

WETLAND MITIGATION BANKING IN NORTH DAKOTA

Interagency Guidance for Mitigation Bank Sponsors



Helping People Help the Land



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The cover image depicting a semipermanent wetland in Wells County, North Dakota was taken by Craig Bihrlle, North Dakota Game and Fish Department.

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I. INTRODUCTION

A wetland mitigation bank is a wetland or a group of wetlands that have been restored, created, or enhanced to provide compensation for unavoidable impacts to wetland resources. A mitigation bank may be created by a government agency, corporation, nonprofit organization, or individual. The bank has an established number of mitigation credits available to offset or compensate for unavoidable wetland losses.

Wetland mitigation banks are developed to facilitate the efficient planning of construction projects while ensuring wetland impacts are adequately addressed. Through a coordinated partnership, mitigation banking provides state and county highway departments, county water resource boards, other agencies, developers, and landowners with reliable procedures to plan and develop future projects. Wetland mitigation banking is particularly beneficial for agencies and organizations developing projects that commonly result in wetland losses, such as highway projects, airport improvements, and agricultural activities. Mitigation banking is an efficient and effective method to meet wetland mitigation requirements by investing time to establish a bank of mitigation credits in advance of project impacts. For agencies and organizations with construction programs that frequently impact wetlands, mitigation banking has proven to be a more reliable, cost-effective means of compensating for unavoidable wetland losses than locating and developing an individual mitigation site for each construction activity or project.

Advantages of establishing a wetland mitigation bank include:

- provides practical options for lessening the cost and regulatory burden of replacing wetlands when mitigation is required.
- reduces project planning and the regulatory processing time.
- brings together the needed expertise to ensure the success of the mitigation sites.
- uses the best available science to develop wetland mitigation plans.
- restores degraded wetland complexes in an ecologically sound manner.

To date, wetland mitigation banks in North Dakota have been primarily established to mitigate for unavoidable impacts associated with highway improvement projects. Representatives from the following agencies currently serve on the North Dakota Interagency Review Team (NDIRT): North Dakota Game and Fish Department (NDGFD); Federal Highway Administration (FHWA); Natural Resources Conservation Service (NRCS); U.S. Army Corps of Engineers (Corps); U.S. Environmental Protection Agency (EPA); and U.S. Fish and Wildlife Service (FWS). Appendix A provides contact information for the agencies that are currently serving on the NDIRT.

The term “mitigation” is used throughout this document. For the purposes of this document, mitigation refers to compensatory measures that can be implemented to replace unavoidable impacts to wetland resources. The process of evaluating a project proposal affecting wetlands and developing a mitigation plan includes evaluating practical ways to avoid and minimize project losses, thus reducing or eliminating the need for compensatory mitigation. Opportunities to avoid and minimize wetland impacts will be fully evaluated before considering the use of credits in an established mitigation bank. Appendix B provides a glossary of mitigation banking and wetland terms used in this guidance document.

There are three mechanisms for compensatory mitigation: 1) permittee/landowner responsible mitigation, 2) mitigation banks, and 3) in-lieu fee mitigation programs. Permittee/ landowner responsible mitigation is the most traditional form of compensation and, as the name implies, the permittee/landowner retains responsibility for the successful completion of the required mitigation measures. Mitigation banks are generally planned and operated by a construction agency, such as the North Dakota Department of Transportation (NDDOT), or a private entity that plans to sell mitigation credits. In-lieu fee mitigation programs are generally administered by either state or local governments or non-profit, non-governmental organizations. In lieu-fee programs rely on fees collected from permittees or landowners to initiate compensatory mitigation projects. Both mitigation banks and in-lieu fee programs replace unavoidable wetland losses offsite.

II. PURPOSE AND SCOPE

This document provides specific procedures, guidance, and recommendations for establishing, operating, and maintaining wetland mitigation banks in North Dakota. The goal of this document is to provide a consistent, clear set of procedures to assist federal, tribal, state, and county agencies, agricultural producers, developers, and individuals to mitigate unavoidable wetland losses. This document has been developed to comply with the goals and objectives of Section 404 of the Clean Water Act, the National Food Security Act of 1985, as amended, and Executive Order 11990 concerning the protection of wetland resources. The procedures described in this document may not be applicable to fens and riverine systems. If a mitigation bank is proposed to offset impacts to fens and riverine systems, the proposed bank location and the methods for developing mitigation credit will be evaluate on a case by case basis.

The NDIRT relied extensively on the U.S. Army Corps of Engineers and the Environmental Protection Agency's Compensatory Mitigation Final Rule, entitled *Compensatory Mitigation for Losses of Aquatic Resources* (Federal Register Vol. 73, No. 70, April 10, 2008). The NDIRT also used information provided in the U.S. Army Corps of Engineers – Omaha District's guidance document on mitigation and mitigation banking to prepare this document, specifically addressing North Dakota's unique wetland resources and opportunities for mitigating unavoidable wetland impacts in an ecologically sound manner.

As a result of the differing authorities and responsibilities of each agency represented on the NDIRT, there is a need for the participating agencies to develop a clear, consistent set of procedures for mitigation banks in North Dakota. This guidance document, based on the consensus of the participating agencies, has been written to assist agencies, organizations, and the general public in making sound decisions concerning mitigation banking. This guidance document is based on the best available scientific information concerning the ecology of prairie wetlands and wetland mitigation methods that have proven effective in North Dakota. Regulatory responsibilities, agency staffing, and budgetary factors were considered in developing practical guidance procedures that can be implemented.

Up to now, no in-lieu fee mitigation programs have been proposed in North Dakota; therefore, this document does not specifically address in-lieu fee mitigation. If in-lieu fee mitigation is proposed, the NDIRT will use the Compensatory Mitigation Final Rule, North Dakota Mitigation Banking Guidance Document, and other relevant resources to develop additional guidance for in-lieu fee mitigation programs in North Dakota.

