

# Wetland Mitigation Monitoring Report



Project Site:

The Morris Wetland Mitigation Bank  
Grundy County, Illinois

IDOT Sequence Number: 1306



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## Project Summary

A mitigation monitoring survey was conducted at the Morris Wetland Mitigation Bank in Grundy County, Illinois, on 18, 27, and 28 September 2012. This site has been monitored by the Illinois Natural History Survey (INHS) since 2004. Introductory information, historical and current project goals, objectives, performance criteria, methods, and results are presented in this report, followed by discussion and recommendations. During this long-term monitoring, one site, planned wetland K, has consistently exhibited jurisdictional wetland characteristics as defined by current federal standards. The rest of the areas do not meet these wetland criteria. Wetland determinations are no longer performed in areas, except for planned wetland K. While quantitative vegetative assessments used to be performed in all areas, tree counting has been discontinued for a general assessment of the floristic changes in these areas, including dominant species, non-native species occurrence, and volunteer tree recruitment. Wetland determination results and a printout of the digital orthophoto quadrangle (DOQ) showing planned and actual wetland boundaries and sampling points are included. Wetland determination forms can be found in Appendix A, wetland plant species list in Appendix B, figures in Appendix C, and photographs in Appendix D.

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*Cover Photo: Overlooking planned wetland K-1, facing north.*

# The Morris Wetland Mitigation Bank

## Grundy County, Illinois

### **Introduction**

Mitigation monitoring was conducted on 18, 27 and 28 September 2012, at Morris Wetland Mitigation Bank. The Morris Wetland Bank is located near Morris, Illinois, in Grundy County and is immediately east of IL Route 47 and south of the Illinois River (Appendix C: Figure 1). The site lies within the Upper Illinois River watershed (Hydrologic Unit Code 07120005). More information about the site can be found in the Wetland Bank Prospectus: Morris Site prepared by the Illinois Department of Transportation (IDOT) (Brooks 2000). In 2009, ownership of the Morris Wetland Bank was transferred from IDOT to the Illinois Department of Natural Resources (IDNR).

This site has been monitored by the Illinois Natural History Survey (INHS) since 2004. 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. 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 (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 C: Figure 2). Prior to 2012, the site has been monitored on the following dates: 5-6 July and 27 September 2005, 26-27 July 2006, 27-28 September and 4-5 October 2007, 15-16 October 2008, and 4 August, 13-14 October 2009 and September 1 and 21, 2011. INHS personnel submitted annual monitoring reports to IDOT for each year since monitoring began (Feist et al. 2005, Feist et al. 2006, Feist et al. 2007, Wilm et al. 2008, Feist et al. 2009, Feist 2010, Feist et al. 2011, and Feist et al. 2012). These reports discussed the goals, objectives, and performance criteria for the wetland bank, the methods used for monitoring the site, monitoring results, and recommendations for management of the site.

The site was monitored again in September 2012 and the results of this monitoring are discussed in this report. This report discusses the goals, objectives, and performance criteria for the mitigation project, the methods used for monitoring the site, monitoring results, and discussion and recommendations based on the results. Methods and results are discussed by performance criterion for each goal.

### **Goals, Objectives, and Performance Criteria**

Goals, objectives, and performance criteria for the Morris Wetland Mitigation Bank follow those specified in the Wetland Bank Prospectus (Brooks 2000) developed for this site. Performance criteria were based on those specified in the *Corps of Engineers Wetlands Delineation Manual* (Environmental Laboratory 1987) and in *Guidelines for Developing Mitigation Proposals* (USACE 1993). One goal with two objectives was to be attained by the end of the initial five-year monitoring period. The goal, objectives, and performance criteria are listed below.

**Project goal:** The goal of this wetland restoration project was to create one continuous tract of floodplain forest within the Morris Mitigation Bank. To this effect, 109 acres of wetland restoration area were planted with native trees and shrubs in 11 different planned wetlands (A-K) [Appendix C: Figure 2].

**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 at each sampling location.
- b. Presence of wetland hydrology: The planned wetlands must be inundated at average depths less than 2 m (6.6 ft) or have soils that are saturated to the surface for at least 14 consecutive days of the growing season in at least 5 of 10 years on average.
- c. Presence of hydric soils: Hydric soil characteristics should be present, or conditions favorable for hydric soil formation should persist at the site. Favorable conditions include inundation or saturation to within 12 inches of the surface.

**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 either site should be non-native or weedy species, such as cattails (*Typha* spp.), sandbar willow (*Salix interior*), or reed canary grass (*Phalaris arundinacea*).

After the five-year monitoring period ended, the Corps of Engineers granted IDOT mitigation credits for the restoration of 109 acres of planned wetlands within the Morris Wetland Bank. There has been an agreement to continue to monitor these 109 acres until the time when all mitigation credits have been used. A new plan has been developed for the continued monitoring of the planned wetlands. This plan is outlined below.

**Revised Monitoring Plan for the Morris Wetland Bank**

**1) Assessment of Vegetation:** INHS personnel will visit the Morris Wetland Bank every year beginning in September 2011. Each planned wetland will be visited and the following will be assessed:

- A. Planted and Volunteer Trees** - INHS personnel will continue to monitor tree survival within the planned wetland areas (**Objective 2, performance criterion a**); however, instead of counting each individual tree, we will visually inspect the site and report on

the condition of the planted trees within each planned wetland. We will also report on the establishment of volunteer trees within the planned wetlands.

- B. Dominant and Invasive Species** - The floristic composition and vegetation cover of the planned wetlands will continue to be monitored (**Objective 2**). INHS personnel will assess the quality of the vegetation within the planned wetland areas. We will note the dominant species at each planned wetland (**performance criterion b**) and we will report on any non-native and/or invasive species that are present in significant numbers at a site (**performance criterion c**).

**2) Wetland Determination:** INHS personnel will continue to conduct a wetland determination at planned wetland K to monitor the progress of wetland development at this site. The performance criteria under **Objective 1** will continue to be evaluated for planned wetland K utilizing the methods as outlined in Feist et al. (2010). Planned wetland K is the only site that has had a significant amount of wetland acreage (> 1 ac) present throughout all of the years of monitoring. It is also the only site in which Illinois State Geological Survey (ISGS) personnel still maintain an active on-site data logger (Appendix C: Figure 3) to monitor hydrology.

### Methods

The methods of the vegetation assessment and wetland determination are given below.

#### **1) Assessment of Vegetation:**

INHS personnel visually inspected the site to note the floristic composition and vegetative cover of the planned wetlands. An assessment of the condition of the planted trees within each planned wetland, the establishment of volunteer trees within the planned wetlands, dominant species at each planned wetland, and any non-native and/or invasive species present in significant numbers at a site, are provided in the results section of this report.

#### **2) Wetland Determination:**

Wetland determinations were conducted using definitions and guidelines established in the *Corps of Engineers Wetlands Delineation Manual* (Environmental Laboratory 1987) and the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Midwest Region (Version 2.0)* (USACE 2010). Data from these determinations were recorded on U.S. Army Corps of Engineers' Wetland Determination Data Forms – Midwest Region (Appendix A); a data form was completed for each wetland sampling point.

Characteristics of vegetation, soils, hydrology, and topography were evaluated during field investigation and on-site wetland determination. Determining predominance of hydrophytic vegetation is based on aerial coverage estimates for individual plant species. Each of the dominant plant species is then assigned its wetland indicator status rating (Lichvar and Kartesz 2009). Any plant rated facultative or wetter (FAC, FACW, or OBL) is considered a hydrophyte. A predominance of wetland vegetation in the plant community exists if more than 50% of the dominant species present are hydrophytic. Predominance of hydrophytic vegetation was

determined at the sampling point level as part of the routine wetland determination procedure. Site-wide dominant species were estimated visually, and are noted in the site species list.

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

Illinois State Geological Survey (ISGS) personnel are responsible for monitoring site hydrology. Past hydrological monitoring involved a Level II hydrogeologic characterization of the Morris Wetland Mitigation site. In 2009, IDOT requested that the extent of hydrology monitoring be limited to an off-site USACE river gauge and two on-site data loggers to measure surface water inundation. These surface water gauges are in Planned Wetland K. In addition, there is a rain gauge in vicinity to Planned Wetland K. More detailed information about hydrologic monitoring methodology can be found in the ISGS *Annual Report for Active IDOT Wetland Mitigation and Hydrologic Monitoring Sites* (Miner et al. 2012).

