

# Smart Wetlands Mitigation for Iowa Department of Transportation Projects

**Final Report**  
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<b>16. Abstract</b> <p>The purpose of this project was to develop a framework for an Iowa Wetland Mitigation Clearinghouse (IWMC) and showcase typical inventories that will serve agencies and communities involved with wetland mitigation.</p> <p>While the Iowa DOT currently performs wetland mitigation on a project-by-project basis, other agencies such as the Iowa Department of Natural Resources and the Natural Resource Conservation Service perform wetland restoration projects, and counties and cities mitigate wetland losses as well. The Iowa DOT desired to determine whether state and local resources may be used cooperatively in developing shared wetland mitigation projects in ways that will benefit both Iowa agencies and local governments.</p> <p>This project accomplished the following tasks:</p> <ol style="list-style-type: none"> <li>1. Developed a conceptual framework for cooperative wetland mitigation that utilizes the concept of an IWMC.</li> <li>2. Reviewed the inventories available for wetlands mitigation in Iowa.</li> <li>3. Created a template cooperative umbrella instrument to be used in the approval process.</li> <li>4. Developed a template project outline and flow chart of the proposed IWMC concept.</li> <li>5. Worked to raise awareness of and appreciation for the value of local wetlands and their responsible use through educational materials, technical assistance, and workshops, while pointing out the consequences of species and wetland loss.</li> </ol>			
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# **SMART WETLANDS MITIGATION FOR IOWA DEPARTMENT OF TRANSPORTATION PROJECTS**

**Final Report  
September 2006**

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## TABLE OF CONTENTS

ACKNOWLEDGMENTS .....	IX
INTRODUCTION .....	1
Problem Statement and Research Objectives .....	1
Acronyms Used in This Report.....	2
PROJECT BACKGROUND.....	4
Concurrent IHRB Research (Project TR-526).....	5
Recommendations of the IHRB Study.....	5
LEGISLATIVE AND REGULATORY BACKGROUND .....	8
Wetland Mitigation Banks .....	8
In-Lieu Fee Mitigation.....	9
IDENTIFICATION OF WETLANDS.....	12
Wetland Vegetation .....	12
Wetland Soils .....	13
Wetlands Hydrology .....	16
DEVELOPING THE IOWA WETLAND MITIGATION CLEARINGHOUSE (IWMC)	
CONCEPT .....	18
Developing the IWMC Concept .....	18
Presenting the IWMC Concept to the MBRT .....	19
Defining the IWMC Process .....	24
MAP INVENTORY: SIX COUNTIES OF THE PRAIRIE RIVERS OF IOWA RESOURCE	
CONSERVATION AND DEVELOPMENT DISTRICT .....	26
Soils Classification .....	26
Wetland Hydrology.....	26
Ownership.....	27
PILOT PROJECT DEFINITION.....	28
Mitigation Activity Description.....	29
Approaches to Wetland Mitigation.....	29
Summary Recommendations .....	29
REFERENCES .....	31
APPENDIX A. MITIGATION BANKING MAPS IN IOWA.....	A-1
APPENDIX B. COOPERATIVE UMBRELLA INSTRUMENT .....	B-1





## LIST OF FIGURES

Figure 1. Generalized soil profile .....	14
Figure 2. Pilot wetlands mitigation clearinghouse concept .....	18
Figure 3. Illustrative flowchart of the mitigation clearinghouse process .....	28



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## **INTRODUCTION**

The Iowa Department of Transportation (Iowa DOT) received a grant from the Federal Highway Administration's Office of Project Development and Environmental Review to develop a processing tool that can effectively mitigate small impacts to wetlands resulting from transportation-related projects. The initial goal of the project was to develop a state-wide in-lieu fee program to facilitate the cost-effective and efficient mitigation of small impacts. As the research proceeded, the goal changed to develop a process that incorporates a wetlands clearinghouse into the approval process.

A Project Oversight Committee was established in December 2004 to guide the project. The members of the oversight committee also constitute Iowa's Mitigation Banking Review Team (MBRT). The members are as follows:

- Mike LaPietra, Federal Highway Administration, Iowa Division
- Scott Marler, Iowa DOT
- Neal Johnson, U.S. Army Corps of Engineers
- Heidi Woeber, U.S. Fish and Wildlife Service
- Jason Daniels, Environmental Protection Agency
- Mark Lindflott, National Resource Conservation Service
- Christine Schwake, Iowa Department of Natural Resources
- John Goode, Monroe County Engineer
- Jeb Brewer, City of Des Moines Engineer
- Rick Robinson, Iowa Farm Bureau

### **Problem Statement and Research Objectives**

The purpose of this project is to develop a framework for an Iowa Wetland Mitigation Clearinghouse (IWMC) and showcase typical inventories that will serve agencies and communities involved with wetland mitigation.

The Iowa DOT currently performs wetland mitigation on a project-by-project basis. While the Iowa DOT is mitigating projects on a case-by-case basis, other agencies such as the Iowa Department of Natural Resources (Iowa DNR) and the Natural Resource Conservation Service (NRCS) are performing wetland restoration projects, and counties and cities are mitigating wetland losses as well. The Iowa DOT desired to determine whether state and local resources may be utilized cooperatively in developing shared wetland mitigation projects in ways that will benefit both Iowa agencies and local governments.

The objectives of the present project were as follows:

1. Form a study committee.
2. Conduct a focus group on smart wetland mitigation.
3. Develop instruments of smart wetland mitigation.
4. Complete a final report.

5. Exchange and publish the information discovered in this project.

This project accomplished the following tasks:

6. Developed a conceptual framework for cooperative wetland mitigation that utilizes the concept of an IWMC.
7. Reviewed the inventories available for wetlands mitigation in Iowa.
8. Created a template cooperative umbrella instrument (CUI) to be used in the approval process (see Appendix B).
9. Developed a template project outline and flow chart of the proposed IWMC concept.
10. Worked to raise awareness of and appreciation for the value of local wetlands and their responsible use through educational materials, technical assistance, and workshops, while pointing out the consequences of species and wetland loss.

The remainder of this report describes the recent history of wetlands mitigation in the United States, the legislative and regulatory background of wetlands mitigation in Iowa, the defining characteristics of wetlands, recent scoping and focus group meetings regarding Iowa wetlands mitigation strategies, and a pilot project conducted in the Prairie Rivers Resource Conservation and Development (RC&D) District.

### **Acronyms Used in This Report**

- *CUI*. Cooperative Umbrella Instrument.
- *CLU*. Common land unit.
- *CRP*. Conservation Reserve Program.
- *CTRE*. Center for Transportation Research and Education.
- *DOT*. Department of Transportation.
- *EIS*. Environmental impact statement.
- *EPA*. Environmental Protection Agency.
- *EWRP*. Emergency Wetlands Reserve Program.
- *EWP-FP*. Emergency Watershed Protection Program-Flood Plain.
- *FWP*. Farmable Wetland Program.
- *HU*. Hydrologic unit.
- *IHRB*. Iowa Highway Research Board.
- *Iowa DNR*. Iowa Department of Natural Resources.
- *ISU*. Iowa State University.
- *IWMC*. Iowa Wetland Mitigation Clearinghouse.
- *MBRT*. Mitigation Banking Review Team.
- *MLRA*. Major land resource area.
- *NASIS*. National Soil Information System.
- *NEPA*. National Environmental Policy Act.
- *NRCS*. Natural Resource Conservation Service.
- *NWI*. National Wetland Inventory.
- *RC&D*. Resource Conservation and Development.
- *SSURGO*. Survey Soil Geographic Database.

- *USACE*. United States Army Corps of Engineers.
- *USDA*. United States Department of Agriculture.
- *USDA-FSA*. USDA-Farm Service Agency.
- *WRP*. Wetland Reserve Program.

## PROJECT BACKGROUND

Many transportation improvement projects involve unavoidable but small impacts to streams and wetlands. Examples include bridge replacement with widened approaches or abutments, selective road widening or geometric changes to improve safety, or roadway realignments near wetlands. In order to receive a construction permit from the U.S. Army Corps of Engineers (USACE) under section 404 of the Clean Water Act, a wetland mitigation plan must be approved. The Iowa DOT has a policy to replace wetlands at a ratio of 1.5 to 1 and to apply a 30% safety factor based on a right-of-way to right-of-way project footprint. For unavoidable wetland impacts of five acres or less, it is very difficult to locate and purchase a parcel adjacent to the project area or within the watershed that meets the national and state requirements. This difficulty leads to higher project costs (e.g., purchase of additional land for wetland mitigation) and the potential for construction project delays.

Other states have used wetland banking or in-lieu fees to streamline the mitigation process in the spirit of the Clean Water Act. According to a 2002 report from the National Cooperative Highway Research Program, 26 state DOTs have established their own mitigation banks, 30 states have developed statutes or regulations for wetland banking, and 21 states have an in-lieu fee program (Marble and Riva 2002).

Iowa has an established MBRT composed of state and federal resource agency representatives. The MBRT is responsible for guiding the establishment of wetland mitigation banks in Iowa. To establish a wetland mitigation bank, a “banking instrument” (contract) is required that specifies how the bank will be established, operated, and monitored.

Iowa established its MBRT as required under the terms of 1995 Corps of Engineers Memorandum. The MBRT prepared “Mitigation Banking in Iowa,” a draft document that establishes procedures for creating a mitigation bank in Iowa.

In-lieu fee programs can be the simplest option for state DOTs because time and money are not spent on design, construction, or maintenance of the sites. Florida and North Carolina are the two states that use in-lieu fees to the greatest extent (Marble and Riva 2002, p.7). The Florida DOT has paid in-lieu fees to the St. Johns River Water Management District, contributing to 14 ongoing mitigation projects. The North Carolina DOT has paid over \$18 million to the Wetland Restoration Program, impacting 11 watersheds.

In Iowa, the Iowa DNR has developed one wetland bank in conjunction with the Iowa Farm Bureau in Central Iowa, and a private wetland bank exists in western Iowa. These banks are primarily for farmers. The Iowa DOT has also used in-lieu fees on a case-by-case basis when an appropriate recipient is available in the watershed, e.g., a county or city. As part of this plan, the Environmental Protection Agency (EPA) and USACE provide guidance for compensatory mitigation projects and appropriate use of preservation and vegetative buffers as a component of compensatory mitigation.



## **Concurrent IHRB Research (Project TR-526)**

Approximately while the present research was underway, the IHRB, at the request of the Iowa DOT, funded related wetlands mitigation research. The project, completed in February 2006, studied the feasibility of the cooperative development of wetland mitigation projects that serve agencies and communities involved with wetland mitigation.

The findings of the IHRB study indicate that most wetland mitigations conducted by the Iowa DOT in the last five years have constituted small acreages that are well under the 25-acre minimum adopted by the MBRT for considering wetland banking. The Iowa DOT staff in the Office of Location and Environment have a successful process in place for complying with the National Environmental Policy Act (NEPA) and for obtaining 401 and 404 permits when needed. Project delays do not appear to be associated with obtaining 404 permits. Accordingly, there is not a strong need for the Iowa DOT to change the current permitting process or to engage in wetland banking.

Moreover, wetland banking incurs financial risks. The Iowa DOT would have to spend state highway funds up front to build mitigation banks and hope to recoup the funds with project funds when the bank sells credits in the future. There are several cases around the country where a withdrawal of credits has not been approved after a bank was built, and thus the Iowa DOT should move very cautiously with regard to banking. An opportunistic approach is recommended. If a road project requiring mitigation is in an area where partners can be found, the Iowa DOT should be open to banking or other collaborative actions. This concept opens the door for considering a clearinghouse process to facilitate collaborative action.

A previously completed survey of Iowa cities and counties, included in the IHRB study, revealed that mostly very small mitigation activities (less than five acres) have occurred in the last five years. Cities and counties report administrative difficulties and expenditure of time and money on the 404 permit process. Based on the survey, counties, cities, and county conservation boards are willing to collaborate as partners if the conditions are right. However, only a few counties report mitigation projects that would support banking.

The Iowa DNR procures land annually for wetland restoration under the Prairie Pothole Joint Venture with the U.S. Fish and Wildlife Service. There is potential for the Iowa DOT to collaborate using this project, but only in the north central part of the state and under special location circumstances. The NRCS also purchases wetlands from landowners under the Wetland Reserve Program (WRP) and temporarily rents land under the Farmable Wetland Program (FWP). By viewing the NRCS as a local entity and by considering its activities in wetlands acquisition, there is potential for a clearinghouse function to be located with the NRCS.

## **Recommendations of the IHRB Study**

1. *A site-by-site mitigation process will continue to be the backbone of the Iowa DOT system.* Since the Iowa DOT has a very good staff and process in place for obtaining 404 and 401 permits, project delay for wetland reasons does not seem to be a significant problem, and there are few instances of Iowa DOT mitigations in the 25-acre range. This

report recommends that the site-by-site mitigation process continue to be the backbone of the Iowa DOT system.

2. *A site identification clearinghouse involving the NRCS should be established.* The current problems with mitigation include the following:
  - a. Obtaining wetland property for mitigation requires the Iowa DOT to purchase approximately four times the acreage required due to the real estate market.
  - b. The Iowa DOT does not want to manage wetlands or own excess property.
  - c. The sustainability of mitigation sites, although good by national standards, could be improved.

Because of these problems, this report recommends an IWMC centered at the NRCS to help identify landowners willing to sell wetlands. The Iowa DOT should request that the NRCS contact applicants to the WPR and landowners exiting the FWP in affected HUC 8 Districts to aid in obtaining mitigation sites. The NCRS would then bring the landowner and the Iowa DOT together for negotiations.

3. *A partnership clearinghouse should be established.* To help identify potential site managers or other agencies with mitigation needs, this report recommends an IWMC. While the partnering process currently happens on a project-by-project basis, the Iowa DOT should routinely contact cities, counties, the DNR, the Farm Bureau, the County Conservation Commission, and natural heritage foundations as early as possible in the mitigation process to see whether others have mitigation or restoration needs in the area or are willing to consider a management contract.
4. *The Iowa DOT should consider developing a pre-NEPA planning tool.* This planning tool could easily be developed from the Iowa portion of the National Wetland Inventory. (The inventory update is incomplete, but it is assumed that the DNR will gradually complete it.) The centerline of proposed highway projects can be overlaid (using GIS) on the Wetland Inventory Map, stripped of all Cowardin codes not generally associated with mitigation. This tool can return the estimated number of acres impacted. This tool would be crude compared to the field inventory conducted as part of NEPA, but it could produce an early acreage and budget estimate. We recommend that the Iowa DOT consider such a planning tool.
5. *A joint effort between the Iowa DOT and the Iowa DNR should be considered to develop banking service area definitions (watersheds) larger than HUC 8 and adjacent HUC 8 districts.* The level of road construction in the future may increase and make wetland banking more attractive. To prepare for this eventuality and to reduce the financial risk of wetland banking, the Iowa DOT and the Iowa DNR should consider a joint effort to develop banking service area definitions (watersheds) larger than HUC 8 and adjacent HUC 8 districts, following the Missouri model. Iowa agencies would need to negotiate with the Rock Island District of the USACE in advance to determine acceptable terms. If this were to be successful, bankers and project builders would have the fiduciary responsibility needed to use the banking process more effectively. The justification would presumably have to be based on the environmental benefits of systematic watershed improvement through building or restoring larger wetland sites. Mitigation could potentially be a watershed improvement tool instead of a detriment.



## **LEGISLATIVE AND REGULATORY BACKGROUND**

The U.S. EPA defines wetlands as follows (EPA 1989):

As used in this regulation, [wetlands] shall include those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas.

Historically, wetlands had been drained for farmland or developments because wetlands were considered unproductive and a nuisance. Advances in understanding the ecological function of wetlands led to placing a high value on preserving them, culminating in the Clean Water Act of 1977.

Two main sections of the Clean Water Act require permits for projects with impacts on wetlands. Section 404 gives the USACE jurisdiction to grant permits for construction activities within waterways and wetlands. This section requires any construction project that may require the loss of an acre or more of wetlands to notify and apply for a permit from the USACE. The Iowa DOT and any other agency building a project that impacts a wetland must file for a permit

Section 404 of the act regulates the “discharges” of “dredged or fill material” into waters of the United States. Since wetlands have water, they fall under this section of the act. The section also states that the wetlands program goal is “no net loss of wetlands.” The Clean Water Act does contain some wetland exemptions and allows some types of projects, such as highway building, to automatically receive general permits.

Section 401 of the Clean Water Act gives the EPA authority to regulate activities that have the potential to adversely affect water quality. Included in this category are projects that impact natural and artificial wetlands. When permitted activities disrupt wetlands, the Clean Water Act requires compensatory mitigation to offset the loss. The determination of compensatory mitigation and division of responsibilities between the USACE and the EPA are found in a 1990 Memorandum of Agreement between the EPA and the Department of the Army (EPA 1990). Wetlands may also be involved in projects that fall under the regulatory authority of NEPA, the Endangered Species Act, and the National Historic Preservation Act.