III. POLICY CONSIDERATIONS

The NDIRT intends to apply the procedures described in this document to all new mitigation banks developed after July 9, 2008. All previously approved individual mitigation sites and wetland mitigation banks will remain in effect and will not be altered as a result of this document. However, if an existing wetland mitigation bank instrument is modified after July 9, 2008, including the purpose of the bank, authorization of sites under an umbrella agreement, expansion of an existing site, or the addition of a different type of resource credit (e.g. stream credits to a wetland bank) it must be consistent with the provisions of the Compensatory Mitigation Final Rule.

The NDIRT developed a document focusing on specific wetland mitigation measures that have been proven successful in North Dakota. We have worked to simplify the myriad of federal mitigation regulations and policies to create a transparent process that can be implemented throughout the state. However, this document addresses only one aspect of developing a complete project proposal that is in compliance with state and federal regulations. The Corps, the NRCS, and the North Dakota State Water Commission (NDSWC) have the responsibility to consider each project on its own merits and to work with the applicant or agricultural producer to jointly develop an environmentally sound alternative, when a practical alternative exists that will reduce impacts to aquatic

ecosystems. The Corps, NRCS, and NDSWC are required by law to consider numerous factors prior to authorizing project construction. Developing an ecologically sound compensatory mitigation plan is only one element in the project review and approval process. A mitigation plan developed in accordance with this guidance document does not assure a project will be granted final approval by the federal and/or state permitting agencies.

IV. APPLICABLE ENVIRONMENTAL REGULATIONS AND POLICIES

Projects impacting wetland resources must be in compliance with existing federal, tribal, and state statutes and regulations and consistent with applicable policies, including:

- Clean Water Act {33 U.S.C.1251 et seq.}, Section 404 and Section 401.
- Food Security Act of 1985, as amended (7 CFR Part 12).
- Compensatory Mitigation for Losses of Aquatic Resources – Final Rule (Federal Register Vol. 73, No. 70, April 10, 2008)
- National Environmental Policy Act {42 U.S.C. 4321 et seq.} and implementing regulations.
- Fish and Wildlife Coordination Act {16 U.S.C. 661-666 (c)}.
- U.S. Fish and Wildlife Service Mitigation Policy.
- Rivers and Harbors Act of 1899 {33 U.S.C. 403}.
- Section 404(b)(1) Guidelines {40 CFR, Part 230}; including interpretations of the Guidelines in the Memorandum of Agreement between EPA and the Department of the Army Concerning the Determination of Mitigation under the Clean Water Act Section 404(b)(1) Guidelines.
- Federal Permit Regulations {33 CFR, Part 320-330} including interpretive guidance provided by the Corps.
- Endangered Species Act, as amended {16 U.S.C. 1531-1543}.
- Federal Guidance on the Use of the TEA-21 Preference for Mitigation Banking to fulfill mitigation requirements under Section 404 of the Clean Water Act.
- Executive Order 11990, concerning the Protection of Wetlands.
- Executive Order 11988, concerning Floodplain Management.
- 1990 Memorandum of Agreement between the Department of the Army and the Environmental Protection Agency on the Determination of Mitigation under the Clean Water Act 404(b)(1) Guidelines.
- FAA Advisory Circular 150/5200-33, Hazardous Wildlife Attractants On or Near Airports.

This guidance does not alter or modify requirements of any state or federal law, executive order, or regulation, nor is it regulation itself. The NDIRT member agencies will use the guidance in concert with the April 10, 2008 Compensatory Mitigation Rule that was jointly issued by the Corps and EPA. The statutory provisions and regulations referenced in this document contain legally binding requirements. This guidance does not impose legally binding requirements on the NDIRT member agencies or any other party, and may not apply in all circumstances. The NDIRT member agencies retain the discretion to adopt approaches on a case-by-case basis that differ from this guidance, when appropriate.

Such decisions will be based on the facts of a particular case and the applicable legal requirements. Therefore, interested parties are encouraged to raise questions and discuss the provisions of this guidance document and the appropriateness of its application to their particular situation.

The NDIRT will review this guidance document, upon the request of the participating agencies or other interested parties, when a specific issue is identified. Periodic reviews will consider all new wetland regulations, policies and procedures, new information pertaining to the art and science of wetland mitigation and monitoring, and other relevant information. At a minimum, this guidance document will be reviewed each year to ensure technical accuracy and applicability throughout North Dakota. The intent of the NDIRT is to establish an open, transparent process for examining all aspects of wetland mitigation bank proposals.

This guidance document was made available for public review and comment through the Corps' Public Notice Review Process during May 2009. The Federal Aviation Administration (FAA) submitted comments concerning the potential of creating hazardous situations if a wetland mitigation bank is located near a public use airport. To address this issue, the NDIRT will not consider a proposed wetland mitigation bank located within two miles of a public use airport. For wetland mitigation banks proposed within two to five miles of a public use airport, the NDIRT will consult with the airport authority, FAA, and U.S. Department of Agriculture – Wildlife Services to evaluate the proposed bank and environmental factors contributing to aircraft-wildlife strikes.

V. GOALS AND PRINCIPLES

The NDIRT used the Corps - Omaha District's guidance on mitigation and mitigation banking to prepare procedures tailored to North Dakota and the unique challenges of mitigating impacts to northern prairie wetlands. The NDIRT fully supports following the Corps' Environmental Operating Principles and the principles established by the President's Council on Environmental Quality (CEQ). We believe these principles should be used to guide the planning, design, and construction of projects requiring mitigation. Additional information concerning the seven principles listed below can be found at www.hq.usace.army.mil/cepa/envprinciples.htm.

1. Strive to achieve environmental sustainability. An environment maintained in a healthy, diverse and sustainable condition is necessary to support life.
2. Recognize the interdependence of life and the physical environment.
3. Seek development activities and natural systems by designing economic and environmental solutions that support and reinforce one another.
4. Seek solutions that promote human health and welfare and the continued viability of natural systems.
5. Seek ways and means to assess and mitigate cumulative impacts to the environment; bring systems approaches to the full cycle of our processes and work.

6. Build and share an integrated scientific, economic, and social knowledge base that supports a greater understanding of the environment and impacts of our work.
7. Respect the views of individuals and groups interested in Corps activities, listen to them actively, and learn from their perspective in the search to find innovative win-win solutions to the nation's problems that also protect and enhance the environment.