## **Results**

The results of the vegetation assessment and wetland determination are given below.

**1) Assessment of Vegetation:** INHS personnel visited each planned wetland (A-K) during September 2012 and the vegetation was assessed. A photo of each planned wetland is included in Appendix D. The results of these assessments are given below. The following abbreviations or symbols are used: h = herb, s = sapling, t = tree. \* = non-native.

### **Planned Wetland A**

**Dominant species:** Virginia wild rye (*Elymus virginicus*)(h), Kentucky blue grass \*(*Poa pratensis*)(h), Canada goldenrod (*Solidago canadensis*)(h), green ash (*Fraxinus lanceolata*)(s), Siberian elm\*(*Ulmus pumila*)(s,t)

**Invasive species:** Siberian elm\*(*Ulmus pumila*)(s,t) is common at this site.

**Planted and volunteer tree species:** Percent survival of planted trees at this site in 2009 (Feist et al. 2010) was 82.3%. A good variety of planted tree and shrub species continue to thrive at this site. In addition, a number of native volunteer tree species have now become established. Black walnut (*Juglans nigra*), box elder (*Acer negundo*), honey locust (*Gleditsia triacanthos*), eastern cottonwood (*Populus deltoides*), and American elm (*Ulmus americana*) are occasional. Green ash (*Fraxinus lanceolata*) saplings are abundant at this site.

**Additional comments:** A number of trees at this site still have wire beaver guards surrounding them. It is recommended that the beaver guards be removed as they are currently restricting the growth of these trees.

### Planned Wetland B

**Dominant species:** Virginia wild rye (*Elymus virginicus*)(h), giant foxtail\* (*Setaria faberi*)(h), panicked aster (*Aster lanceolatus*)(h), Kentucky blue grass \*(*Poa pratensis*)(h), smartweed (*Persicaria punctata*)(h)

**Invasive species:** Siberian elm\* (*Ulmus pumila*)(s,t) is occasional at this site.

**Planted and volunteer tree species:** Percent survival of planted trees at this site in 2009 (Feist et al. 2010) was 112.8%. A good variety of planted tree and shrub species continue to thrive at this site. Green ash (*Fraxinus lanceolata*) is common at the site. Honey locust (*Gleditsia triacanthos*) are occasional volunteers.

**Additional comments:** A number of trees at this site still have wire beaver guards surrounding them. It is recommended that the beaver guards be removed as they are currently restricting the growth of these trees.

### Planned Wetland C

**Dominant species:** Virginia wild rye (*Elymus virginicus*)(h), Kentucky blue grass \*(*Poa pratensis*)(h)

**Invasive species:** Siberian elm\* (*Ulmus pumila*)(s,t), reed canary grass\* (*Phalaris arundinacea*)(h), and field thistle\*(*Cirsium arvense*)(h) are occasional at this site.

**Planted and volunteer tree species:** Percent survival of planted trees at this site in 2009 (Feist et al. 2010) was 81%. A good variety of planted tree and shrub species continue to thrive at this site. In addition, a number of native volunteer tree species have now become established. Green ash (*Fraxinus lanceolata*) saplings are common at the site. Box elder (*Acer negundo*), silver maple (*Acer saccharinum*), hackberry (*Celtis occidentalis*), and honey locust (*Gleditsia triacanthos*) are occasional.

**Additional comments:** Many trees at this site, especially on the easternmost side, still have wire beaver guards surrounding them. It is recommended that the beaver guards be removed as they are currently restricting the growth of these trees.

### Planned Wetland D

**Dominant species:** Canada goldenrod (*Solidago canadensis*)(h), hairy aster (*Aster pilosus*)(h), cutleaf coneflower (*Rudbeckia laciniata*)(h), reed canary grass\* (*Phalaris arundinacea*)(h), and field thistle\*(*Cirsium arvense*)(h)

**Invasive species:** Reed canary grass\* (*Phalaris arundinacea*)(h), and field thistle\*(*Cirsium arvense*)(h) are common at this site.

**Planted and volunteer tree species:** Percent survival of planted trees at this site in 2009 (Feist et al. 2010) was 54%. A variety of planted tree and shrub species are present at this site, however, overall survival is low, except for sycamore (*Platanus occidentalis*). A number of native volunteer tree species have become established at the site. Honey locust (*Gleditsia triacanthos*) is common. Silver maple (*Acer saccharinum*), hackberry (*Celtis occidentalis*), and black walnut (*Juglans nigra*) are occasional.

### Planned Wetland E

**Dominant species:** Canada goldenrod (*Solidago canadensis*)(h), hairy aster (*Aster pilosus*)(h), stinging nettle (*Urtica gracilis*)(h) Virginia wild rye (*Elymus virginicus*)(h), reed canary grass\* (*Phalaris arundinacea*)(h), and field thistle\* (*Cirsium arvense*)(h)

**Invasive species:** Reed canary grass\* (*Phalaris arundinacea*)(h), and field thistle\* (*Cirsium arvense*)(h) are common at this site.

**Planted and volunteer tree species:** Percent survival of planted trees at this site in 2009 (Feist et al. 2010) was 51.3%. A variety of planted tree and shrub species are present at this site, however, overall survival is low. A few native volunteer tree species have become established. Green ash (*Fraxinus lanceolata*), hackberry (*Celtis occidentalis*), and honey locust (*Gleditsia triacanthos*) are occasional at the site.

**Additional comments:** Some trees at this site still have wire beaver guards surrounding them. It is recommended that the beaver guards be removed as they are currently restricting the growth of these trees.

### Planned Wetland F

**Dominant species:** Giant ragweed (*Ambrosia trifida*)(h) and Virginia wild rye (*Elymus virginicus*)(h)

**Invasive species:** None are present in significant numbers.

**Planted and volunteer tree species:** Percent survival of planted trees at this site in 2009 (Feist et al. 2010) was 45.5%. A variety of planted tree and shrub species are present at this site, however, overall survival is low. Some native volunteer trees have become established. Box elder (*Acer negundo*) and green ash (*Fraxinus lanceolata*) are occasional at the site.

**Additional comments:** Large, nearly impenetrable patches of giant ragweed (*Ambrosia trifida*) occur throughout this site.

### Planned Wetland G

**Dominant species:** Canada goldenrod (*Solidago canadensis*)(h), hairy aster (*Aster pilosus*)(h), Japanese chess\* (*Bromus japonicas*)(h), giant ragweed (*Ambrosia trifida*)(h), Virginia wild rye (*Elymus virginicus*)(h), *Aster pilosus* (h), and field thistle\* (*Cirsium arvense*)(h)

**Invasive species:** Japanese chess\* (*Bromus japonicas*)(h) and field thistle\* (*Cirsium arvense*)(h) are common at this site. Siberian elm\* (*Ulmus pumila*)(s,t) is occasional.

**Planted and volunteer tree species:** Percent survival of planted trees at this site in 2009 (Feist et al. 2010) was 75.4%. A good variety of planted tree and shrub species are present at this site. A number of native volunteer trees have become established. Box elder (*Acer negundo*) and green ash (*Fraxinus lanceolata*) are occasional at the site.

### Planned Wetland H

**Dominant species:** Reed canary grass\* (*Phalaris arundinacea*)(h), Canada goldenrod (*Solidago canadensis*)(h), Kentucky blue grass\* (*Poa pratensis*)(h), honey locust (*Gleditsia triacanthos*)(s), and field thistle\* (*Cirsium arvense*)(h)

**Invasive species:** Reed canary grass\* (*Phalaris arundinacea*)(h), and field thistle\*(*Cirsium arvense*)(h) are common at this site. Autumn olive\*(*Elaeagnus umbellata*)(s,t) is infrequent throughout the site.