### **Wetland Mitigation Banks**

The 1991 Intermodal Surface Transportation Efficiency Act specifically addressed the use of wetland mitigation banks and authorized the use of federal funds for this type of wetland remediation. In 1993, President Clinton released his wetlands protection plan called “Protecting America’s Wetlands: A Fair, Flexible, and Effective Approach” (White House Office on Environmental Policy 1993). This plan attempted to balance the needs of landowners with the need to prevent further wetland losses. This plan endorsed the increased use of mitigation banking. Further direction was given to using wetland mitigation banks with a 1995 Memorandum to the Field, titled “Federal Guidance for the Establishment, Use, and Operation of

Mitigation Banks.” A cooperative effort between the EPA, the USACE, the NRCS, the U.S. Fish and Wildlife Services, and the National Marine Fisheries Service, the memorandum gave more detailed guidance than had been given previously concerning the use of mitigation banks when other types of compensation “cannot be achieved at the development site or would not be as environmentally beneficial”.

Many states and regional and local levels of government also have rules and regulations governing the use or modification of wetlands. These rules and regulations must be as strict as or stricter than the federal regulations and laws affecting wetlands. This may not seem to pose a significant problem, but in reality it has greatly added to the regulatory quagmire. For instance, no federal law requires bordering states to have the same regulations. Thus, wetlands that lay on state boundaries may require developers to conform to two different set of regulations that may not be compatible.

The 1985 Food Security Act expanded on the Clean Water Act. Part of the 1985 act states that farmers who convert wetlands cannot receive federal farm aid or benefits for commodities grown on the converted land. Even legally converted wetlands are not an exception to this act (U.S. General Accounting Office 1991). This is known as the “Swamp Buster” provision.

The EPA and the USACE established the National Wetlands Mitigation Action Plan in 2002. The goal of that plan was to provide no net loss of the nation’s wetlands. The following guiding themes are integral to the mission:

- Provide a consistent voice on compensatory mitigation matters
- Focus guidance, research, and resources to advance ecologically meaningful compensatory mitigation
- Provide information and options to those who need to mitigate the losses of wetland functions
- Provide technical and research assistance to those who undertake the work of mitigation

As part of this plan, the EPA and the USACE provided guidance for compensatory mitigation projects and appropriate use of preservation and vegetative buffers as a component of compensatory mitigation.

Iowa has established its MBRT as required under the terms of the 1995 USACE memorandum. The MBRT prepared “Mitigation Banking in Iowa,” a draft document that establishes procedures for creating a mitigation bank in Iowa.

### **In-Lieu Fee Mitigation**

In-lieu fee mitigation occurs in circumstances where a permittee provides funds to an in-lieu fee sponsor instead of either completing project-specific mitigation or purchasing credits from a mitigation bank approved under the Banking Guidance (Federal Register 2000).

In-lieu fee mitigation, or other similar arrangements wherein funds are paid to a natural resource management entity for implementing either a specific or general wetland or another aquatic resource development project, are not considered to meet the definition of mitigation banking

because these projects do not typically provide compensatory mitigation in advance of project impacts. Moreover, such arrangements do not typically provide a clear timetable for the initiation of mitigation efforts (Federal Register 2000).

The USACE, in consultation with other agencies, may find circumstances for which such arrangements are appropriate, as long as the arrangements meet the requirements that would otherwise apply to an offsite prospective mitigation effort and provide adequate assurances of success and timely implementation. In such cases, a formal agreement between the sponsor and the agencies, similar to a banking instrument, is necessary to define the conditions under which its use is considered appropriate.

#### *Requirements for Using In-Lieu Fee Mitigation*

The requirements for using in-lieu fee mitigation include the following:

1. The permittee must have a USACE-approved mitigation plan, detailing the site, source of hydrology, types of aquatic resources to be restored, success criteria, contingency measures, and an annual reporting requirement. The plan becomes part of the 404 authorization in the form of a special condition (Federal Register 2000, p. 66915)
2. The USACE determines that an in-lieu fee proposal meets the requirements that would otherwise apply to an offsite prospective mitigation effort and provides adequate assurance of success and timely implementation (Federal Register 2000, p.66915).
3. The in-lieu fee management organization must be approved by the USACE in consultation with other federal agencies.
4. A formal agreement, similar to a banking instrument, is necessary to define the conditions under which in-lieu fee mitigation is considered appropriate (Federal Register 2000).
5. If an impact is authorized under an individual permit, the in-lieu fee agreement must be reviewed and approved by the MBRT using the process established for mitigation banks.
6. If an impact is authorized under a Section 404 General Permit, the following conditions apply:
  - a. If onsite or adjacent-site mitigation is available, it is preferred based on the 1990 Memorandum of Agreement on mitigation.
  - b. If there is no practicable opportunity for onsite mitigation or if a bank or in-lieu fee is environmentally preferable, the 1990 Memorandum of Agreement should not preclude use of a bank or in-lieu fee.
  - c. If an authorized impact is within the service area of a mitigation bank, use of the bank is preferred over the use of an in-lieu fee.
  - d. If the authorized impact is within a bank service area and credits are available, but the bank does not provide in-kind mitigation, the authorized impact may be compensated through an in-lieu fee, if the in-lieu fee would provide in-kind restoration as mitigation. In this circumstance, the authorized impact is within the service area of an approved mitigation bank, but the impacted wetland type is not identified by the mitigation banking instrument.
  - e. If the mitigation bank does not provide restoration, creation, or enhancement mitigation and the authorized impact is within the service area of an authorized bank, but the only available credits are from preservation, then the authorized

impact may be compensated through an in-lieu fee arrangement if the in-lieu fee arrangement would provide restoration as mitigation.

7. The qualified organizations should work with the USACE in advance for the following aspects of a project:
  - a. On specific sites where specific types of restoration sites are planned
  - b. On the schedule for implementation
  - c. On the type of mitigation that is most ecologically appropriate for a specific parcel
  - d. On the financial, technical, and legal mechanisms to ensure long-term ecological success
  - e. Additionally, the USACE should ensure that the in-lieu fee arrangements and project authorizations contain distinct provisions that clearly state that the legal responsibility for ensuring that mitigation terms are satisfied fully rests with the organization accepting the in-lieu fee.
8. Proper site selection must be observed. Physical, biological, and chemical characteristics necessary to support the desired aquatic resources and functions, preferably in-kind restoration or creation of impacted aquatic resources, are required.
9. Technical feasibility restoration should be the first option considered for sitting in-lieu fee mitigations. The permittee must submit a plan detailing specific performance standards.
10. Preservation is generally not allowed unless in conjunction with restoration, creation, or enhancement and to augment the functions, whether restored, created, or enhanced.

## IDENTIFICATION OF WETLANDS

The following definition, diagnostic environmental characteristics, and technical approach comprise a guideline for the identification and delineation of wetlands. The EPA (1989) defines wetlands as

those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas.

Wetlands have the following general diagnostic environmental characteristics (each will be described in more detail in the sections that follow):

1. *Vegetation.* The prevalent vegetation consists of macrophytes that are typically adapted to areas having hydrologic and soil conditions described in the definition above. Hydrophytic species, due to morphological, physiological, and/or reproductive adaptations, have the ability to grow, effectively compete, reproduce, and/or persist in anaerobic soil conditions.
2. *Soil.* Soils are present and have been classified as hydric, or they possess characteristics that are associated with reducing soil conditions.
3. *Hydrology.* The area is inundated either permanently or periodically at mean water depths <6.6 ft, or the soil is saturated to the surface at some time during the growing season of the prevalent vegetation.

### Wetland Vegetation

Hydrophytic vegetation is defined herein as the sum total of macrophytic plant life that occurs in areas where the frequency and duration of inundation or soil saturation produce permanently or periodically saturated soils of sufficient duration to exert a controlling influence on the plant species present.

The definition of wetlands includes the phrase “prevalence of vegetation.” Prevalence, as applied to vegetation, is an imprecise, seldom-used ecological term. As used in the wetlands definition, prevalence refers to the plant community or communities that occur in an area at some point in time. Prevalent vegetation is characterized by the dominant species within the plant community or communities. Dominant plant species are those that contribute more to the character of a plant community than other species present, as estimated or measured in terms of some ecological parameter or parameters. The two most commonly used estimates of dominance are basal area (trees) and percent areal cover (herbs).

To classify hydrophytic vegetation, most systems are based on the general characteristics of the dominant species occurring in each vegetation type. These range from the use of general physiognomic categories (e.g., overstory, subcanopy, ground cover, vines) to specific vegetation types (e.g., forest type numbers as developed by the Society of American Foresters).



### *Indicators of Hydrophytic Vegetation*

Several indicators may be used to determine whether hydrophytic vegetation is present on a site. The strongest case for the presence of hydrophytic vegetation can be made when several indicators, such as those in the following list, are present. However, any one of the following indicates that hydrophytic vegetation is present.

1. More than 50% of the dominant species are obligate wetland (OBL), which occur almost always under natural wetlands conditions; facultative wetland (FACW), which usually occur on wetlands but are occasionally found on non-wetlands; or facultative (FAC), which are equally likely to occur on non-wetlands as on wetlands.
2. The following indicators of hydrophytic vegetation may require additional experience and training to use effectively:
  - a. Visual observations of plant species growing in areas of prolonged inundation and/or soil saturation may reveal hydrophytic vegetation.
  - b. Some hydrophytic species have easily recognized morphological characteristics that indicate their ability to occur in wetlands.
  - c. Technical literature is available that may strongly indicate that the plant species comprising the prevalent vegetation are commonly found in areas where soils are periodically saturated for extended periods.
  - d. Botanical journals contain studies that define plant species' occurrence in various hydrologic regimes.
  - e. Government agencies periodically publish technical reports that contain information on plant species' occurrence in relation to hydrologic regimes.
3. Physiological adaptations, which include any features of the metabolic processes of plants that make them particularly fitted for life in saturated soil conditions, may indicate hydrophytic vegetation.
4. Reproductive adaptations on some plant species enable the plants to become established and grow in saturated soil conditions.

### **Wetland Soils**

Soils consist of unconsolidated natural materials that support, or are capable of supporting, plant life. A soil profile consists of various soil layers described from the surface downward. The profile illustrated in Figure 1 describes the soils in terms of horizons (USACE 1987).

1. The A-horizon, the surface soil or topsoil, is a zone in which organic matter is usually being added to the mineral soil.
2. The B-horizon is the zone of maximum accumulation of materials.
3. The C-horizon consists of unconsolidated parent material that has not been sufficiently weathered to exhibit characteristics of the B-horizon.
4. The R-horizon consists of consolidated bedrock.

		DESCRIPTION
ORGANIC HORIZONS	01	ORGANIC MATTER CONSISTING OF VISIBLE VEGETATIVE MATTER.
	02	ORGANIC MATTER IN A FORM WHERE INDIVIDUAL COMPONENTS ARE UNRECOGNIZABLE TO THE NAKED EYE.
	A1	DECOMPOSED ORGANIC MATTER MIXED WITH MINERAL MATTER AND COATING MINERAL PARTICLES, RESULTING IN DARKER COLOR OF THE SOIL MASS. USUALLY THIN IN FOREST SOILS AND THICK IN GRASSLAND SOILS.
	A2	ZONE WHERE CLAY, IRON, OR ALUMINUM IS LOST. GENERALLY LIGHTER IN COLOR AND LOWER IN ORGANIC MATTER CONTENT THAN THE A1 HORIZON.
MINERAL HORIZONS	A3	THESE HORIZONS ARE TRANSITIONAL BETWEEN THE A AND B HORIZONS. THE A3 HORIZON HAS PROPERTIES MORE LIKE A THAN B. THE B1 HORIZON HAS PROPERTIES MORE LIKE B THAN A.
	B1	
	B2	ZONE WHERE THE SOIL LACKS PROPERTIES OF THE OVERLYING A AND UNDERLYING C HORIZONS. GENERALLY THE ZONE OF MAXIMUM CLAY CONTENT AND SOIL STRUCTURE DEVELOPMENT.
	B3	ZONE OF TRANSITION BETWEEN THE B AND C OR R HORIZONS, BUT WITH PREDOMINANT CHARACTERISTICS OF THE B HORIZON.
	C	A MINERAL LAYER, EXCLUSIVE OF BEDROCK, THAT HAS BEEN RELATIVELY LITTLE AFFECTED BY SOIL-FORMING PROCESSES AND LACKS PROPERTIES OF EITHER THE A OR B HORIZONS, BUT WHICH CONSISTS OF MATERIALS WEATHERED BELOW THE ZONE OF BIOLOGICAL ACTIVITY.
	R	CONSOLIDATED BEDROCK, WHICH IS NOT NECESSARILY THE SOURCE OF MINERAL MATTER FROM WHICH THE SOIL FORMED.

**Figure 1. Generalized soil profile**

### *Hydric Soils*

Hydric soils may be classified into two broad categories: organic and mineral. Organic soils develop under conditions of nearly continuous saturation and are commonly known as peats and muck. Mineral soils have a wide range of textures and colors and are periodically saturated for sufficient duration to produce chemical and soil properties associated with reducing the environment.

A drained hydric soil is one in which sufficient ground or surface water has been removed by artificial means, such that the area will no longer support hydrophyte vegetation. Onsite evidence of drained soils includes the following:

1. Presence of ditches or canals of sufficient depth to lower the water table below the major portion of the root zone of the prevalent vegetation
2. Presence of dikes, levees, or similar structures that obstruct normal inundation of an area

3. Presence of a tile system to promote subsurface drainage
4. Diversion of upland surface runoff from an area

### *Indicators for Wetland Soils*

Several indicators determine whether a soil meets the definition of hydric soils. Any one of the following indicates that hydric soils are present:

1. *Organic soils.* More than 50% (by volume) of the upper 32 inches of soil is composed of organic soil material. Otherwise, organic soil includes any organic soil material of any thickness that rests on bedrock.
2. *Histic epipedons.* A histic epipedon is an 8- to 16-inch layer at or near the surface of a mineral hydric soil that is saturated with water for 30 consecutive days or more in most years and contains a minimum of 20% organic matter when no clay is present or a minimum of 30% organic matter when clay content is 60% or greater.
3. *Sulfidic material.* When mineral soils emit an odor of rotten eggs, hydrogen sulfide is present. Such odors are only detected in waterlogged soils that are permanently saturated and have sulfidic material within a few centimetres of the soil surface. Sulfides are produced only in a reducing environment.
4. *Aquic or peraquic moisture regime.* An aquic moisture regime is a reducing one; i.e., it is virtually free of dissolved oxygen because the soil is saturated by groundwater or by water of the capillary fringe (USDA-SCS 1975). Because dissolved oxygen is removed from groundwater by respiration of microorganisms, roots, and soil fauna, the soil temperature is assumed to be above biologic zero (5° C) at some time while the soil is saturated.
5. *Reducing soil conditions.* Soils saturated for long or very long durations will usually exhibit reducing conditions. Under such conditions, ions of iron are transformed from a ferric valence state to a ferrous valence state. This condition can often be detected in the field by a ferrous iron test.
6. *Soil colors.* The colors of various soil components are often an effective diagnostic indicator of hydric soils. The colors of these components are strongly influenced by the frequency and duration of soil saturation, which leads to reducing soil conditions.
  - a. *Gleyed soils* (gray colors). Gleyed soils develop when anaerobic soil conditions result in chemical reduction of iron, manganese, and other minerals, producing gray soil colors.
  - b. *Soils with bright mottles and/or low-matrix chroma.* Mineral hydric soils that are saturated for substantial periods of the growing season (but not long enough to produce gleyed soils) will either have bright mottles and a low-matrix chroma or will lack mottles but have a low-matrix chroma. Mottled means “marked with spots of contrasting color.”
  - c. *Iron and manganese concretions.* During the oxidation-reduction process, iron and manganese in suspension sometimes segregate as oxides. These accumulations are usually black or dark brown.

Three additional soil features may be used as indicators of sandy hydric soils:

1. *High organic matter content in the surface horizon.* Organic matter tends to accumulate above or in the surface horizon of sandy soils that are inundated or saturated to the surface for a significant portion of the growing season.
2. *Streaking of subsurface horizons by organic matter.* Organic matter is moved downward through sand as the water table fluctuates. This movement often occurs more rapidly and to a greater degree in some vertical sections of sandy soil that contain a high content of organic matter than in others.
3. *Organic pans.* As organic matter is moved downward through sandy soils, it tends to accumulate at the point representing the most commonly occurring depth of the water table. This organic matter tends to become slightly cemented with aluminum, forming a thin layer of hardened soil (spodic horizon). These horizons often occur at depths of 12– 30 inches below the mineral surface.