VI. NORTH DAKOTA'S WETLAND RESOURCES

At the time North Dakota was admitted to the Union in 1889, there were approximately five million acres of prairie wetlands dotting the landscape, with the vast majority of these basins located north and east of the Missouri River. Today, approximately half of the wetlands present at the time of statehood remain. Wetland densities of 30-40 basins per square mile are common throughout a large portion of the prairie pothole region of North Dakota. In Mountrail County, the countywide average exceeds 85 wetlands per square mile; and, in specific areas of the state, wetland density approaches 200 separate basins per square mile.

Prairie wetlands depend on runoff from the surrounding landscape and/or groundwater sources to maintain hydrologic characteristics, including depth and duration of ponding and saturation. Wetlands provide a number of functions including water storage, water filtration, plant resilience, and carbon sequestration. North Dakota's prairie pothole wetlands are internationally recognized for their value in providing essential habitat for migratory birds, especially breeding waterfowl and shorebirds. The dynamic nature of North Dakota wetland resources, going through frequent wet/dry cycles, is a major factor contributing to the high productivity of this ecosystem.

VII. AN OVERVIEW OF MITIGATION BANKING IN NORTH DAKOTA

The agencies comprising the NDIRT have gained considerable experience assessing prairie wetland impacts and developing individual wetland mitigation sites and banks. Most of the wetland mitigation banks in North Dakota have been constructed by the North Dakota Department of Transportation (NDDOT), in cooperation with the FHWA and the NDIRT, to address impacts associated with highway improvement projects. The NDIRT and its member agencies have also provided guidance on mitigation banks to other federal, state, and county agencies. To date, there has been limited interest by entrepreneurs to develop wetland mitigation banks and sell mitigation credits in North Dakota.

Based on the NDIRT's collective experiences, the NDIRT supports developing wetland mitigation banks as an efficient, effective means of offsetting unavoidable impacts. The practice of restoring degraded wetland complexes by filling drainage ditches or disrupting underground drainage pipes or tile drains, removing accumulated sediment, and implementing a revegetation plan, have yielded high quality wetland mitigation banks at a number of locations in North Dakota. Mitigation banking provides greater certainty to

construction agencies and project proponents by providing a reliable source of mitigation credits. Establishing mitigation credits in advance of project construction saves time and money, as compared to locating and developing an individual mitigation site for each project.

The NDIRT emphasizes finding large, high quality, restorable wetland complexes as an efficient way to proceed with project planning and construction. Mitigation banks that restore diverse wetland complexes best accomplish the goal of replacing wetland losses with wetlands that provide similar functions. The NDIRT believes developing larger mitigation banks, with a diverse assemblage of wetlands, is ecologically and logistically preferable to developing and monitoring numerous small sites scattered throughout North Dakota. Establishing a mitigation bank featuring wetlands with different sizes, shapes, and water regimes and diverse plant and invertebrate communities does a better job of meeting the habitat requirements of resident wildlife and migratory birds than restoring an individual wetland basin. Restoring a diverse complex of wetlands also minimizes the consolidation of impacts from numerous individual wetlands into one large basin.

VIII. CREATING A WETLAND MITIGATION BANK

In North Dakota, the most reliable way to compensate for wetland impacts is to restore drained wetlands by plugging surface ditches or disrupting drainage tile, removing sediment, and implementing a revegetation plan. Drained wetlands have hydric soils and, in most instances, an adequate watershed to support the basin. These factors are critically important to help ensure the long-term success of a wetland mitigation bank. Restoring drained wetland habitat eliminates uncertainties associated with creating wetlands by excavating in uplands or damming non-wetland drainageways to pond water. The NDIRT supports the restoration of drained wetlands as the first option for mitigating unavoidable impacts to wetland resources. This approach is consistent with the guidance provided in the Compensatory Mitigation Final Rule.

Each potential wetland mitigation bank is unique. A number of factors must be evaluated to assess the viability of creating a mitigation bank and determining mitigation credits. This assessment includes a field review with the bank sponsor and the NDIRT to evaluate the surrounding watershed and the tract offered for mitigation. The field review and site selection process are critical steps in establishing a successful wetland mitigation bank. Factors considered by the NDIRT include the surrounding landscape, density of restorable wetlands, landowner interest, ability to fully restore wetlands without affecting neighboring landowners, geographic location of the mitigation bank, and financial assurances provided by the bank sponsor.

There are a number of important considerations in creating a successful wetland mitigation bank. The following list provides examples of common issues that need to be evaluated. This list is not intended to be all inclusive.

1. The mitigation bank must possess the physical, chemical, and biological characteristics to establish or reestablish wetland functions.

2. An adequate source of water to support the mitigation bank must be available (i.e. sufficient ground water, surface flows, snowmelt, or rainfall) to develop wetland vegetation and wetland soil characteristics.
3. A mitigation bank must develop adequate wetland characteristics to compensate for wetlands that will be lost or adversely affected by construction. For example, if a shallow wetland that holds water for a portion of the growing season is filled to complete a highway improvement project, it should generally be replaced with a wetland providing similar characteristics.
4. Adequate long-term protection measures, such as an easement, must be in place to ensure the wetland functions provided by the mitigation bank are not impacted by future alterations or encroachment.
5. The presence of unique plant communities, cultural sites, and/or threatened and endangered species habitat are factors that will be evaluated during the mitigation bank review process. No ecologically or culturally significant sites will be adversely affected by the construction or management of a mitigation bank.
6. A 50-foot grassland buffer strip around the perimeter of each wetland basin will be established and maintained to minimize the accumulation of sediments and nutrients in wetlands designated for mitigation, if practical.
7. Ideally, wetland mitigation banks will provide an opportunity to restore a diverse complex of wetlands, including wetlands with temporary, seasonal, and semipermanent water regimes. Mitigation banks featuring a complex of drained wetlands replace losses in-kind and minimize the consolidation of impacts from many individual wetlands into one large wetland basin.
8. Mitigation banks should not rely on complex structures, pumping, or other methods requiring ongoing maintenance. The experience of the NDIRT indicates with the passage of time funding for required operation and maintenance activities will likely be jeopardized or eliminated and the wetland functions provided by these banks will degrade. Mitigation banks should be designed to establish wetland conditions that are self-sustaining.