**Planted and volunteer tree species:** Percent survival of planted trees at this site in 2009 (Feist et al. 2010) was 46.3%. A variety of planted tree and shrub species are present at this site, however, overall survival is low. A few native volunteer trees have become established at this site. Species present include green ash (*Fraxinus lanceolata*), hackberry (*Celtis occidentalis*), honey locust (*Gleditsia triacanthos*) and eastern cottonwood (*Populus deltoides*).

**Additional comments:** Some trees at this site still have wire beaver guards surrounding them. It is recommended that the beaver guards be removed as they are currently restricting the growth of these trees.

#### Planned Wetland I

**Dominant species:** Canada goldenrod (*Solidago canadensis*)(h), Virginia wild rye (*Elymus virginicus*)(h), hairy aster (*Aster pilosus*)(h)

**Invasive species:** Reed canary grass\* (*Phalaris arundinacea*)(h), field thistle\*(*Cirsium arvense*)(h) and Siberian elm\* (*Ulmus pumila*)(s,t) are occasional.

**Planted and volunteer tree species:** Percent survival of planted trees at this site in 2009 (Feist et al. 2010) was 66.3%. A variety of planted tree and shrub species are present at this site, however, overall survival is somewhat low. A number of native volunteer tree species have become established. Silver maple (*Acer saccharinum*), hackberry (*Celtis occidentalis*), black walnut (*Juglans nigra*), green ash (*Fraxinus lanceolata*), honey locust (*Gleditsia triacanthos*), eastern cottonwood (*Populus deltoides*) and box elder (*Acer negundo*) are occasional at the site.

**Additional comments:** Some trees at this site still have wire beaver guards surrounding them. It is recommended that the beaver guards be removed as they are currently restricting the growth of these trees.

#### Planned Wetland J

**Dominant species:** Canada goldenrod (*Solidago canadensis*)(h), reed canary grass\* (*Phalaris arundinacea*)(h), cutleaf coneflower (*Rudbeckia laciniata*)(h)

**Invasive species:** Reed canary grass\* (*Phalaris arundinacea*) is common throughout the site. Field thistle\*(*Cirsium arvense*) is occasional at this site.

**Planted and volunteer tree species:** Percent survival of planted trees at this site in 2009 (Feist et al. 2010) was 47.5%. A variety of planted tree and shrub species are present at this site, however, overall survival is low. A number of native volunteer tree species have become established. Box elder (*Acer negundo*), silver maple (*Acer saccharinum*), green ash (*Fraxinus lanceolata*), black walnut (*Juglans nigra*), and eastern cottonwood (*Populus deltoides*) are occasional at the site.

**Additional comments:** Some trees at this site still have wire beaver guards surrounding them. It is recommended that the beaver guards be removed as they are currently restricting the growth of these trees.

## Planned Wetland K

**Dominant species:** False aster (*Boltonia asteroides*)(h), spiny barnyard grass (*Echinochloa muricata*) (h), reed canary grass\* (*Phalaris arundinacea*)(h), common beggar's tick (*Bidens frondosa*)(h), Canada goldenrod (*Solidago canadensis*)(h), Kentucky blue grass \*(*Poa pratensis*)(h), Hungarian brome (*Bromus inermis*)(h), and pigeon grass\* (*Setaria glauca*) (h)

**Invasive species:** Reed canary grass\* (*Phalaris arundinacea*)(h) is a dominant in a portion of the wetland area. Siberian elm\* (*Ulmus pumila*)(s,t)are occasional throughout this site.

**Planted and volunteer tree species:** Percent survival of planted trees at this site in 2009 (Feist et al. 2010) was 51%. A variety of planted tree and shrub species are present at this site, however, overall survival is low. Large areas within this site that are frequently inundated have almost 0% survival of planted trees. A number of native volunteer tree species have become established at the site. Box elder (*Acer negundo*), silver maple (*Acer saccharinum*), honey locust (*Gleditsia triacanthos*), and black willow (*Salix nigra*) are occasional. Green ash (*Fraxinus lanceolata*) and eastern cottonwood (*Populus deltoides*) are common.

**Additional comments:** See 2) below and Appendices A and B for additional information regarding the wetland determination.

**2) Wetland Determination:** Site K was visited on 18 September 2012 and an on-site wetland determination was performed (Appendix A). According to the results of this visit and hydrological information provided by ISGS personnel (Miner et al. 2012) approximately 10.56 ac met the three criteria of a wetland in 2012. A wetland determination form and wetland species list are listed in Appendices A and B, respectively. The portion of the planned wetland that meets the three criteria of a wetland is K-1; the portion that does not meet the three criteria is K-2 (Appendix C: Figure 2).

a. Occurrence of hydric soils

Soils examined were found to be relatively undisturbed and hydric soil indicators are present in the site. A soil description of a typical pedon located within the site can be found on the data forms in Appendix A.

b. Presence of Wetland Hydrology

The ISGS estimated that the area that satisfied the wetland hydrology criteria for more than 5% of the 2012 growing season was 6.18 ha (15.28 ac), (Miner et al. 2012). The total area that satisfied the wetland hydrology criteria for more than 12.5% of the 2012 growing season was 0.45 ha (1.13 ac). Using the 2010 Midwest Regional Supplement (USACE 2010) to the 1987 Manual, 4.27 ha (10.56 ac) satisfied the wetland hydrology criteria for 14 or more consecutive days during the growing season. More detailed hydrologic information can be found in the ISGS *Annual Report for Active IDOT Wetland Mitigation and Hydrologic Monitoring Sites* (Miner et al. 2012).

## Discussion

The eighth year of field monitoring of the Morris Wetland Mitigation Bank in Grundy County, Illinois was conducted during September 2012. Throughout this long-term monitoring since 2004 (there was no monitoring done in 2010), one site, planned wetland K, has consistently exhibited jurisdictional wetland characteristics as defined by current federal standards. The rest of the areas at the mitigation bank do not meet these wetland criteria. Wetland determinations are no longer performed in areas, except for planned wetland K. Site K is the only site that has had a significant amount of wetland acreage (> 1 ac) present over the past seven years of monitoring. It is also the only site in which Illinois State Geological Survey (ISGS) personnel still maintain an active on-site data loggers (Appendix C: Figure 3) to monitor hydrology.

ISGS personnel reported that a much larger portion of the Morris Wetland Bank site satisfied the wetland hydrology criteria in 2011 than in previous years (Miner et al. 2011). A total of 142.4 ac satisfied the wetland hydrology criteria for greater than 5% of the growing season for 2011. For the 2012 growing season, ISGS estimated that the area that satisfied the wetland hydrology criteria for more than 5% of the 2012 growing season was considerably less at 15.28 ac (Miner et al. 2012).

Wetland mitigation sites are monitored for a number of years and an area must satisfy the wetland criteria for a majority of the years monitored to be considered wetland. Because 2011 had unusual and rare flooding events, and 2012 had an unusually severe drought, it does not affect the overall amount of wetland that occurs throughout the Morris Wetland Bank. Much of Site K, however, has met wetland hydrology for the majority of years monitored (Feist et al. 2010) and so the area outlined as K-1 (Appendix A: Figure 2) is considered to be wetland.

While quantitative vegetative assessments used to be performed throughout the Morris Wetland Bank site, tree counting had been discontinued for a general assessment of the floristic changes in these areas, including dominant species, non-native species occurrence, and volunteer tree recruitment. All sites had at least one dominant species that is considered non-native or weedy. There are several invasive species present at the site that must be noted and may be in need of control. Reed canary grass (*Phalaris arundinacea*), field thistle (*Cirsium arvense*), and Siberian elm (*Ulmus pumila*) are three aggressive, exotic, invasive species that occur within the planned wetlands. Non-native, invasive species like reed canary grass are likely to persist and expand in these sites until planted trees begin to mature and effectively shade out this understory vegetation. Past extensive mowing of the site had delayed the establishment of perennial native non-weedy species at the site. Mowing was discontinued prior to the 2011 field monitoring survey. Now that mowing has been decreased at the site, it is expected that due to natural succession, that tree species will now have the opportunity to become established and contribute to the goal of creating floodplain forest at the site. Natural community development may enable favorable dominant species to become prevalent over time.