## **Wetlands Hydrology**

Wetlands hydrology encompasses all hydrologic characteristics of areas that are periodically inundated or contain soils that are saturated to the surface at some time during the growing season. In areas with evident characteristics of wetland hydrology, the presence of water has an overriding influence on the characteristics of vegetation and soils due to anaerobic and reducing conditions, respectively.

Numerous factors can influence the wetness of an area, e.g., precipitation, topography, soil permeability, and plant cover. Regardless, the characteristic common to all wetlands is the presence of an abundant supply of water. The water source may be runoff from direct precipitation, headwater or backwater flooding, tidal influence, groundwater, or some combination of these sources. The frequency and duration of inundation or soil saturation varies from near-permanent inundation or saturation to irregular inundation or saturation.

### *Wetlands Hydrology Indicators*

Indicators of wetland hydrology may include, but are not limited to, drainage patterns, drift lines, sediment deposition, watermarks, stream gage data and flood predictions, historic records, visual observation of saturated soils, and visual observation of inundation. Any of these indicators may be evidence of wetlands hydrology.

### *Data Sources*

Data usually provide both short- and long-term information about the frequency and duration of inundation. Recorded data provide evidence of past hydrological events. Other data are obtained from field observations. Data can be obtained from the following sources:

1. *Recorded data.* Data from stream gauges, lake gauges, tidal gauges, flood predictions, and historical information can be obtained from several agencies:
  - a. USACE Offices
  - b. U.S. Geological Survey (USGS)
  - c. State, county, local agencies
  - d. Soil Conservation Service
  - e. Planning documents from developers

2. *Field Data.*

- a. *Visual observation of inundation.* Observing the extent of inundation.
- b. *Visual observation of soil saturation.* Digging soil to determine the level at which water stands in the hole.
- c. *Water marks.* Determining stains on bark and other objects.
- d. *Drift lines.* Observing the deposits of debris along the surface in adjacent vegetation near streams or marshes.
- e. *Sediment deposits.* Observing mineral deposits or other matter on plants after inundation.
- f. *Drainage patterns within wetlands.* Observing evidence of eroded soil, or other matter, in a flow pattern following inundation; scouring around roots of vegetation.

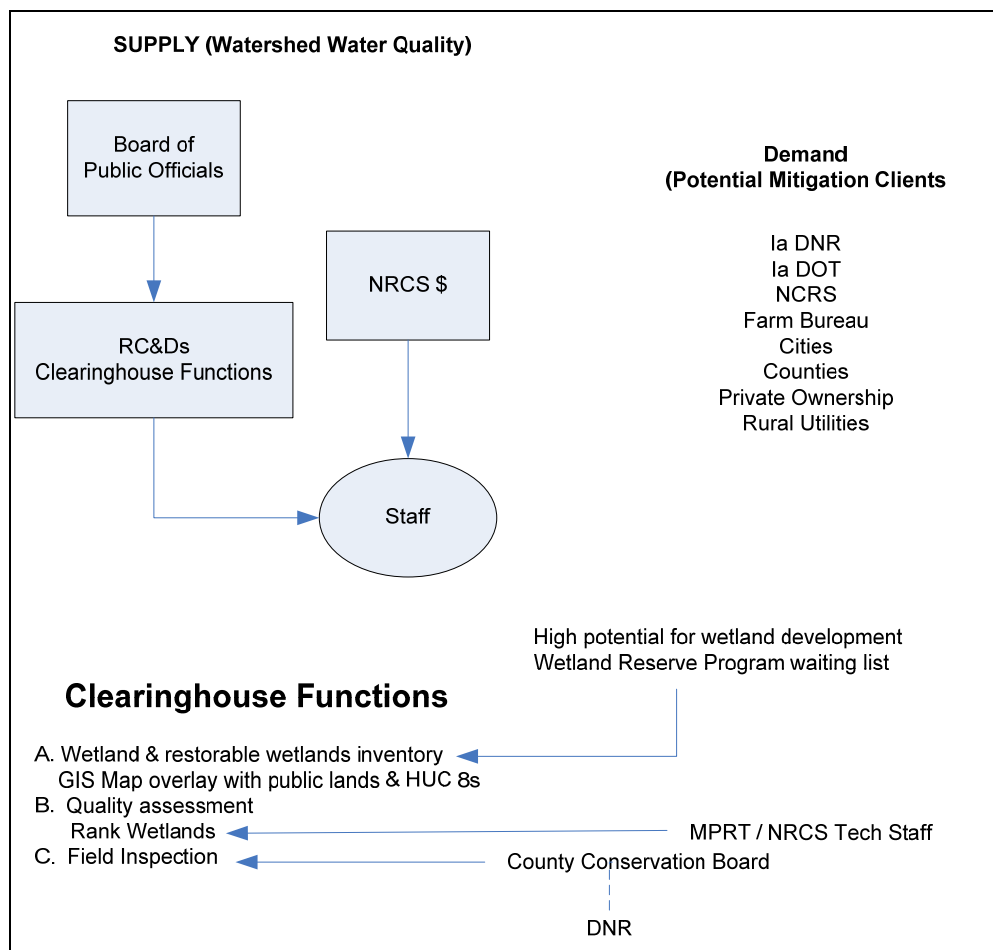
## DEVELOPING THE IOWA WETLAND MITIGATION CLEARINGHOUSE (IWMC) CONCEPT

In May and June 2006, three meetings were held in which the IWMC concept was proposed and developed:

1. Developing the IWMC concept
2. Presenting the IWMC concept to the MBRT
3. Defining the IWMC process

### Developing the IWMC Concept

On May 1, 2006, a meeting was held to investigate the recommendation that a site identification clearinghouse involving the NRCS be established. The result of this meeting was a model of a wetlands banking process, illustrated in Figure 2.



**Figure 2. Pilot wetlands mitigation clearinghouse concept**

The following individuals attended:

- Scott Marler, Iowa DOT
- Jim Cooper, Prairie Rivers of Iowa RC&D
- Mike LaPietra, FHWA Iowa Division
- Christine Schwake, Iowa DNR
- Steve Andrie, CTRE
- Duane Smith, CTRE

Advantages to the clearinghouse concept and the potential products that could be developed are discussed below, along with barriers that may need to be removed, managed, or overcome.

#### *Advantages*

- This concept serves the NRCS in-agency mitigation needs and would fast-track mitigation procedures for the Iowa DOT and the Iowa DNR.
- This concept should result in better mitigation projects in general and an overall coordinated effort.

#### *Potential Products*

- Manageable inventories of potential banking sites and their attributes would be developed and would be envisioned as preservable and restorable.
- Preliminary cost estimates for restoration would be developed. The supply of banking sites would be priced and available for evaluating alternatives.
- A programmatic agreement would be developed and a banker agreement negotiated.
- Long-term monitoring would be available.

#### *Barriers*

- Funding would be required for the initial mapping exercise and for engineering cost estimates.
- Long term funding would be required for administration duties.
- The price for mitigation sites may need to be moved into private ownership and out of government oversight.
- Developing and agreeing upon the determination of these banking sites.

### **Presenting the IWMC Concept to the MBRT**

On May 24, 2006 the research team met with the MBRT to present the IWMC concept.

The following were in attendance:

Mike LaPietra, FHWA Iowa Division  
Scott Marler, Iowa DOT  
Neal Johnson, Corps of Engineers  
Dan Hayes, Corps of Engineers  
Marty Adkins, USDA-NRCS  
Chris Schwake, Iowa DNR  
Gregg Hadish, USDA-NRCS  
Mike Sucik, USDA-NRCS  
Jennifer Anderson-Cruz, USDA-NRCS  
Jim Cooper, Prairie Rivers RC&D/USDA-NRCS  
Anita Maher-Lewis, Prairie Rivers RC&D  
Steve Andrie, ISU/CTRE  
Duane Smith, ISU/CTRE

### *Objective*

The objective of the presentation was to define the concept of a clearinghouse (IWMC) that works with interested parties and agencies to identify cooperative wetlands mitigation areas. The process by which this would be accomplished was not determined, but would require agreement from all of the interested parties and agencies represented on the MBRT.

It was agreed by all in attendance that the IWMC is a worthy concept and should be pursued. At this time, the concept appears to have merit and will provide benefits to many who are required to provide wetlands mitigation.

### *Background*

Jim Cooper discussed the project's background and objectives, including activities that have occurred recently. He concluded by reporting that the conclusion to the IWMC is to pursue and define the process to follow.

### *Research Progress*

Steve Andrie addressed the meeting and presented a status report of the research activities to the group. A study of the feasibility of cooperative wetland mitigation was completed in February 2006. The project was funded by the IHRB at the request of the Iowa DOT, Office of Location and Environment. The purpose of that project was to examine the feasibility of the cooperative development of wetland mitigation projects that serve agencies and communities involved with wetland mitigation.

The principal recommendation of that study was to develop a wetlands clearinghouse to enhance watershed water quality and to provide an available inventory of possible mitigation sites when mitigation is needed. The IHRB report could not be specific about how the clearinghouse would function because a willing third party was needed to move forward with the project.



## *GIS Mapping*

In the spring of 2006, the Prairie Rivers RC&D District expressed interest in being a pilot agency for testing the clearinghouse concept. This opportunity coincides with the recently completed IHRB project to develop a cooperative framework to effectively mitigate small impacts to wetlands resulting from transportation-related projects. The goal of this project was to develop a state-wide in-lieu-fee program (or something similar) to facilitate the cost-effective and efficient mitigation of small impacts. The Iowa Department of Transportation received a \$100,000 grant from the Federal Highway Administration, Office of Project Development and Environmental Review, to conduct this project.

The staff of the Prairie Rivers RC&D is funded by the NRCS. The NRCS has agreed to map wetlands in the counties comprising the Prairie Rivers RC&D as part of the pilot project. (The inventory maps that were presented and discussed are included in Appendix A.) Figure 2 above illustrates a possible organizational structure for a pilot project to inventory wetlands. The Prairie Rivers RC&D would accept the clearinghouse functions using current staff.

Gregg Hadish presented to the committee the GIS mapping that could be used for the wetland mitigation pilot project to be pursued by the Prairie Rivers RC&D District. Hadish is the state GIS specialist for the USDA-NRCS. Following is an outline of Hadish's presentation:

- I. The objectives of the mapping exercise are to ask the following:
  - a. Can GIS be used as a preliminary inventory tool for locating potential wetland mitigation sites?
  - b. Is it feasible to develop a GIS descriptive model of the Prairie Rivers RC&D area using natural resource-based geospatial data?
- II. GIS data and sample maps that were presented included the following:
  - a. NRCS Survey Soil Geographic (SSURGO) soils data (with National Soil Information System [NASIS] attribute data)
    - i. Sample maps: hydric soils, drainage class, ponding frequency
  - b. USDA-Farm Service Agency (FSA) common land unit (CLU) data (field boundaries, Conservation Reserve Program [CRP] fields)
    - i. Sample map: CLU boundaries, CRP areas, NRCS wetland determinations
  - c. ISU stewardship data (parks, conservation areas, public areas)
  - d. NRCS wetland conservation easement data (WRP, Emergency Wetlands Reserve Program [EWRP], Emergency Watershed Protection Program-Flood Plain [EWP-FP])
    - i. Sample maps: Stewardship and conservation easement areas
  - e. NRCS wetland determinations
  - f. Drainage district boundary and infrastructure, drainage tile size
    - i. Sample maps: Drainage district boundaries and infrastructure, drainage tile size
  - g. Iowa DNR remapped National Wetland Inventory (NWI) data
    - i. Sample maps: Remapped NWI
  - h. USGS national hydrographic data set
  - i. Orthophotography (historical 1930s data and current flights)

- j. USGS and LiDAR-delivered digital elevation data
  - i. Sample map: Bear Creek LiDAR shaded relief map with soils
- k. NRCS hydrologic unit boundary
- l. NRCS major land resource area (MLRA)
  - i. Sample map: MLRA and 9-digit hydrologic unit (HU) map

### III. Discussion points included the following:

- a. Some data sets are not available for every Iowa county, or some data sets are incomplete: those of interest would be the remapped NWI, drainage districts, and wetlands determination maps.
- b. It appears logical to select potential sites based on proximity to existing wetlands or natural areas.
- c. In order to narrow the hydric soils, it is logical to use drainage classification and ponding frequency.
- d. Non-funded WRP applications may be a source of landowners who may have an interest in developing a project.
- e. After finding willing landowners, GIS would be used for field-scale analysis.

To illustrate an example of a pilot mitigation project, an Iowa DOT mitigation project is being considered in the pilot district. The results of a mapping exercise and the GIS overlays (such as Hadish had completed for this meeting) would be compared to the Iowa DOT mitigation need. It could then be determined whether there is a geographic match between the need for mitigation and the location where it could occur. We may ask whether they are close enough to meet the requirements.

The advantages of the pilot project might include the following:

- This concept serves the NRCS's in-agency mitigation needs, as well as the mitigation, restoration, and preservation needs of the Iowa DOT and the Iowa DNR.
- This concept should result in sustainable mitigation projects in general and facilitate and an overall coordinated watershed improvement effort.

Potential products could include the following:

- Manageable inventories of potential mitigation and/or restoration sites and their attributes could be developed and would be envisioned as preserved and restorable.
- The preliminary cost estimate for restoration would include pricing the supply of wetland sites and making the cost data available for evaluating alternatives.
- A programmatic agreement would be developed and a banking agreement negotiated
- Long-term monitoring would be available.

Barriers may include the following:

- Funding would be required for the initial mapping exercise and for engineering cost estimates.
- Long-term funding would be required for administration duties.
- The price for mitigation sites may need to be moved into private ownership and out of government oversight.
- Developing and agreeing upon the determination of these banking sites may be difficult.

- It may be difficult to identify all of the potential partners in the pilot project area.

Cooperative opportunities exist for the following:

- Field evaluations and technical assessments based on initial GIS work
- Cost estimates for restoration and preservation
- Management and monitoring needs
- Pilot project to test concepts

### *Public Interest Review*

One aspect of the research would be a review of public interest, including the following activities:

1. A banking statement, agreement, or cooperative umbrella instrument (CUI) that includes sites identified, compatible soils, and hydrology data would be developed as an umbrella that all interested parties (all who may need mitigation sites) can work under.
2. A public notice process for those required to obtain 402 permits is necessary.
3. A need assessment is required.

### *IWMC Considerations for Implementation*

The following thoughts were expressed by those in attendance:

- Think about the sites as that are considered for development and don't develop sinks.
- What do we mean when we use the term "high quality"?
- What would be the selection factors?
- Wildlife benefits may be another goal.
- Functional assessment processes do not exist at this time, but there are agreed upon principles to work from. There are ways to tell that we know what is good.
- The process on the table should lead to better mitigation projects
- Using a special area management plan is in the regulations. The plan requires an environmental impact statement (EIS) first (on the mitigation site; the USACE does not fund this EIS). Then, when a permit comes in, the USACE could award mitigation using these sites, the management plan, and the EIS as documentation.
- A pilot project would fall in the middle of acquiring a 402 permit. Gregg Hadish's mapping examples show that there is potential for this concept to work well.
- There is a potential to develop an inventory of high-quality potential sites, both preservable and restorable for mitigation and other purposes.
- There is a potential for an umbrella-type agreement, but it doesn't identify the sites specifically. It would be a charter CUI, an agreed-to process for mitigation. Several details are developed at the beginning of a CUI.
- The committee will look for other stakeholders that have other agendas and join all of the interests together to add value to mitigation.

## **Defining the IWMC Process**

The following personnel attended a meeting on June 21, 2006 for the purpose of defining a process the IWMC would follow during a pilot project application.

Mike La Pietra, Iowa Division FHWA  
Scott Marler, Iowa DOT  
Jim Cooper, Prairie Rivers RC&D / USDA – NRCS  
Anita Maher-Lewis, Prairie Rivers RC&D  
Duane Smith, ISU/CTRE

The clearinghouse concept objectives were classified under either research or project-specific demonstration and implementation. The specific objectives were defined as follows:

### *Research*

1. Develop an inventory for the six-county region that includes Webster, Hamilton, Hardin, Boone, Story, and Marshall. This inventory will likely include the following information:
  - a. The individual county inventories
  - b. Wetlands attributes such as
    - i. Soils classification
    - ii. Ownership (public or private)
    - iii. Classification of the wetland
2. Write a final CTRE research report that will include the following:
  - a. A template CUI
  - b. A discussion of the pilot project

### *Project-Specific Demonstration and Implementation*

3. A pilot project should include the following:
  - a. Applying the agreement template developed in the research
  - b. Developing a cost estimate that would normally include the following:
    - i. Administration
    - ii. Design
    - iii. Right of way
    - iv. Construction
    - v. Maintenance and monitoring
4. Field visit(s) will be conducted by the wetland mitigation board of the site(s) identified for the pilot project.