IX. MITIGATION BANKING GUIDELINES AND PROCEDURES

A. Role of the Interagency Review Team: The primary role of the NDIRT is to facilitate the establishment of mitigation banks by ensuring reliable information is available to assist bank sponsors make informed decisions. The NDIRT will provide guidance to interested agencies, organizations, and individuals, to plan and develop wetland mitigation banks. Up-front planning provides an opportunity to address outstanding issues and answer questions. Early coordination provides bank sponsors agency with contacts to assist with planning a mitigation bank and ensuring its success.

B. Role of the Bank Sponsor: The bank sponsor may be an agency, organization, or individual that owns or has control of the mitigation bank. The bank sponsor is responsible for the overall operation, management, monitoring, and success of the bank in accordance with the terms of the banking agreements. The sponsor either purchases the land or works with a landowner(s) to restore and protect a parcel of land containing a high density of degraded wetlands.

The bank sponsor usually prepares two agreements as part of the process for creating a mitigation bank: the mitigation bank prospectus and mitigation bank instrument. The prospectus provides a brief overview of the mitigation bank, identifying its purpose, and providing a description of the location and land use patterns/habitats present at the proposed mitigation bank. The primary purpose of the prospectus is to assess the feasibility of a proposed mitigation bank and determine if preparing a more detailed mitigation bank instrument is warranted. A key element of the prospectus is a detailed map of the mitigation bank identifying both the existing and degraded wetlands and drainage patterns. Appendix C describes the information that is required to be provided in a complete mitigation bank prospectus.

The mitigation bank instrument is a more-detailed, formal document prepared by the mitigation bank sponsor in coordination with the NDIRT. This document contains all the site-specific information necessary to develop, monitor, and maintain a mitigation bank. The mitigation bank instrument also establishes criteria for evaluating the success of a mitigation bank. The bank sponsor typically prepares a draft mitigation bank instrument that is reviewed by the permitting agencies and the NDIRT. The sponsor is required to obtain the necessary permits and provide assurances that the mitigation bank will be maintained in accordance with long-term management objectives. As part of the mitigation bank instrument, the sponsor, in consultation with the NDIRT, is responsible for developing a credit release schedule and maintaining a mitigation ledger to track the use of mitigation credits. Appendix D provides a brief description of the 12 fundamental components of a mitigation bank instrument or mitigation plan.

C. Implementation Procedures: Given the complexities associated with each potential mitigation bank, bank sponsors are encouraged to meet with the NDIRT early in the planning process to ensure important decisions are based on reliable information. Early coordination identifies tasks and responsibilities for completing a mitigation bank and establishes contacts to assist in moving a mitigation bank towards completion. This process provides an opportunity to ask questions, discuss issues, and develop a productive way to proceed. In addition, early notification minimizes the risks associated with developing a bank and helps ensure project funds are used in an efficient, effective manner. Up-front planning also helps eliminate unsuitable wetland mitigation bank locations before significant resources are expended.

The NDIRT will provide guidance to bank sponsors, evaluate potential mitigation banks, and review the mitigation bank prospectus and instrument. The NDIRT also works with the bank sponsor to determine mitigation credits, identify monitoring and success criteria, and establish a schedule for the development and use of the credits. If credits in a wetland

mitigation bank will be used for projects requiring authorization under Section 404 of the Clean Water Act, the Corps' District Commander in Omaha, Nebraska, must review and approve a bank before it can be activated. The NDIRT is responsible for approving and activating mitigation banks designed to offset impacts to non-jurisdictional wetlands.

D. Operational Life of a Wetland Mitigation Bank: The operational life of a wetland mitigation bank refers to the period of time when the terms and conditions of the banking instrument are in effect. A wetland mitigation bank remains operational as long as credits are available for use or until the bank is voluntarily terminated by the bank sponsor. Once all credits in a bank have been used, only the long-term agreement assuring the protection of mitigation wetlands will remain in place. In rare instances, a mitigation bank may be terminated; however, it cannot be terminated until the bank sponsor replaces all used mitigation credits at a location approved by the NDIRT.

E. Protection / Long-Term Management: The mitigation bank instrument should clearly define long-term management objectives for the mitigation bank. Bank sponsors shall ensure the mitigation bank is adequately protected by acquisition, easement, or deed restriction, as deemed necessary by the lead agency. Acquisition of the mitigation bank by the bank sponsor and management by a public land management agency is also a viable option, provided an acceptable management agreement can be developed.

F. Geographic Applicability: The NDIRT used the information provided in the 2008 Compensatory Mitigation Rule to assist in establishing appropriate Regional Service Areas (RSA) for wetland mitigation banks in North Dakota. An RSA is the geographic area of the state where banked credits can be used to compensate for project losses.

The majority of North Dakota's wetland resources are isolated prairie pothole wetlands located north and east of the Missouri River. With that in mind, the NDIRT evaluated numerous scenarios defining appropriate service areas for wetland mitigation banks in North Dakota. Specific information from Bailey's Ecoregions of the United States, the biotic areas of North Dakota as described in *Breeding Birds of North Dakota* (Stewart 1975), U.S. Geological Survey's four-, six- and eight-digit Hydrologic Unit Codes (HUCs) and the North Dakota Department of Health's 303(d) list of Impaired Waters was considered in the process of developing RSAs for North Dakota. The goal of the NDIRT was to develop RSAs that met the following criteria:

1. RSAs are ecologically sound, thus ensuring functions provided by the prairie wetlands impacted by construction will be replaced by ecologically equivalent wetlands at the designated mitigation bank.
2. RSAs are efficient and practical for the bank sponsor and the participating agencies.
3. RSAs provide flexibility allowing bank sponsors to locate and restore high quality drained wetlands complexes.

4. RSAs should be large enough to support an economically viable wetland mitigation bank, while ensuring the bank adequately compensates for adverse impacts throughout the entire service area.

The NDIRT identified six RSAs (Map 1) defining the maximum geographic applicability for wetland mitigation banks in North Dakota. A brief description of each of the RSAs follows.