In 2009, tree survival at all sites combined was 63.3% of the original 7635 planted trees. This was down by just 0.1% from the 63.4% reported from 2008 (Feist et al. 2010). In 2011, Feist et al. reported that although the trees were not counted, overall survival appeared to be about the same as in 2009. For 2012, overall survival appears to be about the same as the previous year to slightly higher percentage of trees established. The severe drought in this area for part of 2012 could have contributed to this (U.S. Drought Monitor, 2012). Although the 63.3% survival rate from 2009 is well below the required 80% survival rate, there are a number of native volunteer tree species that are now becoming established at the site. These include box elder (*Acer negundo*), silver maple (*Acer saccharinum*), green ash (*Fraxinus lanceolata*), honey locust (*Gleditsia triacanthos*), black walnut (*Juglans nigra*), and eastern cottonwood (*Populus deltoids*). In the future there might be a need to control the non-native tree Siberian Elm (*Ulmus pumila*) recruitment at some sites.

In 2009, ownership of the Morris Wetland Bank was transferred from IDOT to the Illinois Department of Natural Resources (IDNR). As a result, IDNR now allows whitetail deer hunting at the site. Archery deer hunting is ongoing at the site from October through January every year. There were a few trees noted to have deer rubs. Presumably, deer hunting would decrease the amount of trees lost to buck rubs, as well as saplings consumed by deer.

A considerable number of planted trees at this site still have wire beaver guards surrounding them. It is recommended that the beaver guards be removed as they are currently restricting the growth and survival rate of these trees.

Although only a small amount of wetland has been restored at the Morris Wetland Mitigation Bank, this site is progressing toward the creation of one continuous tract of forest within the mitigation bank. Tree species are becoming established at the site, however herbaceous, weedy and non-native species continue to be a concern. As shading increases and mowing remains minimal, the herbaceous vegetation at the site will continue to change and perennial and non-weedy species would ideally become established.

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**APPENDIX A**

**Wetland Determination Forms**

### WETLAND DETERMINATION DATA FORM - Midwest Region

Project/Site: The Morris Wetland Bank City/County: Grundy Sampling Date 9/18/2012  
 Applicant/Owner: IDOT District 3 State: IL Sampling Point K1-A  
 Investigator(s): Nieset and Geatz Section, Township, Range: Sec 11, T33, R7E  
 Landform (hillslope, terrace, etc.): Floodplain Local relief (concave, convex, none): None to Concave  
 Slope (%): <1 Lat: 41.35653 Long: -88.39349 Datum: NAD 83  
 Soil Map Unit Name: Sawmill SICL, 0-2% slopes, frequently flooded NWI classification: U  
 Are climatic/hydrologic conditions on the site typical for this time of year? No (If no explain in Remarks.)  
 Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes  
 Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

**SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.**

Hydrophytic Vegetation Present? <u>Yes</u> Hydric Soil Present? <u>Yes</u> Wetland Hydrology Present? <u>No</u>	<b>Is the Sampled Area within a Wetland?</b> <u>No</u>
Remarks: Community type is non-native grassland.  According to the U.S. Drought Monitor, this area of the state experienced a severe drought for a portion of the year.	

**VEGETATION -Use scientific names of plants.**

	Absolute % Cover	Dominant Species?	Indicator Status	
<b>Tree Stratum</b> (Plot size: <u>30 ft radius</u> )				
1. _____				<b>Dominance Test worksheet:</b> Number of Dominant Species That are OBL, FACW, or FAC: _____ (A) Total Number of Dominant Species Across All Strata: _____ (B) Percent of Dominant Species That are OBL, FACW, or FAC: _____ (A/B)
2. _____				
3. _____				
4. _____				
5. _____				
_____ = Total Cover				
<b>Sapling/Shrub Stratum</b> (Plot size: <u>15 ft radius</u> )				
1. <u>Fraxinus lanceolata</u>	4	No	FACW	<b>Prevalence Index worksheet:</b> Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals _____ (A) _____ (B) Prevalence Index =B/A = _____
2. _____				
3. _____				
4. _____				
5. _____				
_____ = Total Cover				
<b>Herb Stratum</b> (Plot size: <u>5 ft radius</u> )				
1. <u>Phalaris arundinacea</u>	89	Yes	FACW	<b>Hydrophytic Vegetation Indicators</b> <input checked="" type="checkbox"/> 1-Rapid Test for Hydrophytic Vegetation <input type="checkbox"/> 2-Dominance Test is >50% <input type="checkbox"/> 3-Prevalence Index is < or =3.0 <sup>1</sup> <input type="checkbox"/> 4-Morphological Adaptations <sup>1</sup> (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)  <sup>1</sup> Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
2. <u>Vitis riparia</u>	7	No	FACW	
3. <u>Calystegia sepium</u>	6	No	FAC	
4. <u>Eupatorium serotinum</u>	6	No	FAC	
5. _____				
6. _____				
7. _____				
8. _____				
9. _____				
10. _____				
_____ = Total Cover				
<b>Woody Vine Stratum</b> (Plot size: <u>30 ft radius</u> )				
1. _____				<b>Hydrophytic Vegetation Present?</b> <u>Yes</u>
2. _____				
_____ = Total Cover				
Remarks: (Include photo numbers here or on a separate sheet.)				

**SOIL**

Sampling Point:  K1-A

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)								
Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>		
0-10	10YR 3/1	97	10YR 3/4	3	C	M	SICL	
10-13	10YR 3/1	95	5YR 3/4	5	C	M	SICL	

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. <sup>2</sup> Location: PL=Pore Lining, M=Matrix

<p><b>Hydric Soil Indicators:</b></p> <input type="checkbox"/> Histosol (A1) <input type="checkbox"/> Histic Epipedon (A2) <input type="checkbox"/> Black Histic (A3) <input type="checkbox"/> Hydrogen Sulfide (A4) <input type="checkbox"/> Stratified Layers (A5) <input type="checkbox"/> 2 cm Muck (A10) <input type="checkbox"/> Depleted Below Dark Surface (A11) <input type="checkbox"/> Thick Dark Surface (A12) <input type="checkbox"/> Sandy Mucky Mineral (S1) <input type="checkbox"/> 5 cm Mucky Peat or Peat (S3)	<input type="checkbox"/> Sandy Gleyed Matrix (S4) <input type="checkbox"/> Sandy Redox (S5) <input type="checkbox"/> Stripped Matrix (S6) <input type="checkbox"/> Loamy Mucky Mineral (F1) <input type="checkbox"/> Loamy Gleyed Matrix (F2) <input type="checkbox"/> Depleted Matrix (F3) <input checked="" type="checkbox"/> Redox Dark Surface (F6) <input type="checkbox"/> Depleted Dark Surface (F7) <input type="checkbox"/> Redox Depressions (F8)	<p><b>Indicators for Problematic Hydric Soils<sup>3</sup>:</b></p> <input type="checkbox"/> Coast Prairie Redox (A16) <input type="checkbox"/> Dark Surface (S7) <input type="checkbox"/> Iron-Manganese Masses (F12) <input type="checkbox"/> Very Shallow Dark Surface (TF12) <input type="checkbox"/> Other (Explain in Remarks)
---	---	---

<sup>3</sup> Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

<p><b>Restrictive Layer (if observed):</b>                  Type: _____                  Depth (inches): _____</p>	<p><b>Hydric Soil Present?</b> <u> Yes </u></p>
--	---

Remarks:

**HYDROLOGY**

<p><b>Wetland Hydrology Indicators:</b>                  Primary Indicators (minimum of one is required: check all that apply)</p> <input type="checkbox"/> Surface Water (A1) <input type="checkbox"/> High Water Table (A2) <input type="checkbox"/> Saturation (A3) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<p>Secondary Indicators (minimum of two is required)</p> <input type="checkbox"/> Water-Stained Leaves (B9) <input type="checkbox"/> Aquatic Fauna (B13) <input type="checkbox"/> True Aquatic Plants (B14) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Gauge or Well Data (D9) <input type="checkbox"/> Other (Explain in Remarks)
---	--

<p><b>Field Observations:</b>                  Surface Water Present? <u> No </u> Depth (inches): _____                  Water Table Present? <u> No </u> Depth (inches): _____                  Saturation Present? <u> No </u> Depth (inches): _____                  (includes capillary fringe)</p>	<p><b>Wetland Hydrology Present?</b> <u> No </u></p>
---	--

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: According to the 2012 ISGS Annual Water Level Report to IDOT (OFS 2012-07) this area does not satisfy wetland hydrology criteria for 14 or more consecutive days during the growing season.