To document the development of the IWMC concept, the following will define success in the following terms:

1. A final research report that includes the following:
  - a. Documentation of the research project
  - b. Template CUI
  - c. Discussion of the pilot project

2. Completion of the project-specific demonstration and implementation tasks

## **MAP INVENTORY: SIX COUNTIES OF THE PRAIRIE RIVERS OF IOWA RESOURCE CONSERVATION AND DEVELOPMENT DISTRICT**

This section describes the data available for the initial mapping stages of the potential pilot clearinghouse mitigation project to be sponsored by the Federal Highway Administration, Office of Project Development and Environmental Review. The Prairie Rivers RC&D District volunteered to host the pilot project and agreed to map the wetlands in the counties comprising the Prairie Rivers RC&D District. The typical inventory maps that would be used are included in Appendix A and discussed briefly below. These samples were provided by the United States Department of Agriculture, Natural Resource Conservation Service.

Wetlands are classified by vegetation that is growing in the area, the soil classifications and the wetland hydrology. To evaluate the vegetation it is most common to visit the site and do an inventory of the plant species growing in the wetland area. The survey would attempt to document a prevalence of vegetation typically adapted for life in saturated soil conditions. On the other hand, recorded data is frequently available for the soil classification and the wetland hydrology. Following are discussions of the GIS mapping available from the USDA-NRCS GIS office in Des Moines.

### **Soils Classification**

The soils that are present in a wetland area have been classified as hydric, or they possess characteristics that are associated with reducing soil conditions. These soils consist of unconsolidated natural materials that support, or are capable of supporting, plant life. Hydric soils are classified into two broad categories: organic and mineral. There are several indicators, as discussed in identification of wetlands section of this report, that determine whether a soil meets the definition of hydric soils. On page 31-32 in the appendix the GIS mapping shows soil classification. One map is for the 6 county Prairie Rivers area and the second was printed at the county (Marshall) level. They are prime examples that illustrate the soils information that is already in existence and available as a resource for wetland soil classification.

### **Wetland Hydrology**

Wetlands hydrology encompasses all hydrologic characteristics of areas that are periodically inundated or contain soils that are saturated to the surface at some time during the growing season. Numerous factors can influence the wetness of an area, e.g., precipitation, topography, soil permeability, and plant cover. Indicators of wetland hydrology may include, but are not limited to, drainage patterns, drift lines, sediment deposition, watermarks, stream gage data and flood predictions, historic records, visual observation of saturated soils, and visual observation of inundation.

In the appendix on Page 32 the drainage classification GIS maps are for the 6 county Prairie Rivers area. The classifications include well drained, excessively drained, moderately well drained, somewhat excessively drained, somewhat poorly drained, poorly drained and very poorly drained. On page 34 is a map of Hamilton County showing the poorly drained soils. A LiDAR shaded relief map is shown on page 35 and uses shading to illustrate the terrain relief for

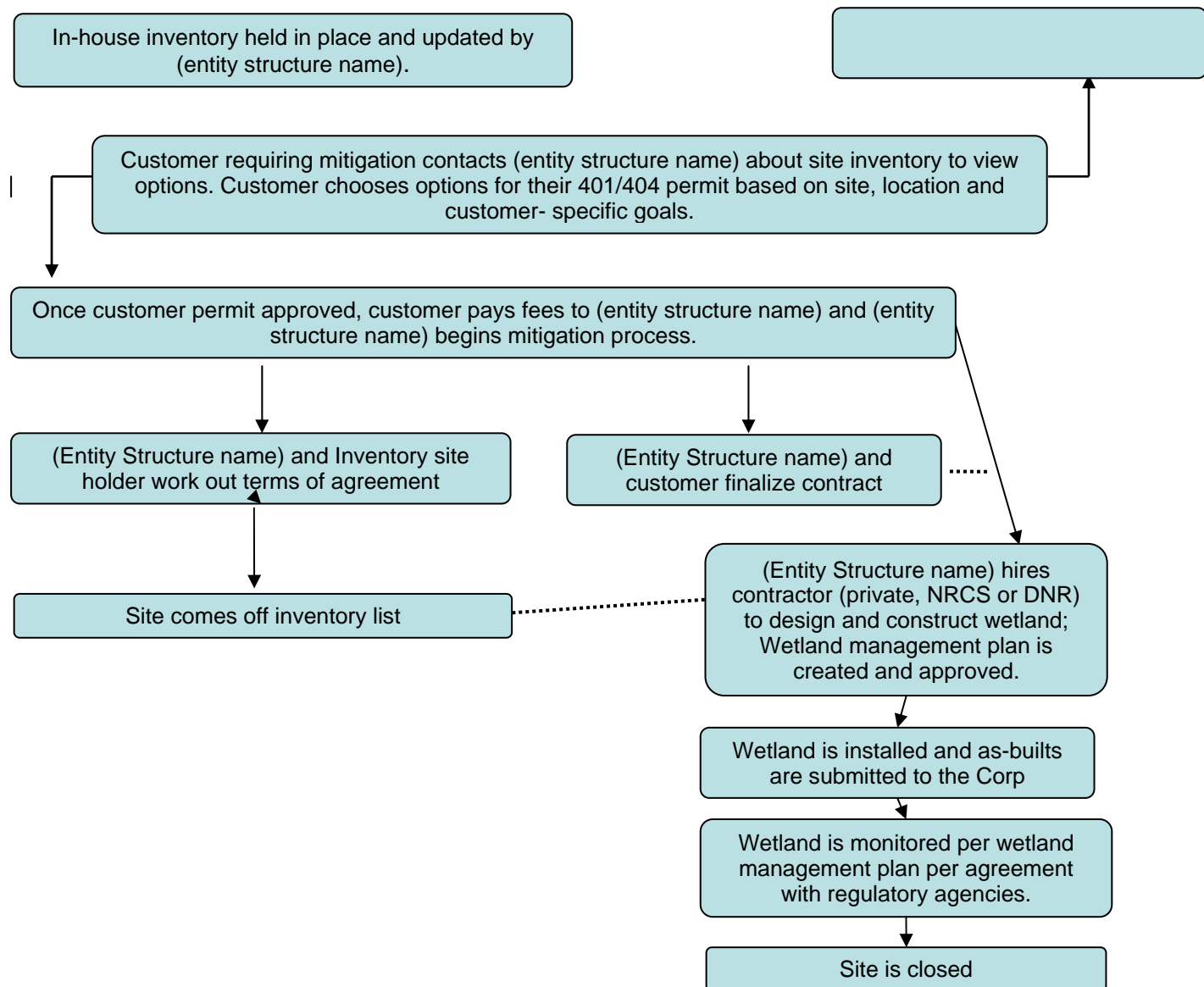
high to low. This is helpful to determine the direction of drainage and the size of drainage areas.  
Prairie Rivers RC&D

### **Ownership**

Once the soil and hydrology facts are known in an area, the next step would be to determine the ownership. There are several sources of this data and some of it has been mapped on GIS based maps. In the appendix are several examples which include: page 36 is the 6 Prairie Rivers 6 counties that illustrate whether the land is a wetland conservation easement, a park or conversation area or Prairie Rivers RC&D; on page 37 is a map of Story County showing parks and conservation areas and on page 38 and 39 we find drainage district data; and on Page 40 is the mapping for the Natural Wetlands Inventory. On the following maps (Page 41-45) is a sampling of other data that is available on GIS maps.

## PILOT PROJECT DEFINITION

To illustrate the mitigation clearinghouse concept, an Iowa DOT mitigation pilot project was planned in the Prairie Rivers RC&D District. The flowchart presented in Figure 3 demonstrates the way a project would function after the banking statement, agreement, or CUI is accepted by all parties (see the template CUI in Appendix B).



**Figure 3. Illustrative flowchart of the mitigation clearinghouse process**



## Mitigation Activity Description

As Figure 3 shows, a customer requiring mitigation first contacts the mitigating entity to view options about site inventory. The customer then chooses options for the 401/404 permit based on site, location, and customer-specific goals. When the customer's permit is approved by the appropriate regulatory agencies, the customer pays mitigation fees to the mitigating entity, the contract is finalized between the two parties, and the mitigating entity begins the mitigation process. The mitigating entity then hires a contractor (private, NRCS, or DNR) to design and construct the wetland, and the wetland management plan is created and approved. The wetland is then installed and as-built specifications are submitted to the USACE. The wetland is monitored as per the wetland management plan, as specified in the agreement with the regulatory agencies. Finally, the site is closed.

While the mitigating entity is completing the above process with the customer, the mitigating entity completes an agreement with the inventory site holder and the site is removed from the inventory list.

## Approaches to Wetland Mitigation

The approach used for wetlands mitigation will vary, based on the area in question. There are two basic approaches: routine and comprehensive.

1. *Routine approach.* The routine approach will normally be used in the vast majority of determinations. The routine approach requires a minimal level of effort, using primarily qualitative procedures. This approach can be further subdivided into three levels of required effort, depending on the complexity of the area and the amount and quality of preliminary data available. The following levels of effort may be used for routine determinations:
  - a. *Level 1.* Onsite inspection unnecessary.
  - b. *Level 2.* Onsite inspection necessary.
  - c. *Level 3.* Combination of levels 1 and 2.
2. *Comprehensive approach.* The comprehensive approach requires application of quantitative procedures for making wetland determinations. It should seldom be necessary, and its use should be restricted to situations in which the wetland is very complex and/or is the subject of likely or pending litigation. Application of the comprehensive approach requires a greater level of expertise than application of the routine approach, and only experienced field personnel with sufficient training should use this approach.

## Summary Recommendations

The following are the summary recommendations for this research project.

1. Complete the pilot project for the purpose of testing the brokerage concept. This would be the first two boxes in figure 3.
2. Utilize the RC&D as the mitigation agent because they have paid staff already in place, they are governed by a public official board and the RC&D can accept this role because

of this good combination and they are established across Iowa

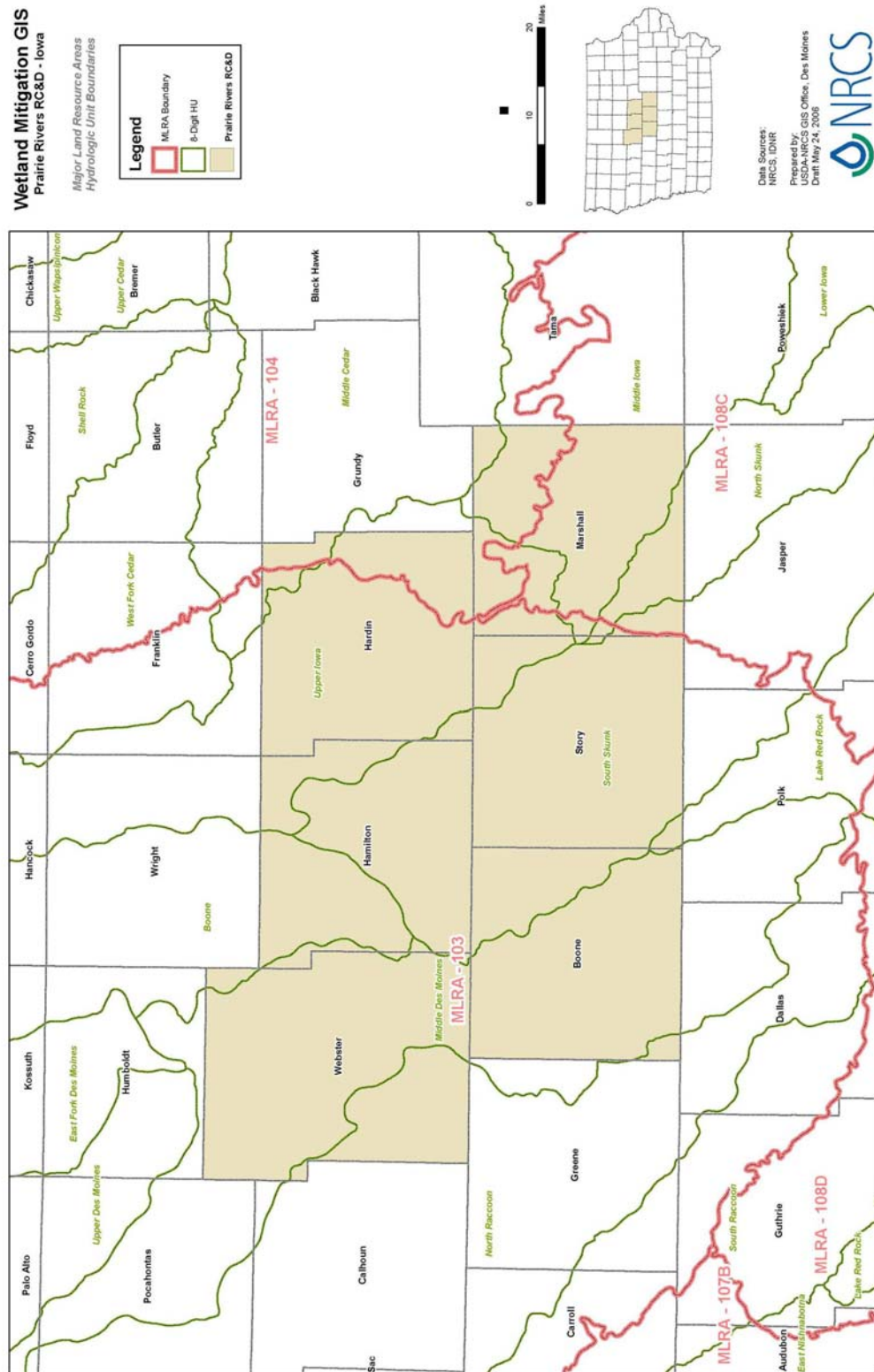
3. Contract with Prairie Rivers RC&D for a mitigation pilot project
4. Use the RC&D as a statewide model
5. Work with the DNR on service area definitions
6. Develop a users handbook for those new to using the RC&D in the mitigation process

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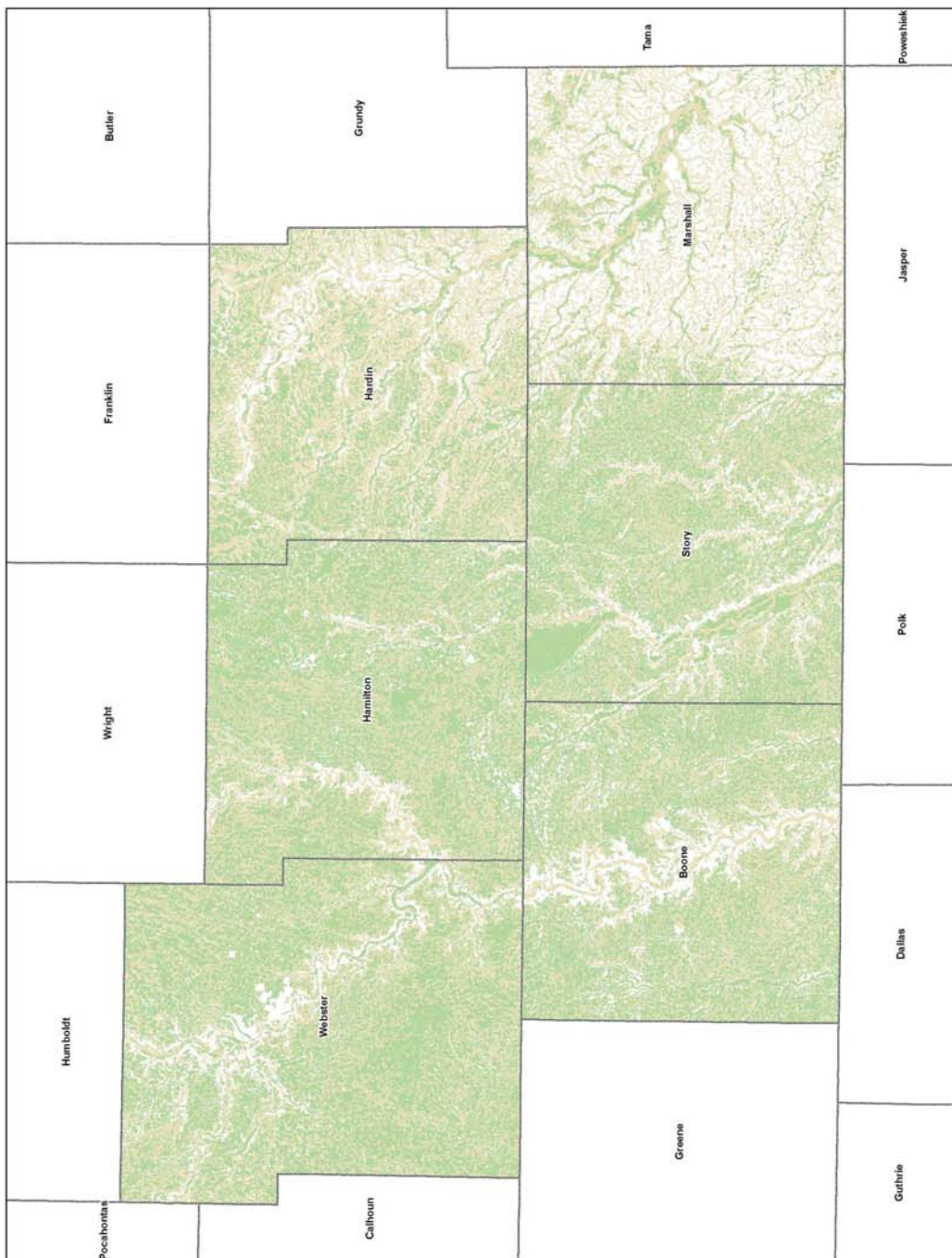
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# APPENDIX A. MITIGATION BANKING MAPS IN IOWA