Map 1. Wetland Mitigation Bank Regional Service Areas For North Dakota

Region 1: Southwest Slope: The Southwest Slope, commonly referred to as West River, includes mixed-grass prairie, with numerous intermittent drainages, permanent streams, and scattered wetlands. This semiarid, unglaciated region of North Dakota includes level to rolling plains topography with badlands topography primarily along the Little Missouri River and isolated sandstone buttes. Land use is predominantly dryland farming of spring and winter wheat, barley, sunflowers, corn and alfalfa interspersed with cattle grazing. Southwestern North Dakota supports substantial undisturbed blocks of native vegetation, including shrub steppe or prairie with a large component of sagebrush in the southwest portion of this area. The density of depressional wetland basins in this portion of North Dakota is low when compared to the other regions of the state. Slope wetlands, or wetlands where there is a discharge of groundwater from steep hillsides to gentle slopes, are relatively common West River.

Region 2: Missouri River Basin – Northern Zone: Regions 2 and 3 include the glaciated land in the Missouri River Basin east and north of the river. The Northern Zone

extends from Divide County in northwestern North Dakota to the drainages contributing to Lake Audubon in central North Dakota. The vast majority of the watersheds in the Northern Zone drain directly to Lake Sakakawea. Land use in this portion of North Dakota is dominated by farming and livestock production. Major crops include small grains, sunflowers, corn, and alfalfa. The landscape component of this region includes rolling mixed-grass prairie and numerous wetlands. This region marks the boundary of the western limits of glaciation in North Dakota. Alkaline lakes, with no surface outlet, are also more prevalent in this portion of the state. Streams, rivers and native woodlands are nearly absent, while a considerable amount of native prairie remains. The wetland and grassland habitat in Regions 2 and 3 are known for supporting some of the highest numbers of breeding ducks in North America.

Region 3: Missouri River Basin – Southern Zone: Region 3 includes portions of central and southeastern North Dakota. The Southern Zone extends from the northwest boundary of the Painted Woods Creek drainage area in central North Dakota south and east, including the James River Basin. The land use patterns, crop production, and wetland resources present in this portion of North Dakota are similar to the description provided for Region 2.

Region 4: Souris River Basin: The Souris River originates in eastern Saskatchewan and forms a 357-mile loop through north central North Dakota before entering Manitoba west of the Turtle Mountains. The topography of this region is varied, including hilly terrain in the southwest, the flat glacial Souris Lake plain in the east, and the forested hills of the Turtle Mountains. Approximately 70 percent of the land base in Region 4 is dedicated to crop production. Portions of the Souris River Basin are characterized by glaciated flat sheets of sand and gravel or rolling sand dunes with numerous wetlands.

Region 5: Devils Lake Basin: The Devils Lake Basin is the result of glacial ice blockage and includes a high concentration of large wetlands and lakes. The Drift Prairie, located in the Devils Lake Basin, is the transition zone between the wetter tallgrass prairie to the east and drier mixed-grass prairie to the west. This region of North Dakota is important for migrating waterfowl and shorebirds. Historic wetland drainage and intense farming is predominant due to the rich soil and relatively flat topography.

Region 6: Red River Basin: The Red River Basin includes the Lake Agassiz Plain and Sheyenne River drainage. The Sheyenne River is the largest contributing tributary to the Red River, which flows north into the Hudson Bay Drainage. This landscape historically consisted of the tallgrass prairie and associated wetlands. Approximately 10,000 years ago, Lake Agassiz, a large glacial lake, covered this region. The flat topography and rich soil of the glacial Lake Agassiz basin provides some of the most productive cropland in North America. Due to the value of this land for agricultural production, only remnant areas of tall-grass prairie remain intact today. Over 80 percent of the land base in the Red River Basin is intensively farmed. Common crops include potatoes, soy beans, sugar beets, corn, and small grains. The eastern portion of the Red River Valley supports few wetlands as compared to the mixed-grass prairie to the west.

X. METHODS FOR MITIGATING WETLAND IMPACTS IN NORTH DAKOTA

Several methods have been used to compensate for wetland impacts in North Dakota including restoration, creation, enhancement, and preservation. A description of each method follows. Additional general information concerning wetland mitigation methods can be found in the Compensatory Mitigation Final Rule and Appendix B of this document.

Restoration: In North Dakota, the vast majority of wetland drainage has occurred by constructing surface drains. While tile drainage or underground network of drainage pipes is present in the state, this method has been not widely used. The restoration of drained prairie pothole wetlands, including the removal of accumulated sediment and implementation of a revegetation plan has proven to be the most reliable method to compensate for impacts to wetland resources. Advantages of restoring degraded wetlands by plugging surface drains or disrupting tile drainage systems include:

1. In most cases, the natural watershed that supplies the basin is intact.
2. Hydric soils exist in the wetland basin.
3. Plugging drainage ditches or disrupting drainage tile is a relatively simple, cost-effective method that generally requires minimal operation and maintenance expenditures.
4. Restoration returns wetlands to their original location on the landscape.

The restoration of wetlands falls into three categories: (1) restoration of completely drained wetlands, (2) restoration of partially drained wetlands, and (3) sediment removal from both existing and drained wetlands. In the first instance, restoration returns the natural and/or historic functions of a former wetland that has been converted to other uses. In most cases, restoring the hydrology of completely drained wetlands, removing sediment, and implementing a revegetation plan will be given acre-for-acre mitigation credit (1:1), i.e. for each acre of drained wetland habitat restored, one acre mitigation credit will be established in the mitigation bank.

In the second instance, wetlands adversely affected by drainage, although not completely drained, are restored. Because a partially-drained wetland basin still provides some wetland functions, determining mitigation credits depends on extent of drainage. In general, full acre-for-acre mitigation credit (1:1) will be given for the portion of the wetland that is completely drained. Half credit will be given for the deeper portion of the wetland that continued to pond water after completion of the drainage project. In other words, restoring two acres of partially drained wetland habitat that still ponds water will yield one acre wetland mitigation credit (2:1).

