb	FACW	4
<i>Salix exigua</i>	sandbar willow	shrub, herb	OBL	1
<i>Salix nigra</i>	black willow	shrub, herb	OBL	3
<i>Sambucus canadensis</i>	common elder	shrub, herb	FACW-	2
<i>Sanicula gregaria</i>	common snakeroot	herb	FAC+	2
<i>Setaria faberi</i>	giant foxtail	herb	FACU+	*
<i>Setaria glauca</i>	pigeon grass	herb	FAC	*
<i>Setaria verticillata</i>	bristly foxtail	herb	FAC	*
<i>Setaria viridis</i>	common foxtail	herb	UPL	*
<i>Setaria viridis</i> var. <i>major</i>	tall green foxtail	herb	UPL	*
<i>Sicyos angulatus</i>	bur cucumber	herb	FACW-	3
<i>Sida spinosa</i>	prickly sida	herb	FACU	*
<i>Silphium perfoliatum</i>	cup plant	herb	FACW-	4
<i>Smilax hispida</i>	bristly greenbrier	herb	FAC	3
<i>Solanum carolinense</i>	horse nettle	herb	FACU-	0
<i>Solanum dulcamara</i>	false bittersweet	herb	FAC	*
<i>Solidago canadensis</i>	Canada goldenrod	herb	FACU	1
<i>Solidago gigantea</i>	late goldenrod	herb	FACW	3
<i>Sonchus arvensis</i>	field sowthistle	herb	FAC-	*

*Species list continued on next page.*

Appendix 5. *Continued.*

Scientific name	Common name	Stratum	Wetland indicator status	C†
<i>Taraxacum officinale</i>	common dandelion	herb	FACU	*
<i>Teucrium canadense</i>	American germander	herb	FACW-	3
<i>Thlaspi arvense</i>	field penny cress	herb	UPL	*
<i>Toxicodendron radicans</i>	poison ivy	herb	FAC+	1
<i>Tragopogon dubius</i>	goat's beard	herb	UPL	*
<i>Trifolium hybridum</i>	alsike clover	herb	FAC-	*
<i>Trifolium pratense</i>	red clover	herb	FACU+	*
<i>Trifolium repens</i>	white clover	herb	FACU+	*
<i>Ulmus americana</i>	American elm	shrub, herb	FACW-	5
<i>Ulmus pumila</i>	Siberian elm	shrub, herb	UPL	*
<i>Ulmus rubra</i>	slippery elm	shrub, herb	FAC	3
<i>Urtica dioica</i>	stinging nettle	herb	FAC+	2
<i>Verbena urticifolia</i>	white vervain	herb	FAC+	3
<i>Viola pratincola</i>	common blue violet	herb	FAC	1
<i>Vitis riparia</i>	riverbank grape	herb	FACW-	2
<i>Xanthium strumarium</i>	cocklebur	herb	FAC	0

†Coefficient of Conservatism (Taft et al. 1997)

\*Non-native species

Percent native species = (93/155) \* 100 = 60%

$$\bar{C} = \sum C/N = 180/93 = 1.9$$

$$FQI = \sum C / \sqrt{N} = 180/\sqrt{93} = 18.7$$

**APPENDIX 6**

**Photographs of Planned Wetlands**



**Photograph 1.** Planned wetland A.



**Photograph 2.** Planned wetland B.



**Photograph 3.** Planned wetland C.



**Photograph 4.** Planned wetland D.



**Photograph 5.** Planned wetland E.



**Photograph 6.** Planned wetland F.



**Photograph 7.** Planned wetland G.



**Photograph 8.** Planned wetland H



**Photograph 9.** Planned wetland I.



**Photograph 10.** Planned wetland J.



**Photograph 11.** Planned wetland K.