# Wetland Mitigation GIS Prairie Rivers RC&D - Iowa



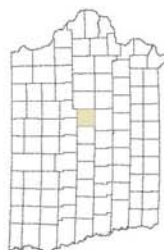
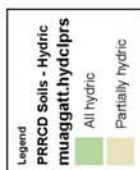
Data Sources:  
 IDNR, NRCS

Prepared by:  
 US NRCS GIS Office, Des Moines  
 Draft May 24, 2006

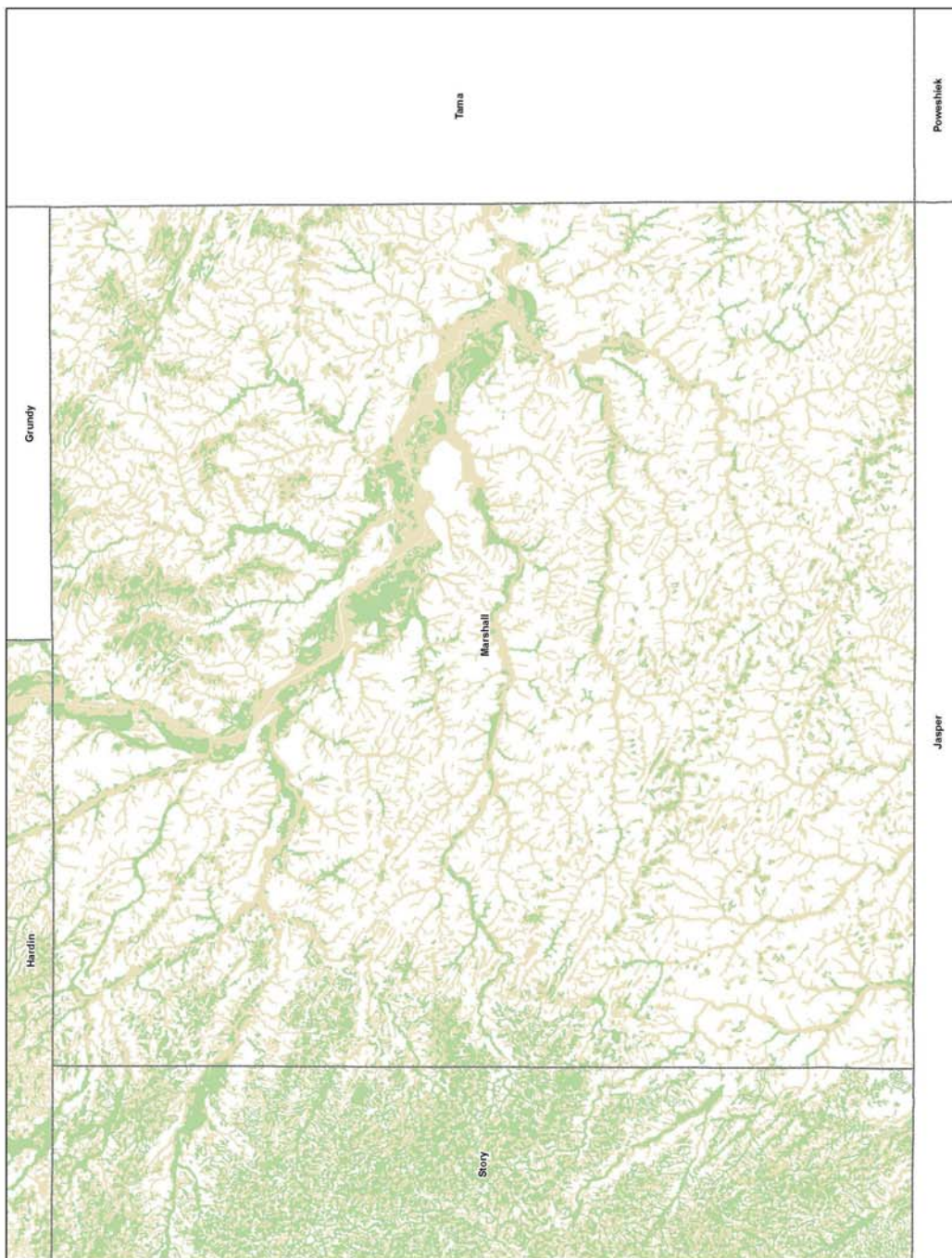


# Wetland Mitigation GIS Prairie Rivers RC&D - Iowa

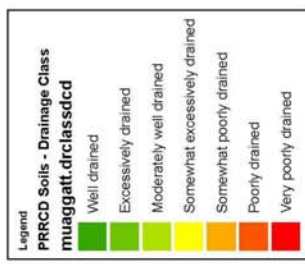
Hydric Soils from SSURGO



Data Sources:  
 NRCS SSURGO  
 Prepared by GIS Office, Des Moines  
 Draft May 24, 2006

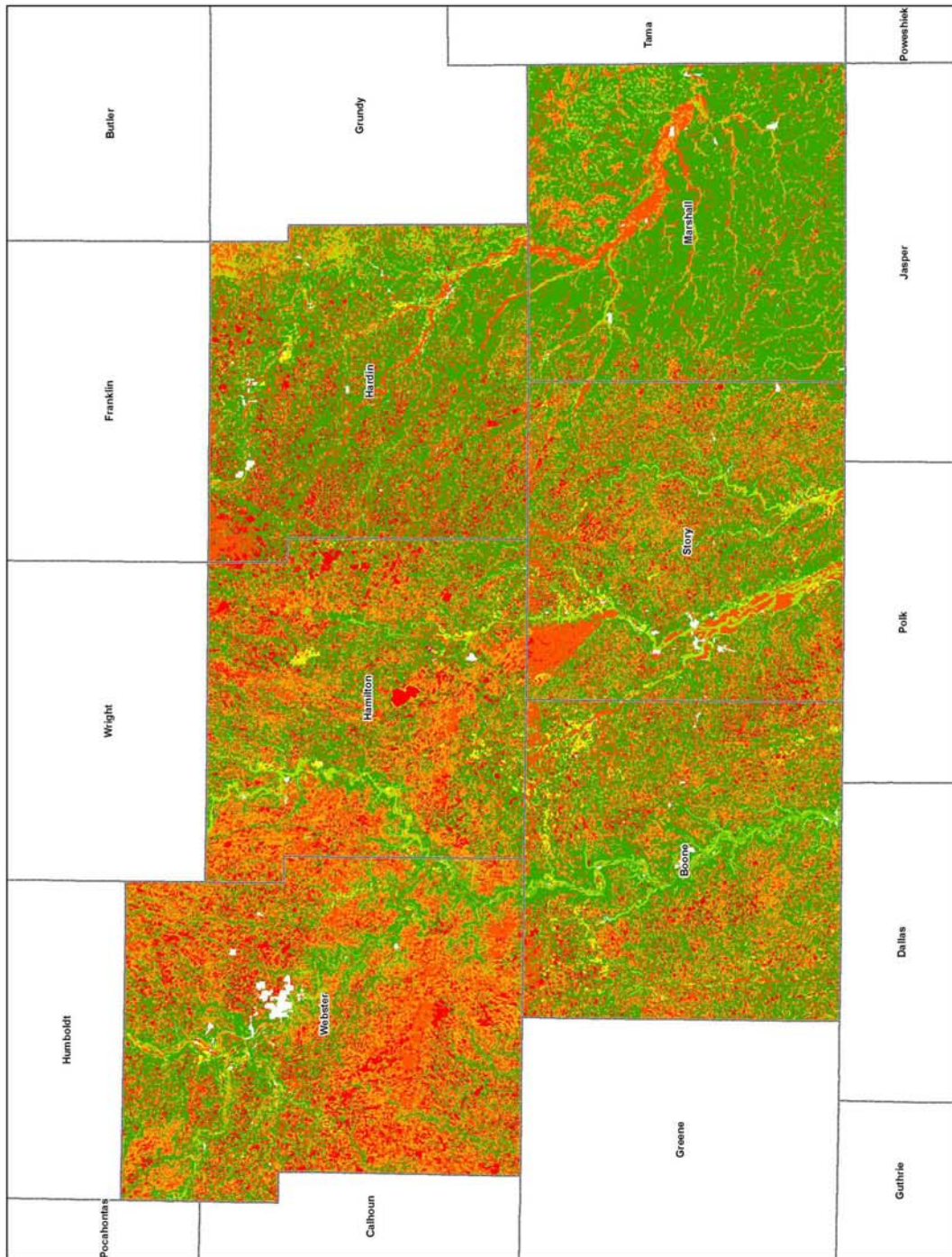


# Wetland Mitigation GIS Prairie Rivers RC&D - Iowa Drainage Class from SSURGO



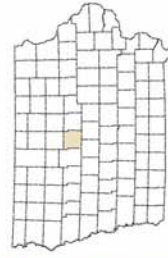
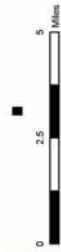
Data Sources:  
 IDNR, NRCS

Prepared by:  
 USDA-NRCS GIS Office, Des Moines  
 Draft May 24, 2006

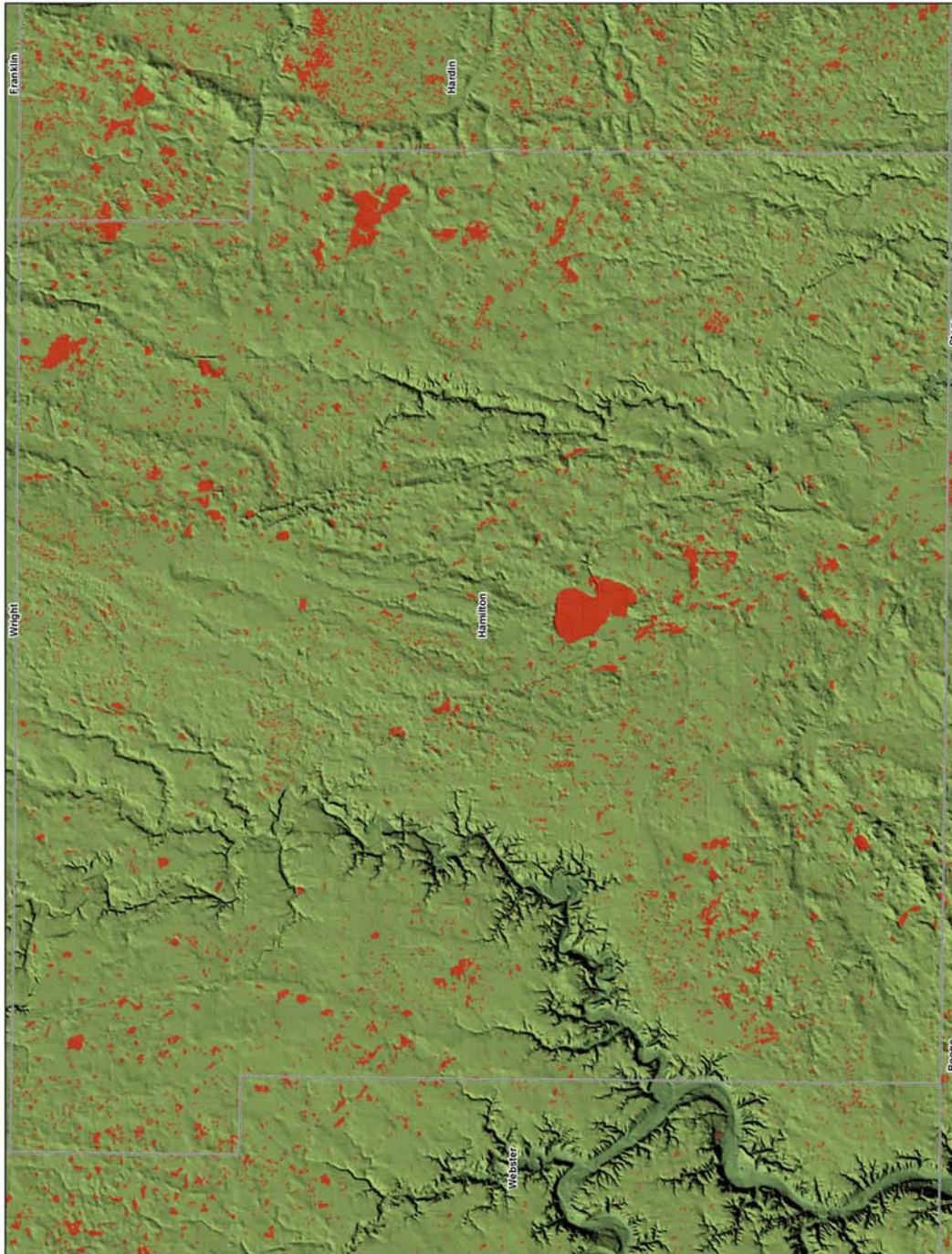




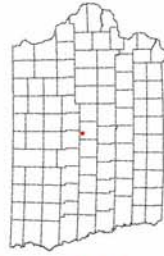
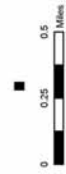
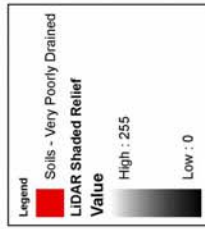
**Wetland Mitigation GIS**  
**Prairie Rivers RC&D - Iowa**  
 Drainage Class from SSURGO  
 USGS NED Shaded Relief



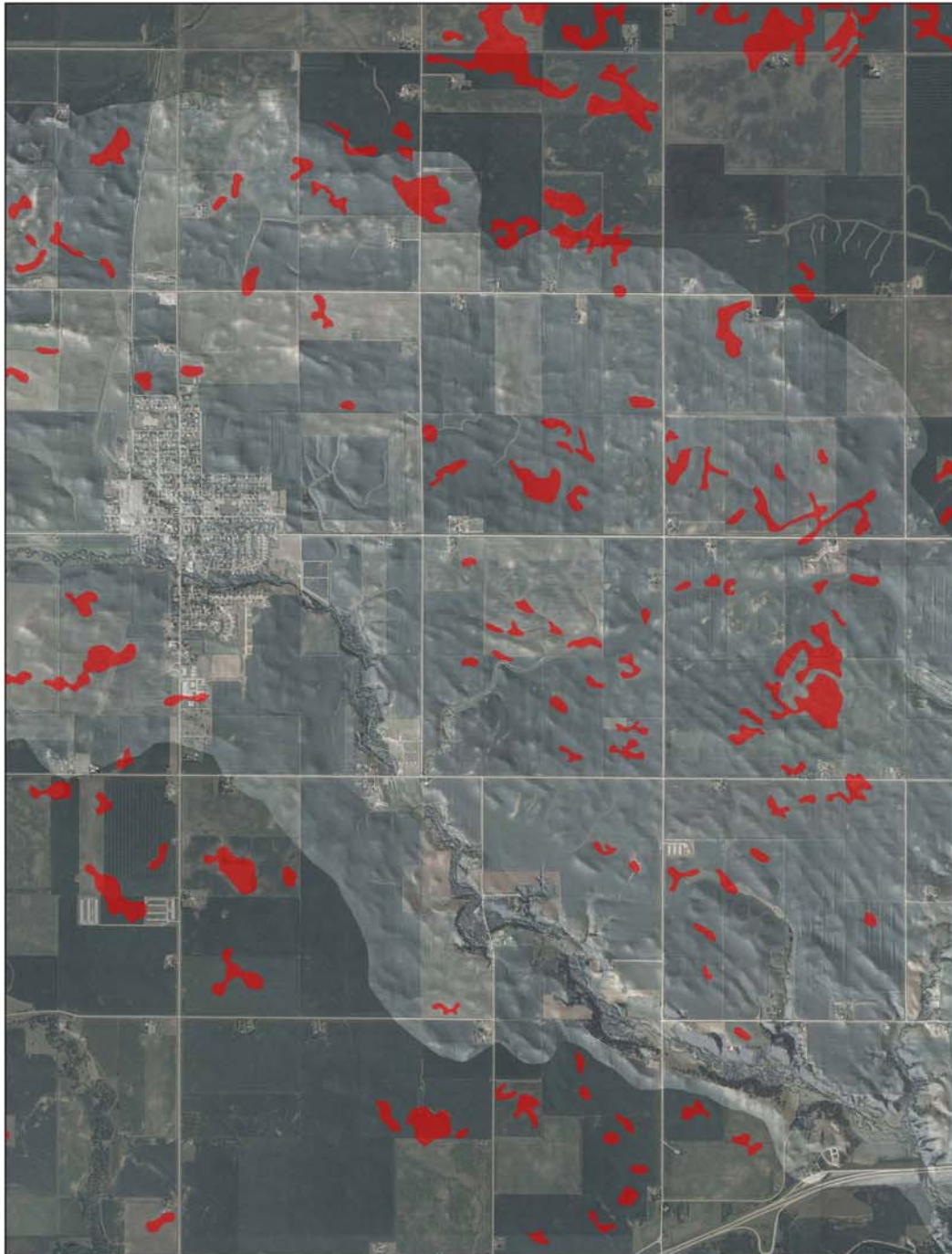
Data Sources:  
 NRCS SSURGO, IDNR  
 Prepared by:  
 USDA-NRCS GIS Office, Des Moines  
 Draft May 24, 2006