Most wetland mitigation banks in North Dakota will be located in cropland. Depending on soil type, land use practices, and topography, many wetlands in agricultural fields have accumulated sediment from the surrounding uplands. Over time, sediment gradually fills wetland basins and adversely affects their chemical, physical, and biological functions. Wetlands being considered for mitigation, including existing wetlands, should be assessed to determine the amount of accumulated sediment. Based on this assessment, the wetland restoration plan should include information concerning the amount of sediment in each wetland and whether sediment removal is warranted to restore the wetland.

The removal of sediment from prairie wetlands is an important restoration technique. The accumulation of sediment in existing and drained wetlands varies from negligible amounts that cause no practical adverse impacts to filling the entire wetland and the loss of all wetland functions. As a result, mitigation crediting for sediment removal can vary from no credit to full acre-for-acre replacement (1:1). Sediment removal must be evaluated in the field to determine the depth and extent of the impact area. When warranted, removing sediment from two acres of wetland habitat typically yields one acre of mitigation credit (2:1). Sediment removal is a mitigation technique usually implemented as part of mitigation banks that emphasize restoring the hydrology of drained and degraded wetlands.

Creation: Wetland creation consists of establishing a wetland habitat at a site that was historically non-wetland. Methods used to create wetlands include: excavating uplands to create a depression to pond water; constructing low head dikes or dams across non-wetland drainageways or road ditches; and expanding existing wetland basins by excavating shallow water areas along the perimeter of the basin. Wetland creation is a less reliable method for establishing a fully functioning wetland than wetland restoration. Studies need to be conducted to determine if there is an adequate watershed to support the newly created area and adequate soils to pond water and support wetland vegetation. A plan to establish a wetland vegetation community and monitor its success also needs to be developed. As a result, two acres of created wetlands with a vegetation plan will typically yield one acre of mitigation credit (2:1).

Implementing a compensatory mitigation plan featuring wetland restoration and/or creation requires developing a plan to ensure a diverse community of wetland vegetation becomes established. Mitigation wetlands can be re-vegetated by one or more of the following methods:

1. Establishing a wetland plant community by seeding or installing plugs.
2. Spreading topsoil from donor wetlands.
3. Incorporating “hay” from the adjacent wetland during seed florescence.
4. Allowing natural regeneration if it can be determined an adequate seed bank of wetland plants currently exists in the wetland.

Seeding mixtures recommended by the NDIRT will be designed for individual wetlands in accordance with the wetland’s water regime or duration of ponding and saturation anticipated during the growing season. The following recommendations are examples of

seed mixtures used to restore the plant community of northern prairie wetlands with temporary and seasonal water regimes. The seeding recommendations listed below are on a pure live seed basis.

Temporary zone: 30 percent prairie cordgrass (*Spartina pectinata*), 10 percent fowl bluegrass (*Poa palustris*), 20 percent western sloughgrass (*Beckmannia syzigachne*), 10 percent fox sedge (*Carex vulpinoides*), 10 percent Canada wildrye (*Elymus canadensis*) 15 percent switchgrass (*Panicum virgatum*), 5 percent forbs (swamp verbena (*Verbena hastata*), etc.).

Seasonal Zone: 40 percent whitetop (*Scolochloa festucacea*), 30 percent slough sedge (*Carex atherodes*), 20 percent American mannagrass (*Glyceria grandis*), 10 percent western sloughgrass (*Beckmannia syzigachne*).

The wetland vegetation will be managed (burning, grazing, herbicide application, haying, etc.) to control noxious and invasive plant species as agreed to in the mitigation banking instrument prepared by the bank sponsor.

Enhancement: Enhancement methods are designed to improve the functions of restored and existing wetland basins without increasing their acreage. Enhancement methods used in North Dakota have focused on establishing and managing grasslands adjacent to the mitigation wetlands in accordance with the 2008 Compensatory Mitigation Rule. This federal guidance indicates that mitigation credit may be given for the inclusion of upland areas occurring within a bank only to the degree that such features increase the overall ecological functioning of the bank. The primary enhancement method used in North Dakota is permanently establishing and/or maintaining a 50-foot buffer of upland vegetation around the perimeter of mitigation wetlands. Buffers enhance wetland functions by minimizing the accumulation of pollutants in a wetland, including sediment, pesticides, and nutrients. The buffer also helps to maintain wetland vegetation and invertebrate communities within mitigation wetlands. Establishing five acres of buffer habitat will typically yield one acre of wetland mitigation credit (5:1).

Some landowners have indicated a willingness to establish permanent vegetative cover in the surrounding uplands outside the buffer. This measure allows landowners to square off boundaries of a wetland mitigation bank and develop a logical farm plan for the remainder of their property. Establishing permanent grassland cover enhances the value of the mitigation bank as wildlife habitat. If a landowner is willing to establish and maintain grassland cover, the NDIRT believes a relatively small amount of wetland mitigation credit is warranted. Establishing and maintaining 20 acres of grasslands in the uplands outside the buffer will typically yield one acre of wetland mitigation credit (20:1). Upon the request of the bank sponsor to use uplands for mitigation, the NDIRT will determine the extent of upland habitat needed to increase the ecological function of the mitigation bank. Opportunities to enhance wetland habitat will only be considered as part of mitigation banks emphasizing wetland restoration and/or creation. Mitigation plans that rely primarily on establishing buffers or planting permanent grassland cover will not be considered.

Preservation: Preservation typically involves acquiring land in fee title or purchasing conservation easements to ensure existing wetlands will not be adversely affected in the future. Preservation of existing habitat usually results in the net loss of wetland acreage and functions; therefore, preservation of existing wetlands as a stand alone method of mitigating wetland losses will only be considered in extraordinary circumstances. Preservation of existing wetlands as a minor component of a wetland restoration plan can be included as part of a mitigation plan. Wetland drainage frequently focuses on removing water from the larger basins on a given tract of land. Often several small, shallow wetlands are not drained because of costs associated with connecting every basin to the drainage system. Preserving existing wetlands as part of a wetland restoration plan will be credited at a reduced rate (10:1). It should be noted that the 1985 Food Security Act, as amended, does not authorize the use of preservation credits for mitigation purposes. Only credits established by implementing an approved plan to restore, create, or enhance wetland resources can be used to fulfill the U.S. Department of Agriculture's mitigation requirements.