### WETLAND DETERMINATION DATA FORM - Midwest Region

Project/Site: The Morris Wetland Bank City/County: Grundy Sampling Date 9/18/2012  
 Applicant/Owner: IDOT District 3 State: IL Sampling Point K1-B  
 Investigator(s): Nieset and Geatz Section, Township, Range: Sec 11, T33, R7E  
 Landform (hillslope, terrace, etc.): Floodplain Local relief (concave, convex, none): None to Concave  
 Slope (%): <1 Lat: 41.35591 Long: -88.39239 Datum: NAD 83  
 Soil Map Unit Name: Sawmill SICL, 0-2% slopes, frequently flooded NWI classification: U  
 Are climatic/hydrologic conditions on the site typical for this time of year? No (If no explain in Remarks.)  
 Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes  
 Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

**SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.**

Hydrophytic Vegetation Present? <u>Yes</u> Hydric Soil Present? <u>Yes</u> Wetland Hydrology Present? <u>Yes</u>	<b>Is the Sampled Area within a Wetland?</b> <u>Yes</u>
Remarks: Community type is wet forbland. According to the U.S. Drought Monitor, this area of the state experienced a severe drought for a portion of the year.	

**VEGETATION -Use scientific names of plants.**

Tree Stratum (Plot size: 30 ft radius)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet:
1. _____				Number of Dominant Species That are OBL, FACW, or FAC: <u>4</u> (A)
2. _____				Total Number of Dominant Species Across All Strata: <u>4</u> (B)
3. _____				Percent of Dominant Species That are OBL, FACW, or FAC: <u>100%</u> (A/B)
4. _____				
5. _____				
_____ = Total Cover				<b>Prevalence Index worksheet:</b>
Sapling/Shrub Stratum (Plot size: 15 ft radius)				Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals _____ (A) _____ (B) Prevalence Index =B/A = _____
1. _____				<b>Hydrophytic Vegetation Indicators</b> <input type="checkbox"/> 1-Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2-Dominance Test is >50% <input type="checkbox"/> 3-Prevalence Index is < or =3.0 <sup>1</sup> <input type="checkbox"/> 4-Morphological Adaptations <sup>1</sup> (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)  <sup>1</sup> Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
2. _____				
3. _____				
4. _____				
5. _____				
_____ = Total Cover				
Herb Stratum (Plot size: 5 ft radius)				
1. <i>Bidens comosa</i>	22	Yes	OBL	
2. <i>Eupatorium serotinum</i>	22	Yes	FAC	
3. <i>Boltonia asteroides</i>	18	Yes	OBL	
4. <i>Toxicodendron radicans</i>	18	Yes	FAC	
5. <i>Solidago canadensis</i>	12	No	FACU	
6. <i>Carex sp.</i>	11	No		
7. <i>Acer rubrum</i>	9	No	FAC	
8. <i>Calystegia sepium</i>	6	No	FAC	
9. <i>Poa pratensis</i>	5	No	FAC	
10. _____				
_____ = Total Cover				<b>Hydrophytic Vegetation Present?</b> <u>Yes</u>
Woody Vine Stratum (Plot size: 30 ft radius)				
1. _____				
2. _____				
_____ = Total Cover				
Remarks: (Include photo numbers here or on a separate sheet.)				

**SOIL**

Sampling Point:  K1-B

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)								
Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>		
0-7	10YR 3/2	100					SICL	
7-13	10YR 3/2	95	10YR 3/4	5	C	M	SICL	

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

<sup>2</sup> Location: PL=Pore Lining, M=Matrix

<p><b>Hydric Soil Indicators:</b></p> <input type="checkbox"/> Histosol (A1) <input type="checkbox"/> Histic Epipedon (A2) <input type="checkbox"/> Black Histic (A3) <input type="checkbox"/> Hydrogen Sulfide (A4) <input type="checkbox"/> Stratified Layers (A5) <input type="checkbox"/> 2 cm Muck (A10) <input type="checkbox"/> Depleted Below Dark Surface (A11) <input type="checkbox"/> Thick Dark Surface (A12) <input type="checkbox"/> Sandy Mucky Mineral (S1) <input type="checkbox"/> 5 cm Mucky Peat or Peat (S3)	<input type="checkbox"/> Sandy Gleyed Matrix (S4) <input type="checkbox"/> Sandy Redox (S5) <input type="checkbox"/> Stripped Matrix (S6) <input type="checkbox"/> Loamy Mucky Mineral (F1) <input type="checkbox"/> Loamy Gleyed Matrix (F2) <input type="checkbox"/> Depleted Matrix (F3) <input checked="" type="checkbox"/> Redox Dark Surface (F6) <input type="checkbox"/> Depleted Dark Surface (F7) <input type="checkbox"/> Redox Depressions (F8)	<p><b>Indicators for Problematic Hydric Soils<sup>3</sup>:</b></p> <input type="checkbox"/> Coast Prairie Redox (A16) <input type="checkbox"/> Dark Surface (S7) <input type="checkbox"/> Iron-Manganese Masses (F12) <input type="checkbox"/> Very Shallow Dark Surface (TF12) <input type="checkbox"/> Other (Explain in Remarks)
---	---	---

<sup>3</sup> Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

<p><b>Restrictive Layer (if observed):</b>                  Type: _____                  Depth (inches): _____</p>	<p><b>Hydric Soil Present?</b> <u> Yes </u></p>
--	---

Remarks:

**HYDROLOGY**

<p><b>Wetland Hydrology Indicators:</b>                  Primary Indicators (minimum of one is required: check all that apply)</p> <input type="checkbox"/> Surface Water (A1) <input type="checkbox"/> High Water Table (A2) <input type="checkbox"/> Saturation (A3) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Water-Stained Leaves (B9) <input type="checkbox"/> Aquatic Fauna (B13) <input type="checkbox"/> True Aquatic Plants (B14) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Gauge or Well Data (D9) <input type="checkbox"/> Other (Explain in Remarks)	<p>Secondary Indicators (minimum of two is required)</p> <input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Stunted or Stressed Plants (D1) <input checked="" type="checkbox"/> Geomorphic Position (D2) <input checked="" type="checkbox"/> FAC-Neutral Test (D5)
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<p><b>Field Observations:</b>                  Surface Water Present? <u> No </u> Depth (inches): _____                  Water Table Present? <u> No </u> Depth (inches): _____                  Saturation Present? <u> No </u> Depth (inches): _____                  (includes capillary fringe)</p>	<p><b>Wetland Hydrology Present?</b> <u> Yes </u></p>
---	---

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: According to the 2012 ISGS Annual Water Level Report to IDOT (OFS 2012-07) this area satisfies wetland hydrology criteria for 14 or more consecutive days during the growing season.

### WETLAND DETERMINATION DATA FORM - Midwest Region

Project/Site: The Morris Wetland Bank City/County: Grundy Sampling Date 9/18/2012  
 Applicant/Owner: IDOT District 3 State: IL Sampling Point K1-C  
 Investigator(s): Nieset and Geatz Section, Township, Range: Sec 11, T33, R7E  
 Landform (hillslope, terrace, etc.): Floodplain Local relief (concave, convex, none): None to Convex  
 Slope (%): <1 Lat: 41.35648 Long: -88.39250 Datum: NAD 83  
 Soil Map Unit Name: NRCS mapped Sawmill SICL; revised to Lawson SIL, 0-2% slopes NWI classification: U  
 Are climatic/hydrologic conditions on the site typical for this time of year? No (If no explain in Remarks.)  
 Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes  
 Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

**SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.**

Hydrophytic Vegetation Present? <u>No</u> Hydric Soil Present? <u>No</u> Wetland Hydrology Present? <u>No</u>	<b>Is the Sampled Area within a Wetland?</b> <u>No</u>
Remarks: Community type is forbland.  According to the U.S. Drought Monitor, this area of the state experienced a severe drought for a portion of the year.	