**Wetland Mitigation GIS**  
**Prairie Rivers RC&D - Iowa**  
 Soils and LIDAR Shaded Relief  
 2005 NAIP



Data Sources:  
 NRCS SSURGO, IDNR  
 Prepared by:  
 USDA-NRCS GIS Office, Des Moines  
 Draft May 24, 2006

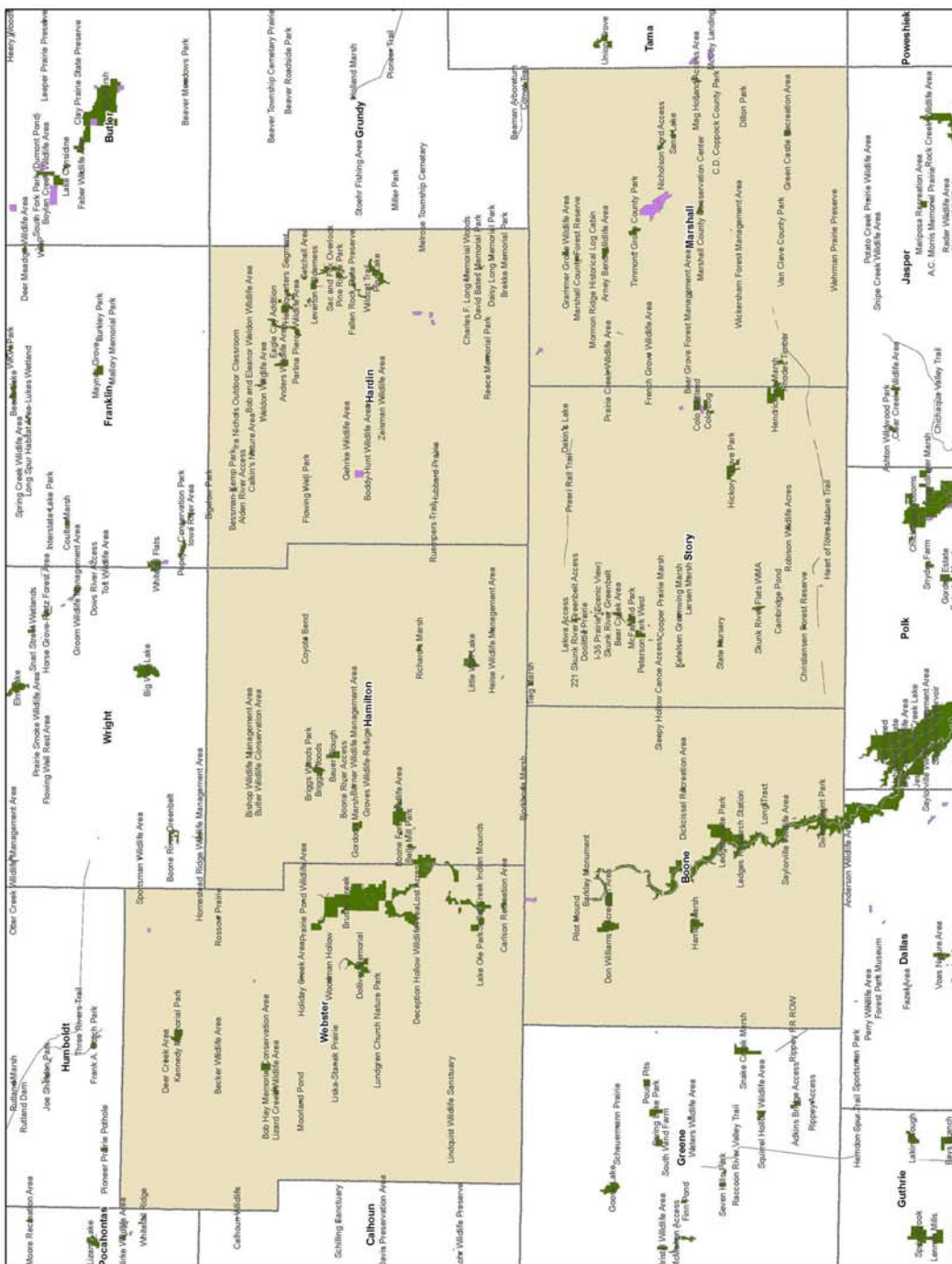




### Parks and Conservation Areas

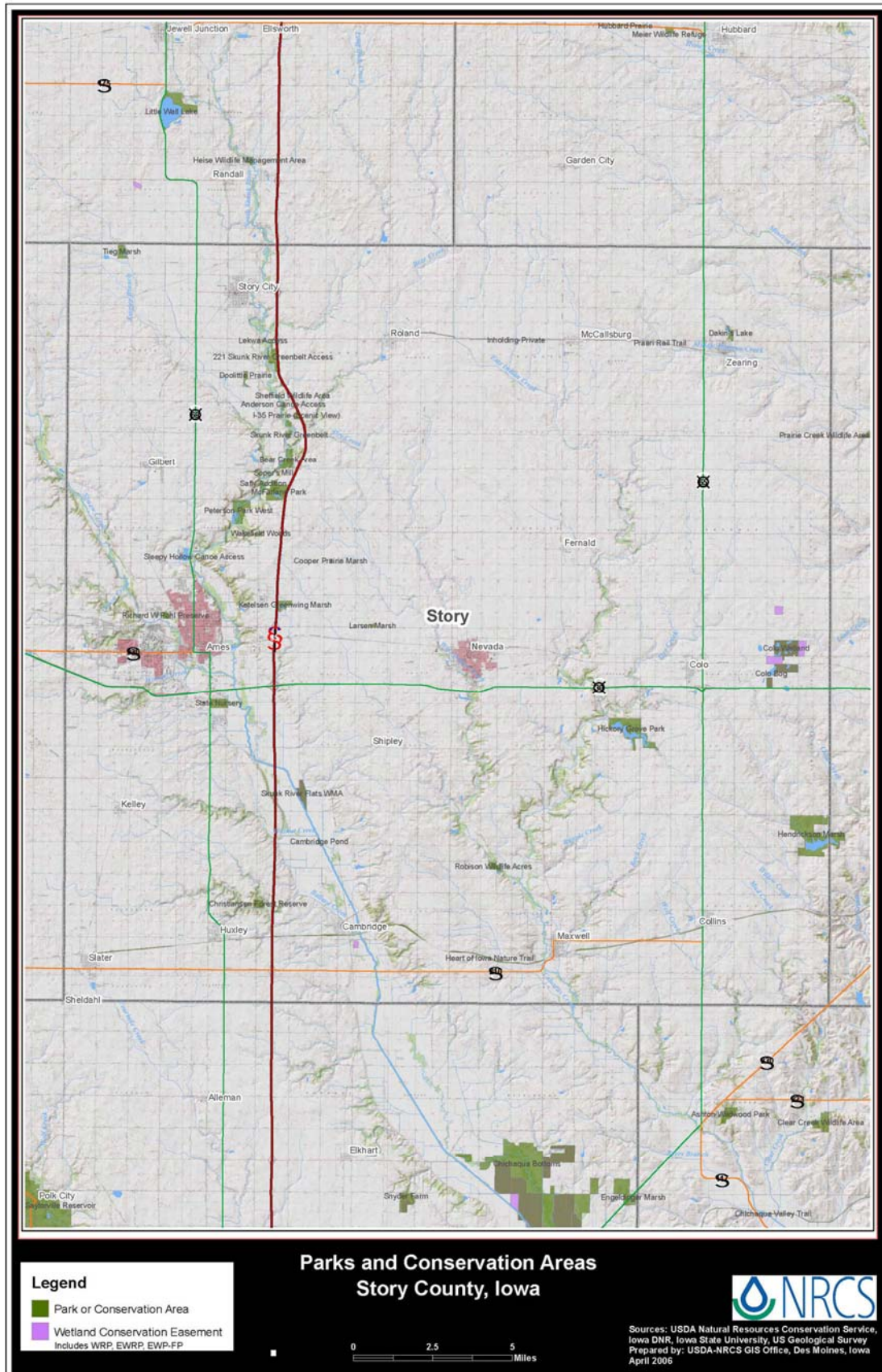
**Legend**

- Wetland Conservation Easement
- Park or Conservation Area
- Prairie Rivers RC&D



Data Sources:  
DNR, NRCS  
Prepared by  
USDA-NRCS GIS Office, Des Moines  
Draft May 24, 2006

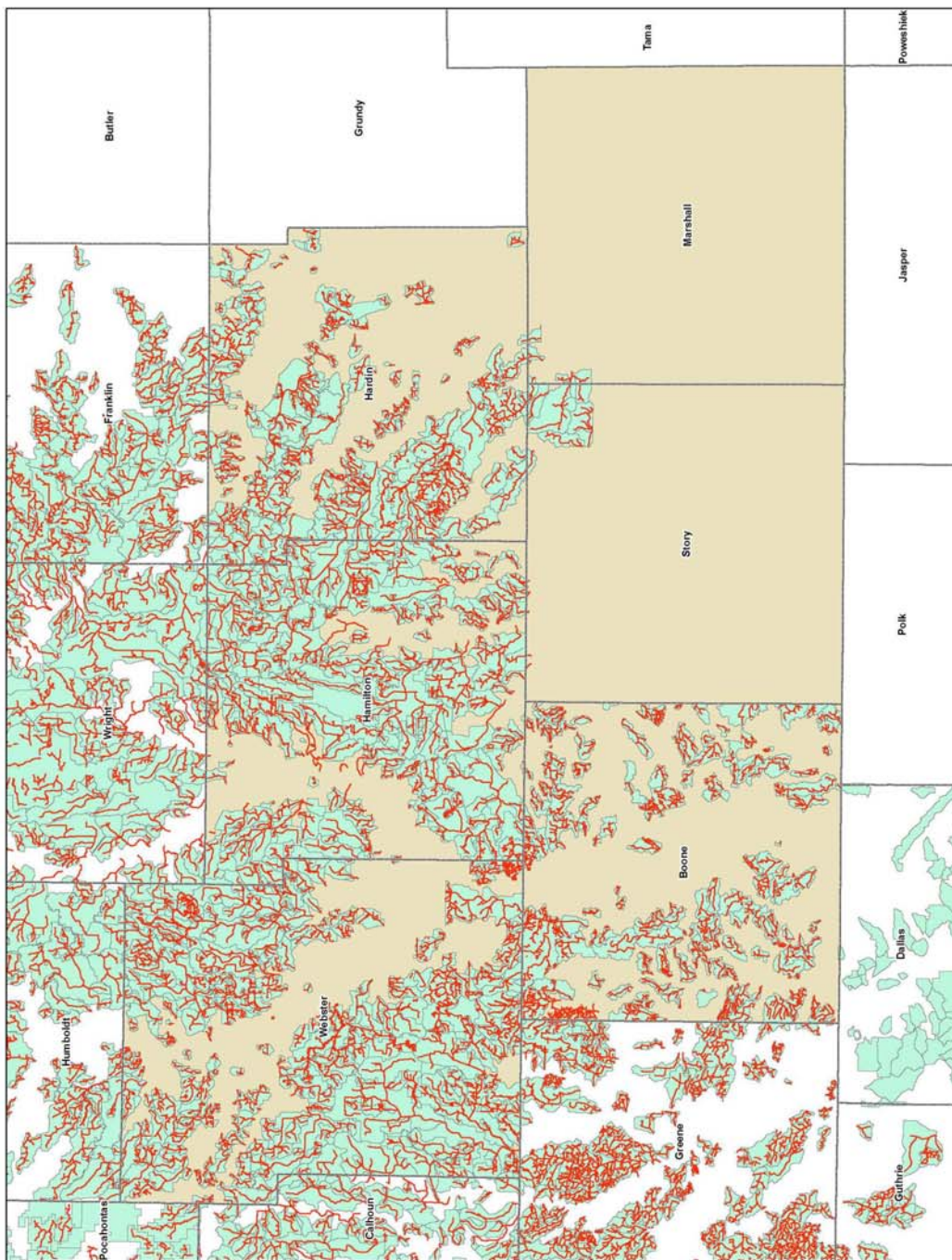






# Wetland Mitigation GIS Prairie Rivers RC&D - Iowa

Drainage District Data

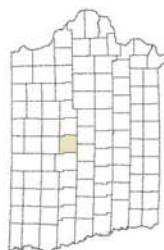
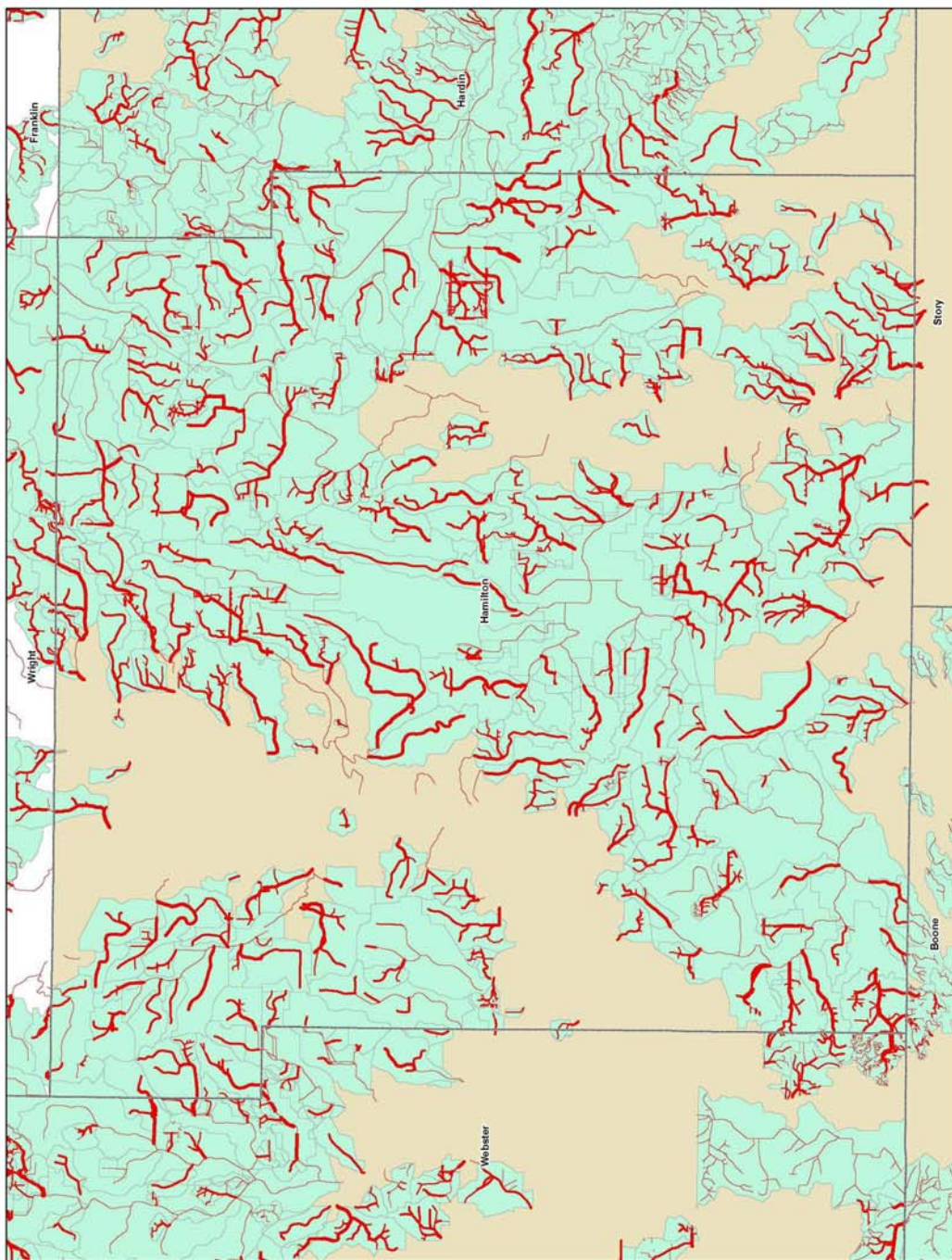
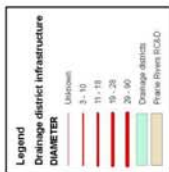