XI. DETERMINING WETLAND MITIGATION CREDITS

Several methods have been used throughout the United States to evaluate wetland mitigation banks and determine the number of wetland credits. In North Dakota, two distinctly different methods can be used to determine wetland mitigation credits:

1. Scope and Effect Determinations
2. The Hydrogeomorphic (HGM) Wetland Assessment Method

Each of these methods of determining mitigation credits has its own strengths and weaknesses. Scope and Effect Determinations are relatively simple to complete, while HGM procedures provide a stronger scientific basis for determining mitigation credits. The principle drawback to HGM is the commitment of time and resources to collect the necessary field data at both the construction site and the mitigation location in order to run the HGM models. A description of each method follows:

Scope and Effect Determinations: A scope and effect determination is conducted at the request of the bank sponsor to evaluate the effectiveness of a wetland drainage system. To complete this analysis, surveying data is collected at the proposed mitigation bank to document the size, depth, and outlet elevation of all wetlands affected by drainage. Information documenting the amount of sediment accumulated in the mitigation wetlands is typically gathered during the scope and effect field review. The survey data is used to determine if the subject wetlands are completely or partially drained and what, if any, wetland functions remain. After the scope and effect determination is completed in the field, the NDIRT evaluates the data and applies the appropriate credit ratio for each mitigation method the bank sponsor will use.

Wetland credit ratios have been used for several decades in North Dakota and have gained widespread acceptance. The credit ratio for each mitigation method is based on extensive

field experience and the consensus of the team of biologists, engineers, and regulators that contributed to this document. Data available from the application of HGM models in North Dakota have also been used to establish and verify appropriate mitigation credit ratios.

North Dakota’s mitigation credit ratios started from the straight-forward concept of replacing wetland losses with an equal acreage of similar habitat. For example, if a one acre seasonal wetland is filled to complete a needed highway improvement project, this loss will be fully compensated by restoring a drained one acre seasonal wetland. This form of mitigation is commonly referred to as acre-for-acre replacement. However, because mitigation banks often include various wetland mitigation methods, ratios have been developed for each method. Development of ratios for each method begins by crediting the restoration of a completely drained wetland on an acre-for-acre or 1:1 basis. Other mitigation methods are considered in comparison to restoration and are credited in accordance with their ability to compensate for the permanent loss of wetland functions.

Table 1 provides a summary of credit ratios typically given for the mitigation methods used in North Dakota. The ratios are presented for planning purposes to provide bank sponsors guidance to plan and develop successful mitigation banks. Final crediting ratios and actual credits available from an individual mitigation bank will be determined by the NDIRT, in cooperation with the bank sponsor. Site specific information concerning the credits available from a mitigation bank will be formalized and approved as part of the mitigation bank instrument. The NDIRT will review the use of credits from individual mitigation banks to ensure anticipated wetland losses will be replaced in an ecologically sound manner.

The ratios presented in Table 1 are based on the number of acres required for each mitigation method to yield one acre of mitigation credit. For example, establishing five acres of buffer around the perimeter of mitigation wetlands will produce one acre of mitigation credit (5:1).

Table 1. Wetland Mitigation Credit Ratios Typically Given for the Mitigation Methods Used in North Dakota.

| RATIO | MITIGATION METHOD |
|--------------|---|
| 1:1 | Restoration of a completely drained or filled wetlands by plugging the outlet and/or removing accumulated sediment, and implementing a revegetation plan. |
| 1:1 | Restoration of the outer, completely drained portion of a partially drained wetland, removing accumulated sediment, and implementing a wetland revegetation plan. |
| 2:1 | Restoration of the deeper portion of a partially drained wetland |

basin that continued to pond water after completion of the drainage project.

- 2:1 Restoration of an impaired wetland by removing the sediment accumulated in the basin.
- 2:1 Creation of a new wetland by excavation, establishment of ditch blocks, or construction of small dams along non-wetland drainageways.
- 5:1 Enhancement of a wetland basin by establishing and maintaining a 50-foot vegetated, upland buffer around the perimeter of each mitigation wetland.
- 10:1 Preservation of existing wetland habitat as a minor component of a mitigation bank featuring restored and/or created wetlands.
- 20:1 Enhancement of a mitigation tract by establishing permanent grassland cover outside of the 50-foot buffer to square off the boundaries of a mitigation bank and develop a reasonable land use plan for the surrounding property.

Hydrogeomorphic Method (HGM): HGM models have been developed for various types of wetlands in the United States. The Northern Plains Prairie Pothole Hydrogeomorphic Model for depressional wetlands with temporary and seasonal water regimes was developed based on reference sites throughout the prairie pothole region, including North Dakota. HGM models are used to calculate the level of six wetland functions provided by prairie pothole wetlands. The six functions are:

1. Water Storage.
2. Groundwater Recharge.
3. Retention of Particulates.
4. Remove, Convert, and Sequester Dissolved Substances.
5. Plant Community Resilience and Carbon Cycling.
6. Provide Faunal Habitat.

To use the HGM models, field data is collected for 17 variables. Information documenting the variables is collected at both the construction site where wetlands will be impacted and at the HGM bank where specific wetlands are designated to compensate for the anticipated loss. Each of the 17 variables has a measurement or condition that is assessed. The condition is listed on a scaled index from 1.0 to 0.0, with 1.0 representing the least disturbed condition and 0.0 indicating the variable has been completely lost or destroyed. For example, one of the variables assesses the existing vegetative buffer around the perimeter of the wetland. If the wetland is located in a moderately grazed native prairie pasture, the condition of the buffer variable would be rated as 1.0. On the opposite end of the spectrum, if a wetland has been filled and paved over to create a

parking lot, the buffer condition is scored as 0.0.

After data is collected documenting the condition of the 17 variables, the information is imported into the HGM mathematical models to calculate the level of functions provided by the study wetlands. By comparing the wetland functions before and after restoration, mitigation credit for each wetland function is determined.