**VEGETATION -Use scientific names of plants.**

Tree Stratum (Plot size: 30 ft radius)	Absolute % Cover	Dominant Species?	Indicator Status	
1. _____				<b>Dominance Test worksheet:</b> Number of Dominant Species That are OBL, FACW, or FAC: <u>1</u> (A) Total Number of Dominant Species Across All Strata: <u>2</u> (B) Percent of Dominant Species That are OBL, FACW, or FAC: <u>50%</u> (A/B)
2. _____				
3. _____				
4. _____				
5. _____				
<u>3</u> = Total Cover				<b>Prevalence Index worksheet:</b> Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals _____ (A) _____ (B) Prevalence Index =B/A = _____
Sapling/Shrub Stratum (Plot size: 15 ft radius)	Absolute % Cover	Dominant Species?	Indicator Status	
1. <i>Fraxinus lanceolata</i>	3	No	FACW	
2. _____				
3. _____				
4. _____				
5. _____				
<u>3</u> = Total Cover				
Herb Stratum (Plot size: 5 ft radius)	Absolute % Cover	Dominant Species?	Indicator Status	
1. <i>Solidago canadensis</i>	47	Yes	FACU	
2. <i>Toxicodendron radicans</i>	42	Yes	FAC	
3. <i>Carex sp.</i>	2	No		
4. _____				
5. _____				
6. _____				
7. _____				
8. _____				
9. _____				
10. _____				
<u>91</u> = Total Cover				
Woody Vine Stratum (Plot size: 30 ft radius)	Absolute % Cover	Dominant Species?	Indicator Status	
1. _____				
2. _____				
_____ = Total Cover				
<b>Hydrophytic Vegetation Indicators</b> <input type="checkbox"/> 1-Rapid Test for Hydrophytic Vegetation <input type="checkbox"/> 2-Dominance Test is >50% <input type="checkbox"/> 3-Prevalence Index is < or =3.0 <sup>1</sup> <input type="checkbox"/> 4-Morphological Adaptations <sup>1</sup> (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)				
<sup>1</sup> Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.				
<b>Hydrophytic Vegetation Present?</b> <u>No</u>				
Remarks: (Include photo numbers here or on a separate sheet.)				



**APPENDIX B**

**Wetland Plant Species List**

Project Title: The Morris Wetland Bank  
Site K1 - Wet forbland

Sequence No: 1306

Scientific Name	Common Name	Strata	Wetland Indicator Status	Coefficient of Conservatism
<i>Abutilon theophrasti</i> *	buttonweed	H	FACU	-
<i>Acer negundo</i>	box elder	HST	FAC	1
<i>Acer rubrum</i>	red maple	HS	FAC	5
<i>Acer saccharinum</i>	silver maple	HST	FACW	1
<i>Ageratina altissima</i>	white snakeroot	H	FACU	2
<i>Alliaria petiolata</i> *	garlic mustard	H	FAC	-
<i>Amaranthus tuberculatus</i>	tall waterhemp	H	OBL	1
<i>Ambrosia trifida</i>	giant ragweed	H	FAC	0
<i>Apocynum cannabinum</i>	dogbane	H	FAC	2
<i>Asclepias incarnata</i>	swamp milkweed	H	OBL	4
<i>Asclepias syriaca</i>	common milkweed	H	FACU	0
<i>Asclepias verticillata</i>	horsetail milkweed	H	FACU	1
<i>Asimina triloba</i>	pawpaw	HST	FAC	4
<i>Aster lanceolatus</i>	panicked aster	H	FAC	3
<i>Aster ontarionis</i>	Ontario aster	H	FAC	4
<i>Aster pilosus</i>	hairy aster	H	FACU	0
<i>Bidens comosa</i>	swamp tickseed	H	OBL	2
<i>Bidens coronata</i>	tall swamp marigold	H	OBL	7
<b><i>Bidens frondosa</i></b>	<b>common beggar's ticks</b>	<b>H</b>	<b>FACW</b>	<b>1</b>
<b><i>Boltonia asteroides</i></b>	<b>false aster</b>	<b>H</b>	<b>OBL</b>	<b>5</b>
<i>Bromus inermis</i> *	Hungarian brome	H	FACU	-
<i>Calystegia sepium</i>	American bindweed	H	FAC	1
<i>Carex grayi</i>	common bur sedge	H	FACW	6
<i>Carex sp.</i>	sedge	H		-
<i>Carex vulpinoidea</i>	brown fox sedge	H	FACW	3
<i>Celtis occidentalis</i>	hackberry	HS	FAC	3
<i>Cichorium intybus</i> *	chickory	H	FACU	-
<i>Cirsium arvense</i> *	field thistle	H	FACU	-
<i>Cirsium vulgare</i> *	bull thistle	H	FACU	-
<i>Conyza canadensis</i>	horseweed	H	FACU	0
<i>Dactylis glomerata</i> *	orchard grass	H	FACU	-
<i>Daucus carota</i> *	Queen Anne's lace	H	UPL	-
<b><i>Echinochloa muricata</i></b>	<b>spiny barnyard grass</b>	<b>H</b>	<b>OBL</b>	<b>0</b>
<i>Elaeagnus umbellata</i> *	autumn olive	HS	UPL	-
<i>Eleocharis erythropoda</i>	red-rooted spike rush	H	OBL	3
<i>Elymus virginicus</i>	Virginia wild rye	H	FACW	4
<i>Erigeron annuus</i>	annual fleabane	H	FACU	1
<i>Erigeron strigosus</i>	daisy fleabane	H	FACU	2
<i>Eupatorium altissimum</i>	tall boneset	H	UPL	2
<i>Eupatorium serotinum</i>	late boneset	H	FAC	1
<i>Festuca arundinacea</i> *	tall fescue	H	FACU	-
<i>Fraxinus lanceolata</i>	green ash	HS	FACW	2
<i>Geum canadense</i>	white avens	H	FAC	2
<i>Glechoma hederacea</i> *	ground ivy	H	FACU	-
<i>Gleditsia triacanthos</i>	honey locust	HST	FACU	2

## Site K1 - Wet forbland

Scientific Name	Common Name	Strata	Wetland Indicator Status	Coefficient of Conservatism
<i>Helenium autumnale</i>	sneezeweed	H	FACW	3
<i>Hordeum jubatum</i> *	squirrel-tail grass	H	FAC	-
<i>Ipomoea lacunosa</i>	small morning glory	H	FACW	1
<i>Juglans nigra</i>	black walnut	HS	FACU	4
<i>Juniperus virginiana</i>	eastern red cedar	H	FACU	1
<i>Leersia oryzoides</i>	rice cut grass	H	OBL	3
<i>Lonicera maackii</i> *	Amur honeysuckle	HS	UPL	-
<i>Lycopus americanus</i>	common water horehound	H	OBL	3
<i>Lysimachia nummularia</i> *	moneywort	H	FACW	-
<i>Medicago lupulina</i> *	black medic	H	FACU	-
<i>Melilotus alba</i> *	white sweet clover	H	FACU	-
<i>Melilotus officinalis</i> *	yellow sweet clover	H	FACU	-
<i>Pastinaca sativa</i> *	wild parsnip	H	UPL	-
<i>Persicaria amphibia</i>	water knotweed	H	OBL	3
<i>Persicaria hydropiper</i> *	water pepper	H	OBL	-
<i>Persicaria lapathifolia</i>	curttop lady's thumb	H	FACW	0
<i>Persicaria pensylvanica</i>	pinkweed	H	FACW	1
<i>Persicaria punctata</i>	smartweed	H	OBL	3
<b><i>Phalaris arundinacea</i>*</b>	<b>reed canary grass</b>	<b>H</b>	<b>FACW</b>	-
<i>Phyla lanceolata</i>	fog fruit	H	OBL	1
<i>Physalis subglabrata</i>	smooth ground cherry	H	UPL	0
<i>Plantago lanceolata</i> *	English plantain	H	FACU	-
<i>Plantago rugelii</i>	red-stalked plantain	H	FAC	0
<i>Platanus occidentalis</i>	sycamore	HST	FACW	3
<i>Poa pratensis</i> *	Kentucky blue grass	H	FAC	-
<i>Populus deltoides</i>	eastern cottonwood	HST	FAC	2
<i>Potentilla norvegica</i>	rough cinquefoil	H	FAC	0
<i>Prunella vulgaris</i> *	lawn prunella	H	FAC	-
<i>Quercus bicolor</i>	swamp white oak	T	FACW	7
<i>Rorippa palustris</i> var. <i>palustris</i>	marsh yellow cress	H	OBL	4
<i>Rosa multiflora</i> *	Japanese rose	HS	FACU	-
<i>Rubus occidentalis</i>	black raspberry	H	UPL	2
<i>Rudbeckia hirta</i>	black-eyed Susan	H	FACU	2
<i>Rudbeckia laciniata</i>	wild golden glow	H	FACW	3
<i>Rudbeckia triloba</i>	brown-eyed Susan	H	FACU	3
<i>Rumex altissimus</i>	pale dock	H	FACW	2
<i>Rumex crispus</i> *	curly dock	H	FAC	-
<i>Salix amygdaloides</i>	peach-leaved willow	HS	FACW	4
<i>Salix interior</i>	sandbar willow	HST	FACW	1
<i>Salix nigra</i>	black willow	HST	OBL	3
<i>Sambucus canadensis</i>	common elder	S	FACW	2
<i>Setaria faberi</i> *	giant foxtail	H	FACU	-
<i>Setaria glauca</i> *	pigeon grass	H	FAC	-
<i>Solanum carolinense</i>	horse nettle	H	FACU	0
<i>Solidago canadensis</i>	Canada goldenrod	H	FACU	1
<i>Solidago gigantea</i>	late goldenrod	H	FACW	3
<i>Stachys tenuifolia</i>	smooth hedge nettle	H	OBL	5