Data Sources:  
 IDNR, NRCS

Prepared by:  
 IDNR, NRCS GIS Office, Des Moines  
 Draft May 24, 2006

# Wetland Mitigation GIS Prairie Rivers RC&D - Iowa

Drainage District Data



Data Sources:  
IDNR, NRCS

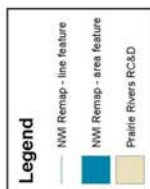
Prepared by GIS Office, Des Moines  
IDNR, NRCS  
Draft May 24, 2006

**NRCS**



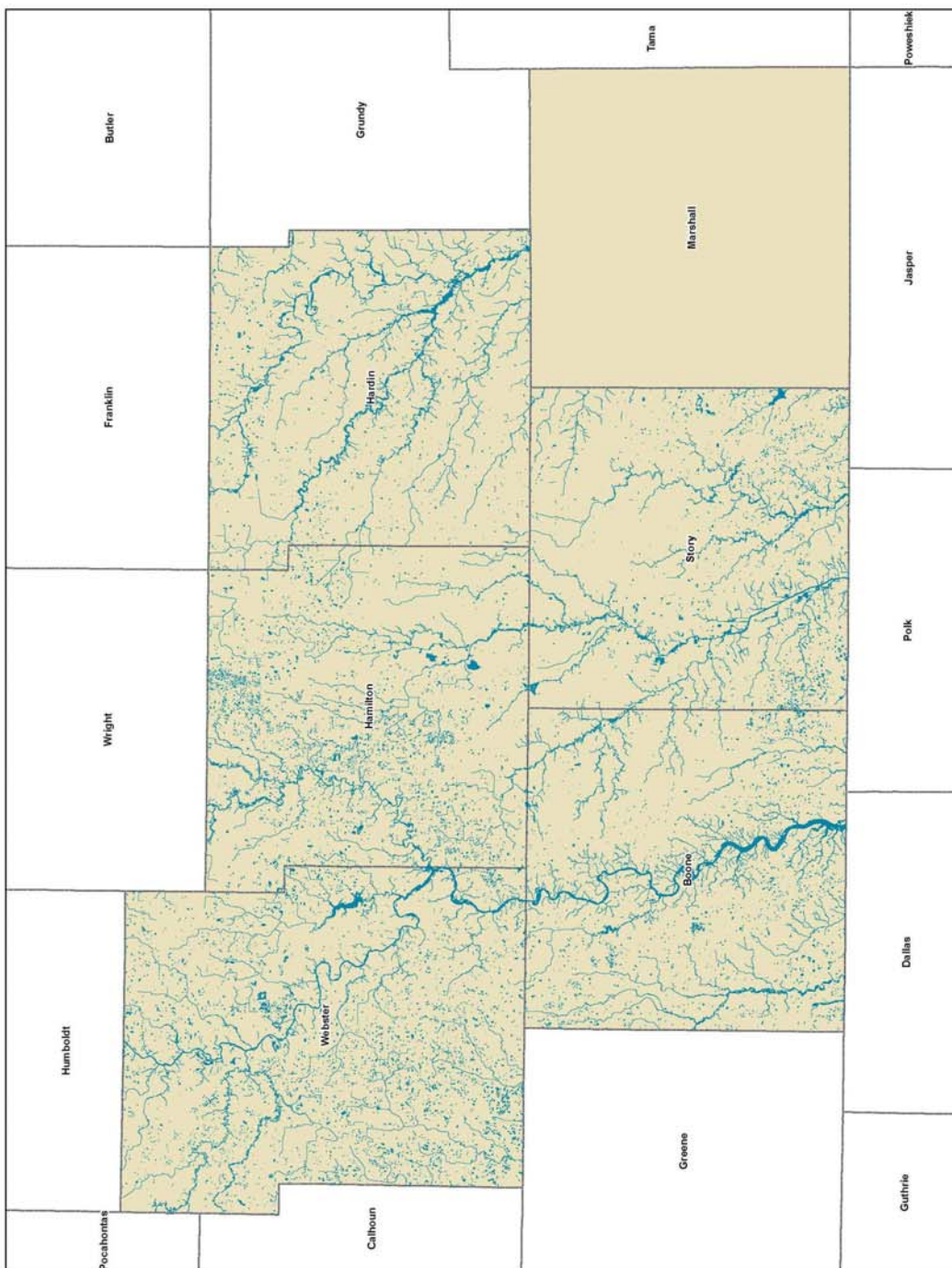
# Wetland Mitigation GIS Prairie Rivers RC&D - Iowa

National Wetlands Inventory - IDNR

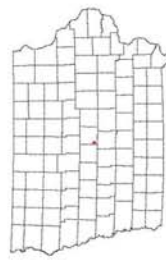
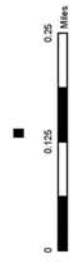


Data Sources:  
NRCS, IDNR

Prepared by:  
USDA-NRCS GIS Office, Des Moines  
Draft May 24, 2006



**Wetland Mitigation GIS**  
**Prairie Rivers RC&D - Iowa**  
 National Wetlands Inventory - IDNR  
 1939 USDA Aerial Photos

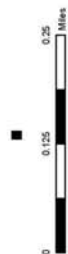
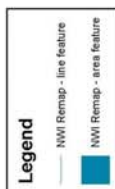


Data Sources:  
 NRCS, IDNR  
 Prepared by:  
 USDA-NRCS GIS Office, Des Moines  
 Draft May 24, 2006

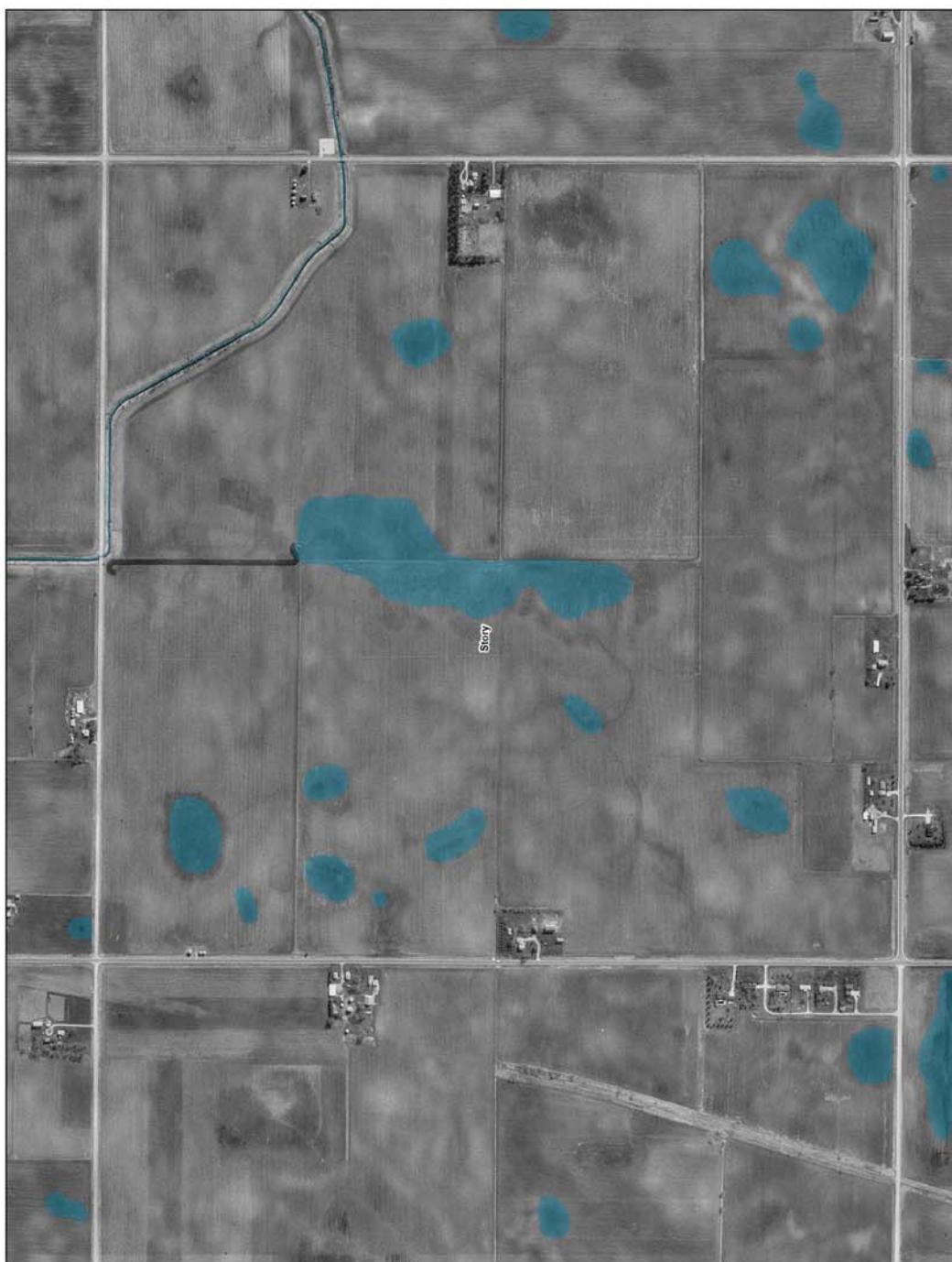




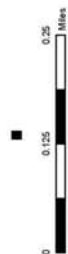
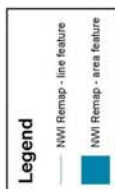
**Wetland Mitigation GIS**  
**Prairie Rivers RC&D - Iowa**  
 National Wetlands Inventory - IDNR  
 1994 USGS DOQQ



Data Sources:  
 NRCS, IDNR  
 Prepared by:  
 USDA-NRCS GIS Office, Des Moines  
 Draft May 24, 2006



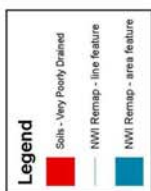
**Wetland Mitigation GIS**  
**Prairie Rivers RC&D - Iowa**  
 National Wetlands Inventory - IDNR  
 2002 Color Infrared DOQQ



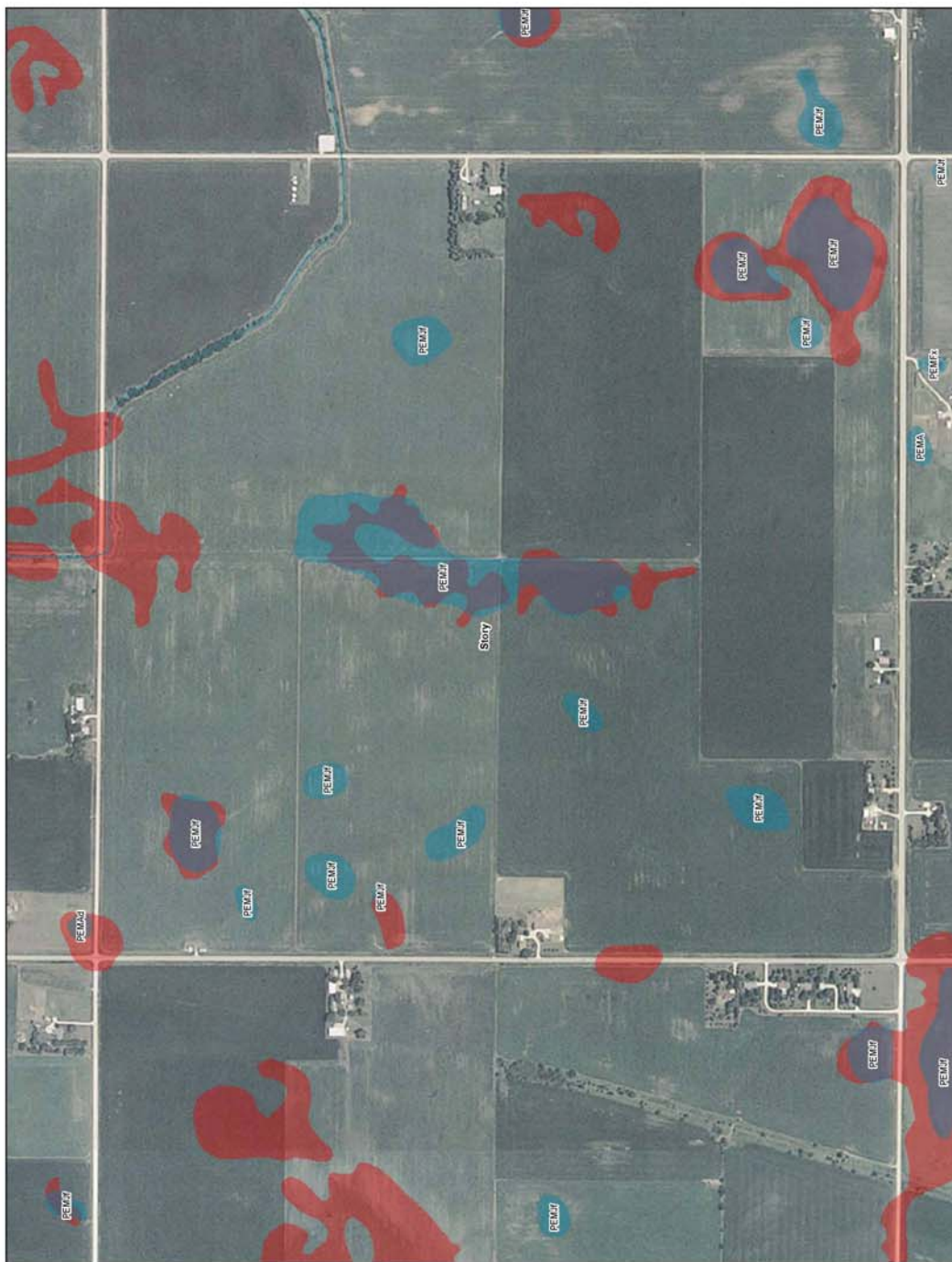
Data Sources:  
 NRCS, IDNR  
 Prepared by:  
 USDA-NRCS GIS Office, Des Moines  
 Draft May 24, 2006



**Wetland Mitigation GIS**  
**Prairie Rivers RC&D - Iowa**  
 National Wetlands Inventory - IDNR  
 SSURGO Very Poorly Drained Soils  
 2005 USDA NAIP Imagery



Data Sources:  
 NRCS, IDNR  
 Prepared by:  
 USDA-NRCS GIS Office, Des Moines  
 Draft May 24, 2006





## APPENDIX B. COOPERATIVE UMBRELLA INSTRUMENT

### Cooperative Umbrella Instrument *Entity Structure Name*

#### Table of Contents

General .....	1
I. <b>Purpose</b> .....	2
II. <b>Organizational Structure of the Wetland Mitigation</b> .....	2
III. <b>Geographic Service Area</b> .....	3
IV. <b>Project Implementation</b> .....	3
V. <b>Land Ownership</b> .....	3
VI. <b>Accounting Procedures</b> .....	3
VII. <b>Performance Standards for Success</b> .....	4
VIII. <b>Reporting Protocols and Monitoring Plan</b> .....	4
IX. <b>Contingency and Remedial Actions and Responsibilities</b> .....	5
X. <b>Financial Assurances</b> .....	6
XI. <b>Provisions for Long-Term Management and Maintenance</b> .....	6
XII. <b>Responsibilities of the MBRT</b> .....	7
XIII. <b>Other Provisions</b> .....	8
Exhibit A      Service Area	
Exhibit B      Interagency Agreement	
Exhibit C      Legal Description of Sites as they enter into agreements.	
Exhibit D      Wetland Restoration and Management Plans for each sites – Ex: Coulter Marsh Franklin County, Iowa.	
Exhibit E      Monitoring Report Form	



**Cooperative Umbrella Instrument**  
**(Entity Structure Name)**

**General**

This *Cooperative Umbrella Instrument* (hereinafter, *Umbrella*) regarding the establishment, use, operation, and maintenance of the **Entity Structure Name** (hereinafter.....) is made and entered into by and among **Entity Structure Name**; and the U.S. Natural Resources Conservation Services (NRCS), U.S. Army Corps of Engineers (COE), U.S. Environmental Protection Agency (EPA), the U.S. Fish and Wildlife Service (FWS), and Iowa Department of Natural Resources (IDNR), (hereinafter, Mitigation Bank Review Team (MBRT)).