## Site K1 - Wet forbland

Scientific Name	Common Name	Strata	Wetland Indicator Status	Coefficient of Conservatism
<i>Taraxacum officinale</i> *	common dandelion	H	FACU	-
<i>Toxicodendron radicans</i>	poison ivy	H	FAC	1
<i>Tridens flavus</i>	common purpletop	H	UPL	1
<i>Trifolium repens</i> *	white clover	H	FACU	-
<i>Ulmus americana</i>	American elm	HS	FACW	5
<i>Ulmus pumila</i> *	Siberian elm	HS	UPL	-
<i>Verbena hastata</i>	blue vervain	H	FACW	3
<i>Verbena urticifolia</i>	white vervain	H	FAC	3
<i>Verbesina alternifolia</i>	wingstem	H	FACW	4
<i>Viola pratincola</i>	common blue violet	H	FAC	1
<i>Vitis riparia</i>	riverbank grape	H	FACW	2
<i>Xanthium strumarium</i>	cocklebur	H	FAC	0
*Non-native species <b>Bolded species is dominant in the denoted stratum</b>			Mean C =	2.3
H = Herb, T = Tree, S = Sapling/Shrub, W = Woody Vine			FQI =	19.4

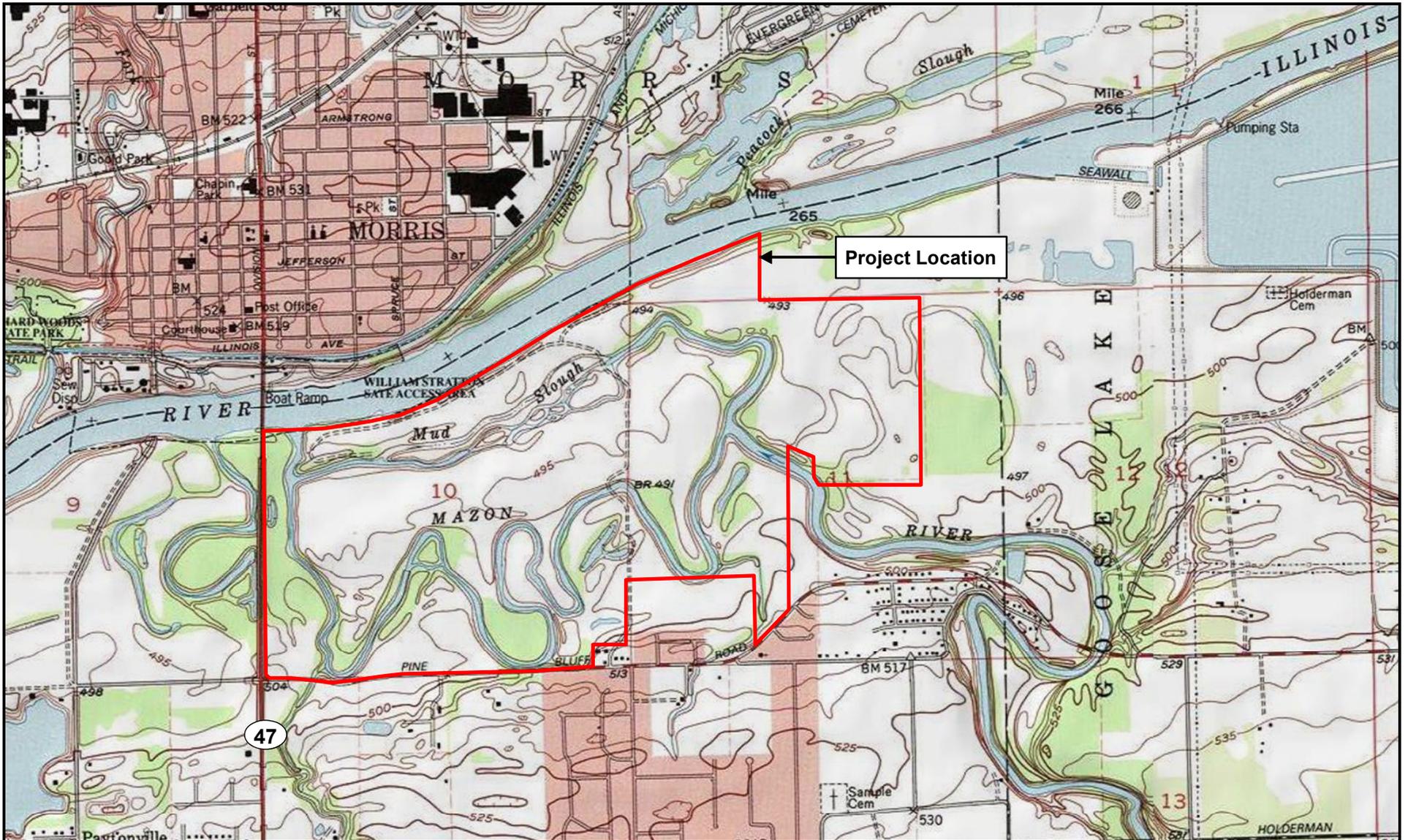
## **APPENDIX C**

### **Figures**

**Figure 1 – Project Location Map**

**Figure 2 – Mitigation Monitoring Map**

**Figure 3 – ISGS 2012 Wetland Hydrology Map**



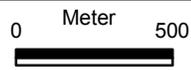
University of Illinois at Urbana-Champaign



Wetland Science Program  
 1816 South Oak Street  
 Champaign, Illinois 61820

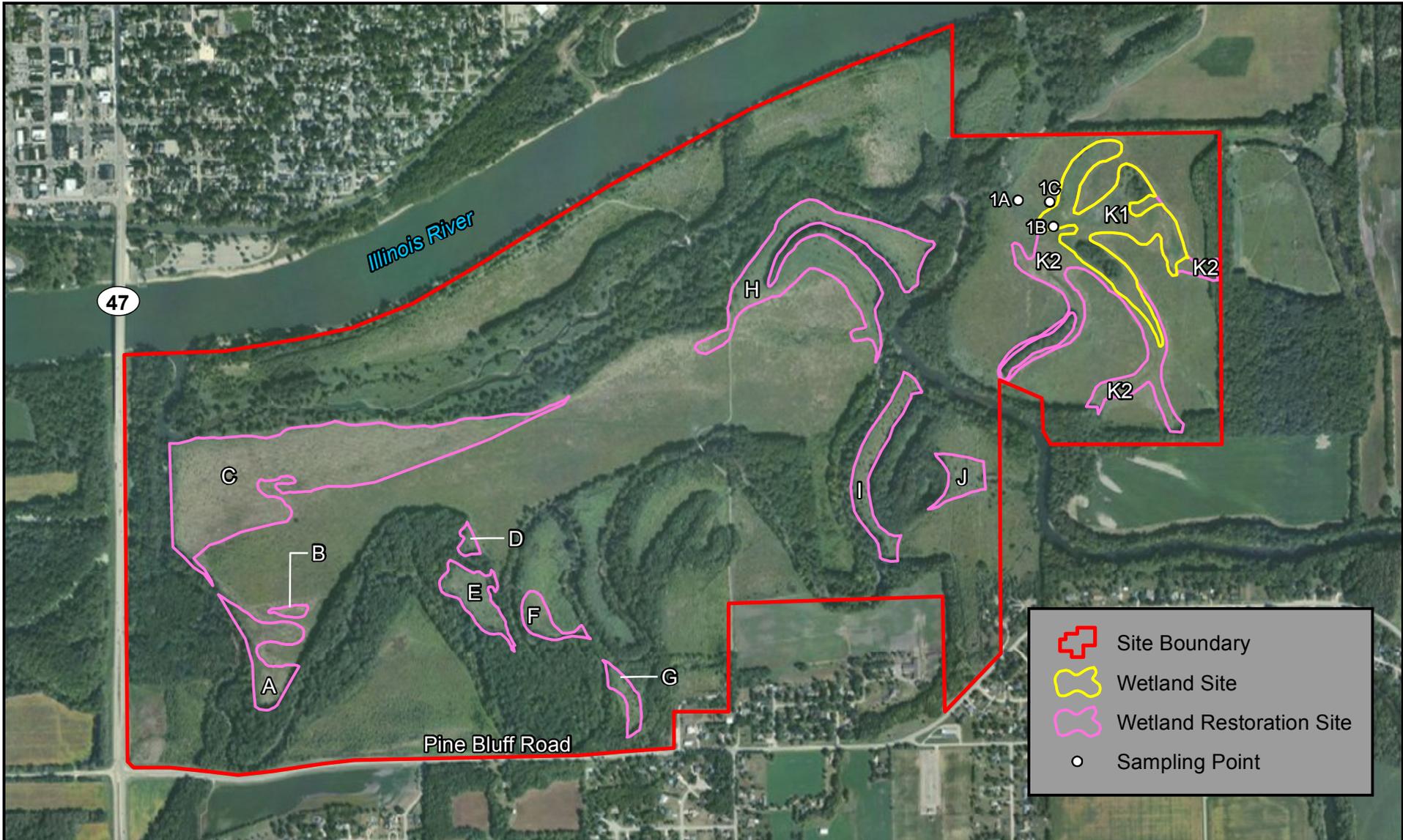
**Figure 1**  
**Project Location Map**  
**Morris Mitigation Bank**  
**Grundy County**

Seq. No: 1306



December 2012





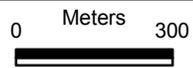
University of Illinois at Urbana-Champaign



**Wetland Science Program**  
1816 South Oak Street  
Champaign, Illinois 61820

**Figure 2**  
**Mitigation Monitoring Map**  
**Morris Mitigation Bank**  
**Grundy County**

Seq. No: 1306



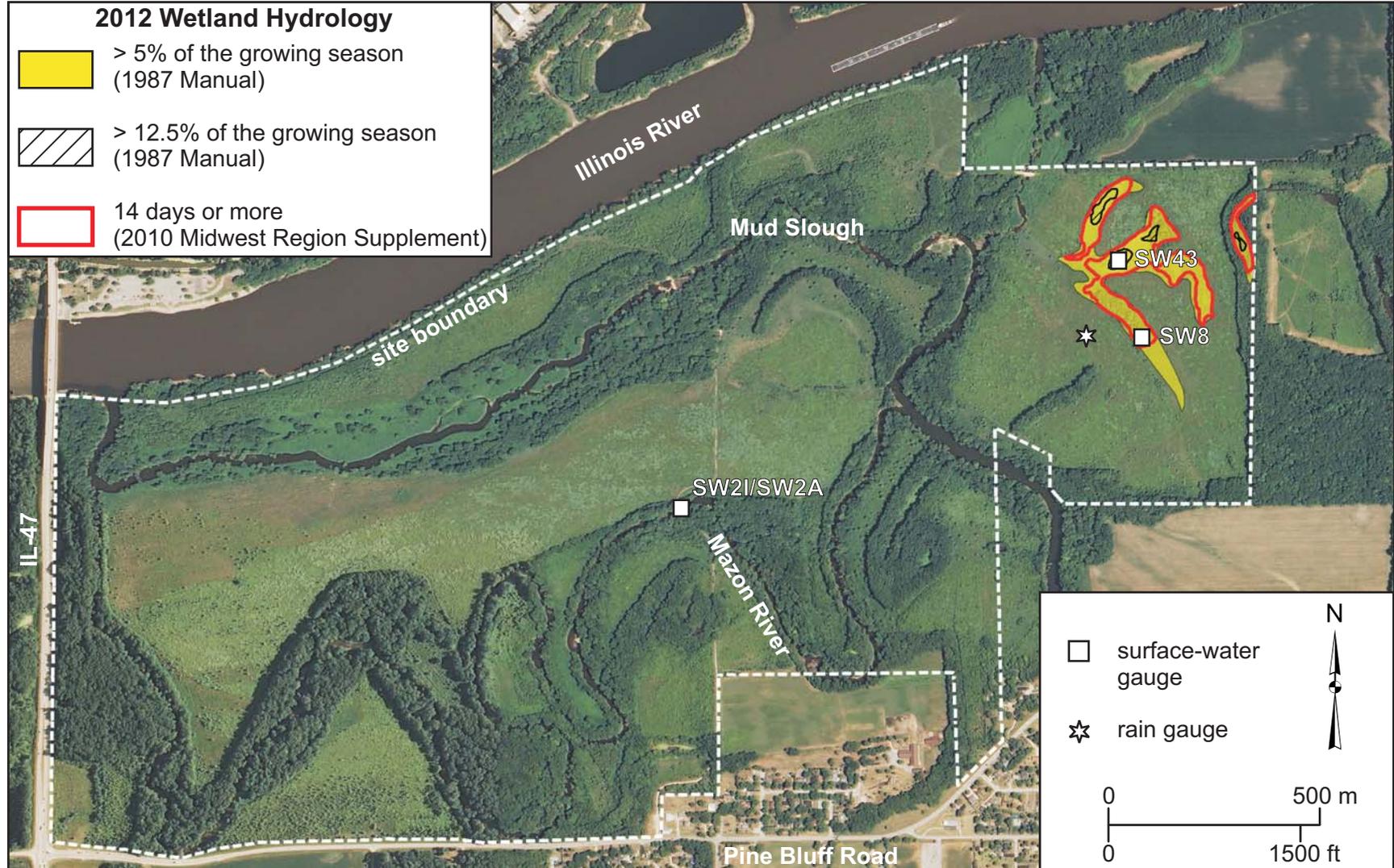
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# Figure 3 - ISGS 2012 Wetland Hydrology Map

## Morris Wetland Mitigation Bank Estimated Areal Extent of 2012 Wetland Hydrology September 1, 2011 through August 31, 2012

Map based on 2012 Farm Service Agency digital orthophotography, Grundy County, Illinois (USDA-FSA 2012)



From: Miner et al. (2012)

**APPENDIX D**

**Photographs of Wetland Mitigation Site**



Photograph 1. Planned Wetland A, facing east.



Photograph 2. Planned Wetland B, facing east.



Photograph 3. Planned Wetland C, facing east.



Photograph 4. Planned Wetland D, facing northwest.



Photograph 5. Planned Wetland E, facing southwest.



Photograph 6. Planned Wetland F, facing south.



Photograph 7. Planned Wetland G, facing south.



Photograph 8. Planned Wetland H, facing east.



Photograph 9. Planned Wetland I, facing northwest.



Photograph 10. Planned Wetland J, facing northeast.



Photo 11. Planned Wetland K-1, facing north.



Photo 12. Planned Wetland K-2, facing southwest.