The **Entity Structure Name** is an Iowa non-profit corporation, established for the purpose of conducting wetland mitigation activities, and is controlled and funded by the Resource Conservation and Development. .

The establishment, use, operation and maintenance of the Wetlands Mitigation is carried out in accordance with the following authorities:

A. Federal:

1. Clean Water Act, Section 404[33 USC 1344].
2. Council on Environmental Quality Implementing Regulations [40 CFR Part 1508.20].
3. Environmental Protection Agency, Section 404(b)(1) Guidelines [40 CFR Part 230]. Guidelines for specification of Disposal Sites for Dredged or Fill Material.
4. Memorandum of Agreement between the Environmental Protection Agency and the Department of the Army Concerning the Determination of Mitigation under the Clean Water Act Section 404 (b)(1) Guidelines [February 6, 1990].
5. Title XII Food Security Act of 1985 as amended by the Food, Agriculture, Conservation and Trade Act of 1990 [16 USC 3801 *et seq.*].
6. National Environmental Policy Act [42 USC 4321 *et seq.*], including the Council of Environmental Quality's implementing regulations [40 CFR Parts 1500-1508].
7. Fish and Wildlife Coordination Act [16 USC 661 *et seq.*].
8. Fish and Wildlife Service Mitigation Policy [46 FR pages 7644-7663, 1981].
9. Magnuson Fishery Conservation and Management Act [16 USC 1801, *et seq.*].
10. Iowa Wetland Protection Act.
11. The Intermodal Surface Transportation Efficiency Act of 1991.
12. Federal Agriculture Improvement and Reform Act of 1996 (FAIRA), Public Law 104-494. 16 USC 3801 *et seq.*
13. Federal Guidance for the Establishment, Use, and Operation of Mitigation Banks, effective December 28, 1995.
14. National Historic Preservation Act (NHPA).

B. Disclaimer: This *Umbrella* does not in any manner affect statutory authorities and responsibilities of the signatory parties.

Access and Inspection: Access to the sites by all signatory parties for the purpose of inspection and compliance monitoring consistent with the terms and conditions of this

*Umbrella Instrument* is available at any time.

The **Entity Structure Name**, or its designee agrees to perform all necessary work, in accordance with the provisions of this *Umbrella*, to establish and/or maintain approximately the wetland habitat, and buffer, until it is demonstrated to the satisfaction of the appropriate regulatory authorities that the project complies with all conditions contained herein, or until all credits are sold, whichever is later.

The **Entity Structure Name**, will obtain all appropriate environmental documentation, permits or other authorizations needed to establish and maintain the wetlands mitigation sites. This *Umbrella* does not fulfill or substitute for such authorization.

## **I. Purpose**

The purpose of this *Umbrella* is to provide guidelines and responsibilities for the establishment, use, operation, and maintenance of the wetland mitigation sites, wherein funds will be paid to a natural resource management entity (**Entity Structure Name**) for implementation of either specific or general wetland or other aquatic resource development project. The wetland mitigation sites will be used for compensatory mitigation for impacts to wetlands which result from agricultural activities authorized under Swampbuster Provisions of the 1985 Food Security Act, as amended, and activities authorized under Section 404 of the Clean Water Act and provided such use has met all applicable requirements and is authorized by the appropriate authority.

The programs or activities conducted under this agreement shall be in compliance with the nondiscrimination provisions contained in Title VI and VII of the Civil Rights Act of 1964, as amended; the Civil Rights Restoration Act of 1987 (Public Law 100-259); and other nondiscrimination statutes: namely Section 504 of the Rehabilitation Act of 1973, Title IX of the Education Amendments of 1972, the Age Discrimination Act of 1975, and American with Disabilities Act of 1990. They shall be in accordance with regulations of the Secretary of Agriculture (7 CFR 15, Subparts A & B), which provide that no person in the United States shall, on the grounds of race, color, national origin, gender, religion, age, disability, political beliefs, marital or family status, or sexual orientation, be excluded from participation in, be denied the benefits of, or otherwise be subjected to discrimination under any program or activity receiving federal financial assistance from the Department of Agriculture or any agency thereof.

## **II. Organizational Structure of the Wetland Mitigation**

The **Entity Structure Name** shall provide a structure to facilitate matching of those organizations requiring wetland mitigation with those parties providing potential sites where specific restoration projects or types of restoration projects are planned. Organizations requiring mitigation could include Iowa Department of Transportation, *list counties and cities* ..... agricultural parties in these counties and local developers and others. Parties providing potential sites could include County Conservation Boards and the Iowa Department of Natural Resources and others.

## **III. Geographic Service Area**

Service Area: The wetland mitigations sites are established to provide mitigation to compensate for impacts to wetlands within the service area described below and shown in Exhibit A. Hydrologic Unit Code (HUC) 8 watersheds encompassing the

mitigation sites and adjacent HUC 8

Water-sheds within the Iowa Major Land Resource Area (MLRA) are included in the service area:

Additional RC&D land use areas, to be defined and approved on an RC&D basis, include but are not limited to (define)

#### **IV. Project Implementation**

For projects requiring authorization under Swampbuster Provisions of the Food Security Act of 1985, as amended, (Swampbuster), and under Section 404 of the Clean Water Act (Section 404), as amended, the NRCS and COE, respectively, will determine the eligibility of projects to use the wetland mitigation sites. . Wetlands of various types – wet prairie, sedge meadow, and emergent wetlands will be suitable for compensation.

Site Selection: Local watershed planning efforts, as a general matter, identify wetlands and other aquatic resources that have been degraded and usually have established a prioritization list of restoration needs. The mitigation projects will be planned and developed to address the specific resource needs of a particular watershed. Additionally, the Federal, State and local agencies and **Entity Structure Name** should give careful consideration to the ecological suitability of a site for achieving the goal and objectives of compensatory mitigation. The following site selection process will incorporate the following to meet the goals and objectives: size and proximity of other ecological features, source and adequacy of water (may include hydrology model or water budget), compatibility with adjacent land uses and existing watershed plans, concern for the protection of cultural resources and habitat for Federal or State-listed threatened and endangered species, anticipated land use changes in the area, water quality and floodplain management goals, potential for chemical contamination, technical feasibility (sites are designed to be self sustaining), bio engineering processes to be used, restoration will be the first option, followed by creation, enhancement and finally preservation or a combination thereof, consideration for inclusion of upland areas necessary to increase the overall ecological functioning of the site.

Once projects are authorized, The **Entity Structure Name**, or its designee, will be the entity responsible for collecting and spending the mitigation site funds. The **Entity Structure Name**, or its designee, will determine the fees based on a reasonable estimate of funds needed for land acquisition, project planning, construction (including contingency costs and performance bonding), planting (including performance bonding), monitoring (including appropriate design, data collection and analysis costs) long term site maintenance and administrative costs. Costs in these watersheds could range from \$10,000 to \$75,000/acre.

#### **V Land Ownership**

The property title will be acquired in fee by the **Entity Structure Name** or its designee, who may be a public agency or quasi-public conservation organization, provided that restrictions are placed on the appropriate deed instruments to insure that the property will be subjected to conservation restrictions in perpetuity.

Or



The land must be publicly owned. Under terms of this agreement, it cannot be sold or transferred nor can an easement be made except to other qualified conservation organizations.

## **VI Accounting Procedures**

The **Entity Structure Name**, or its designee, shall submit a statement to the MBRT annually accounting for the following items: completed projects, funds to date, pending projects, permitted expenditures, total acres of permitted losses, total acres replaced, total feet of permitted losses and total feet replaced.

## **VII. Performance Standards for Success**

Success Criteria: The following criteria will be used by the regulatory agencies in consultation with the MBRT to assess overall project success:

Wetlands for credit shall meet criteria for jurisdictional wetlands using the 1987 Corps of Engineers Wetlands Delineation Manual (Technical Report 4-87-1). In order to be considered fully successful, sites must result in viable wetlands capable of performing important functions with performance standards as outlined below:

Performance standards may be set for any characteristic that influences wetland functions.

Performance standards consisting of measurable success criteria will be established for each site to determine if goals are being met. Criteria must be specific, measurable and attainable.

For Example:

Goal: Create 10 acres of palustrine emergent seasonal wetlands. Avoid *Typha spp* monoculture.

Determine water regimes by direct observations of site conditions and/or monitoring wells, or infer from indicator status of dominant species.

Determine emergent wetland plant acreage from on site data or from scaled aerial photography. Open water areas greater than 0.2 acres in size will not be included.

After three complete growing seasons canopy coverage of *Typha spp* will not exceed 30%.

For example:

Goal: Native species will dominate created mitigation sites

Species dominance is defined as 50% occurrence in one (1) square meter frequency plots placed at 6 meter intervals along permanent transect lines. After three complete growing seasons at least 75% of the species meeting this definition of dominance will be native species.

## VIII. Reporting Protocols and Monitoring Plan

The **Entity Structure Name**, or its designee, will use established procedures for monitoring wetland mitigation sites to meet COE requirements (attached to Umbrella). Sites will initially be monitored on at least an annual basis. Each mitigation site will have an individual site plan which will include: goal and objectives for site, map, location, ownership and/or easement, area (size), type of wetlands, other aquatic characteristics (salinity, alkalinity, etc), baseline conditions, development/establishment plan, types of impacts suitable for compensation, reporting and monitoring protocols, contingency and remediation actions and responsibilities, compensation rations, provisions for long term monitoring and maintenance, methods for determining credits, performance standards for determining credit availability and bank success, accounting procedures.

## IX. Contingency and Remedial Actions and Responsibilities

In the event the Mitigation Site fails to achieve the success criteria specified in Part VIII of this *Umbrella*, the **Entity Structure Name**, or its designee shall develop necessary contingency plans and implement appropriate remedial actions for the Mitigation Site in coordination with regulatory agencies.. In the event **Entity Structure Name**, or its designee fails to implement necessary remedial actions within 120 calendar days after notification by the regulatory agencies of necessary remedial action to address any failure in meeting the success criteria, regulatory agencies will notify **Entity Structure Name** and its designee, and recommend appropriate remedial actions.

As determined by the regulatory authorities in coordination with the **Entity Structure Name**, if conditions at the wetland mitigation site do not improve or continue to deteriorate within a reasonable time frame from the date that the need for remediation was first identified in writing to the **Entity Structure Name** by the regulatory authorities, the performance bond shall be utilized by the **Entity Structure Name** to secure a qualified contractor to undertake corrective measures.

At the request of the **Entity Structure Name**, the appropriate regulatory authorities will make a final site visit to verify whether all success criteria have been satisfied. Upon satisfaction of the success criteria and no further monitoring, the financial guarantee will be released to the site owner.

## X. Financial Assurances

Specific financial assurances are not required in umbrella or site plans because they are going on good-faith since the **Entity Structure Name** and the participants are federal, state and county agencies. It is assumed that a public agency will not default on obligations.

The **Entity Structure Name** will hold any mitigation construction and monitoring fees collected pursuant to these Umbrella mitigation procedures in an interest-bearing escrow account, in an investment instrument, or banking institution so as to gain interest while maximizing the safety and preservation of the principal amount of funds in the account. These accounts will be maintained until the funds have been expended or monitoring is complete. Interests earned through investments and assets left over from mitigation projects will remain with **Entity Structure Name** for

future mitigation projects and administrative costs in accordance with mitigation procedures.

## **XI. Provisions for Long-Term Management and Maintenance**

Long Term Management: Wetland mitigation sites will protected in perpetuity with appropriate legal arrangements (eg conservation easements, transfer of title to public agency, or non profit conservation organization). These arrangements will seek to restrict harmful activities that might otherwise jeopardize the purpose of the mitigation site. Each site plan will identify the entity responsible for long term site management.

A copy of as-built drawings and specifications will be provided to the regulatory agencies within 60 days of completion of grading/construction activities for each wetland mitigation site.

Maintenance Provisions: **Entity Structure Name** or its designee, agrees to perform all necessary work to maintain the wetland mitigation sites consistent with the maintenance criteria established in the Wetland Restoration and Management Plans for each site. **Entity Structure Name** shall continue with such maintenance activities until closure of the wetland mitigation Site. Upon closure of the wetland mitigation Site, the Sponsor shall implement the management requirements established in Part VIII. Deviation from the approved Wetland Restoration and Management Plans is subject to review and written approval by appropriate regulatory agencies.

Monitoring Provisions: **Entity Structure Name**, or its designee, agrees to perform all necessary work to monitor the Mitigation sites, to demonstrate compliance with the success criteria established in this *Umbrella*.. Work will include compliance monitoring that will be performed on an annual basis for a minimum of five years and all success criteria (see Section VII.) have been met.

Monitoring shall occur for a minimum of five years from the date of the completion of the approved planting plan. Management shall proceed on a continuing basis from the completion of planting through the end of the monitoring period or until the mitigation site meets the goals. Any required remedial measures will be based on information contained in monitoring reports or agency site inspections and shall be the financial responsibility of the **Entity Structure Name**, or its designee.

The monitoring results for the mitigation sites shall be provided to the MBRT, on an annual basis during the monitoring period. Following this, no report shall be required, but the regulatory agencies shall retain the right to inspect the mitigation site as deemed appropriate. Joint field inspections of the mitigation sites shall be conducted by the MBRT, as needed.

The **Entity Structure Name**, or its designee shall be responsible for monitoring and reporting regarding the mitigation bank site. This work may be accomplished by **Entity Structure Name** personnel or other qualified persons under the direction of the **Entity Structure Name**.. A copy of an example monitoring reporting form is included.

The operational life of the mitigation site shall consist of the period during which the terms and conditions of the *Umbrella* are in effect. With the exception of arrangements for the long-term management and protection in perpetuity of the wetlands and/or other aquatic and upland resources included in the wetlands mitigation site, the operational life of a mitigation site and monitoring requirements terminate at the point when:

1. Appropriate regulatory agencies have determined mitigation sites are fully functional or self-sustaining to the degree specified in the *Umbrella* and associated documents, or;
2. **Entity Structure Name** has submitted a written notice to voluntarily terminate the wetland mitigation site activity and regulatory agencies have determined that the wetland mitigation sites are functionally mature or self-sustaining to the degree specified in the *Umbrella* and associated documents.

A final report shall be submitted to MBRT upon termination of **Entity Structure Name** and completion of the provisions for long-term management and maintenance. In addition to those items identified in the as-built report (X, B), the report shall include any changes in long-term management and a finalized ledger.

C. At the end of the active monitoring period, the public agencies that own the properties shall be responsible to manage the Mitigations sites in perpetuity in accordance with the terms of the long-term management plans and Interagency Agreement provisions.

## **XII. Responsibilities of the MBRT**

A. The agencies represented on the MBRT agree to provide appropriate oversight in carrying out provisions of this *Umbrella*.

B. The agencies represented on the MBRT agree to review and provide comments, as needed, on all project plans, monitoring reports, credit reports, contingency plans, and necessary approvals for the **Entity Structure Name** in a timely manner. Any comments on the reports shall be submitted to **Entity Structure Name** within 30 calendar days from the date of complete submittal, except for good cause.

C. The MBRT shall conduct compliance inspections, as necessary, in consultation with the **Entity Structure Name**, to verify certified credits available in the mitigation sites, recommend corrective measures (if any), until the terms and conditions of the *Umbrella* have been determined to be fully satisfied.

## **XIII. Other Provisions**

A. Force Majeure: **Entity Structure Name** will not be responsible for wetland mitigation site failure that is attributed to natural catastrophes such as flood, drought, disease, regional pest infestation, etc., that MBRT determines is beyond the control of **Entity Structure Name** to prevent or mitigate.

B. Dispute Resolution: Resolution of disputes about application of this *Umbrella* shall be in accordance with those stated in the Federal Guidance for the Establishment, Use and Operation of Mitigation Banks (60 F.R. 58605 *et seq.*, November 28, 1995).

C. Validity, Modification, and Termination of the *Umbrella Instrument*: This *Umbrella Instrument* will become valid on the date of the all parties signatory's signature. This *Umbrella Instrument* may be amended, modified, or terminated with the written approval of all signatory parties.

D. Specific Language of *Umbrella* Shall Be Controlling: To the extent that specific language in this document changes, modifies, or deletes terms and conditions contained in those documents that are incorporated into the *Umbrella* by reference, and that are not legally binding, the specific language within the *Umbrella* shall be controlling.

E. Document Updating and Revision: It will be necessary to update this *Umbrella* as new laws, regulations and guidance pertaining to mitigation under Section 404 requirements are promulgated. Ideas for improving this document will become apparent over time as it is used. Changes to the *Umbrella* will be provided to the MBRT.