Use of the HGM techniques requires both training and practice. Additional information on HGM is available from the NDIRT or from the following website maintained by the U.S. Army Corps of Engineers' Waterways Experiment Station in Vicksburg, Mississippi: www.wes.army.mil/el/wetlands/hgmhp.html

Credit Availability: The availability of credits to offset the unavoidable loss of wetland habitat is dependent on the mitigation technique and its track record of success. As described in this document, restoration, enhancement and preservation are mitigation techniques proven successful throughout North Dakota. A portion of the mitigation credits developed by using these techniques may be available for use at three separate milestones during the process of implementing a successful mitigation bank. Up to 20 percent of approved mitigation credit may be available for use when the mitigation bank instrument has been approved, the mitigation bank has been secured, and appropriate financial assurances have been established. Up to an additional 30 percent of the mitigation credit may be used when all of wetland restoration components have been installed, including seeding/planting of the wetland, buffer, and uplands. The NDIRT may require a field inspection of the restoration and seeding activities before mitigation credits will be released. The remaining mitigation credit will be available for use after full achievement of the ecological performance standards as described in the mitigation bank instrument have been documented by the mitigation bank.

The creation of wetland habitat in a non-wetland, upland site is an acceptable mitigation technique; however, there is substantially greater uncertainty associated with this method. The availability of wetland mitigation credits developed through creation will follow the three milestone approach described above. Up to 10 percent of the total mitigation credit may be available for use when the mitigation bank instrument has been approved, the mitigation bank has been secured, and appropriate financial assurances have been established. An additional 15 percent may be used when the creation and planting activities are complete. The remainder of the mitigation credit will be available for use only after full achievement of the ecological performance standards described in the mitigation bank instrument.

If a mitigation bank sponsor has a proven track record of constructing successful mitigation projects and has demonstrated a willingness to resolve unanticipated issues, the NDIRT may consider the potential to release additional credits when the instrument is signed and the restoration work is completed. This flexibility will be considered for emergency projects and when other extenuating circumstances require action by the participating agencies.

The mitigation bank sponsor is responsible for establishing and maintaining a mitigation bank ledger documenting the beginning and ending balance of available credits. The ledger must clearly document all transactions, including the use of credits for each approved project and any other changes in the number of available mitigation credits. (e.g. additional credit released, credits suspended due to the delay or cancelation of a project). The sponsor is responsible for submitting an annual ledger report and will provide updates upon the request of the NDIRT.

XII. MITIGATION BANK MONITORING, EVALUATION, AND SUCCESS CRITERIA

Monitoring and evaluating mitigation banks is a vital part of the banking process. Interdisciplinary field reviews, including the bank sponsor and agency representatives with expertise in engineering, soils, plant communities, and wetland ecology, provide an excellent opportunity to review wetland mitigation banks. Monitoring field reviews have yielded tangible recommendations to strengthen both the mitigation review process and specific mitigation banks.

The mitigation bank monitoring plan should be based on the complexity of the mitigation plan and reliability of the mitigation measures being implemented. In general, mitigation plans that rely on creating new wetlands require greater monitoring to determine success than plans emphasizing the restoration of degraded wetland habitat. The NDIRT will work with wetland mitigation bank sponsors to identify a monitoring plan and success criteria for each wetland mitigation bank established in North Dakota. The monitoring plan will include site specific criteria commensurate with the objectives of the mitigation bank and the scope of the mitigation banking instrument. See Appendix E for the type of information commonly gathered to monitor mitigation wetlands and determine the success of a mitigation bank.

The bank sponsor is responsible for monitoring the mitigation bank in accordance with the signed mitigation bank instrument. Monitoring is designed to document the success of the mitigation bank and identify problems requiring remedial action, such as noxious weed infestations or an eroding ditch plug. Monitoring provisions need to be based on scientifically sound performance standards. Monitoring should be conducted at intervals appropriate for the particular project type and until the authorizing agency, in consultation with the NDIRT, is confident the mitigation bank will be successful (i.e., performance standards are attained). The period for monitoring will typically be five years; however, this timeframe may be extended for created or forested wetlands requiring a longer period to reach a stable condition or where remedial actions were implemented. The bank sponsor should submit annual monitoring reports to the authorizing agency in accordance with the terms specified in the mitigation bank instrument.

XIII. CONCLUSION

Mitigation banking is an efficient and effective method to compensate for the unavoidable wetland losses in an environmentally sound manner. Wetland mitigation banking is particularly beneficial for agencies and organizations developing needed projects that commonly result in wetland losses, such as highway projects, airport improvements, and agricultural activities. Through a coordinated partnership, mitigation banking provides highway departments, county water resource boards, other agencies, developers, and landowners with reliable, cost-effective procedures to plan and develop future projects. If you have questions concerning mitigation banking, please contact a member of the NDIRT to schedule a coordination meeting.

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Appendix B – Glossary

Credit: A unit of measurement (e.g., a functional capacity unit in the Hydrogeomorphic Assessment Method) representing the gain of aquatic function at a compensatory mitigation site; the measure of function is typically indexed to the number of acres or linear feet of resources restored, established, enhanced, or protected as compensatory mitigation.

Debit: A unit of measurement (e.g., a functional capacity unit in the Hydrogeomorphic Assessment Method) representing the loss of aquatic function at a project site; the measure of function is typically indexed to the number of acres or linear feet impacted by issuance of the permit.

Ecoregion: A large area of land or water containing a geographically distinct assemblage of species, natural communities, and similar environmental conditions that interact ecologically in ways critical for their long-term persistence.

Hydrogeomorphic Functional Assessments: Hydrogeomorphic (HGM) is a functional assessment that classifies a wetland according to hydrogeomorphic setting, identifies discrete functions for the various wetland classes, and uses reference wetlands as benchmarks for gauging relative levels of functioning. For more information go to United States Army Corps of Engineers web site at:
<http://el.ercdc.usace.army.mil/wetlands/hgmhp.html>

Hydrologic Unit Classification or HUC: A watershed classification system developed by the U.S. Geological Survey. Watersheds can be defined at different scales, from large basins, such as the entire drainage area of the Missouri River, to small sub-watersheds that feed a first-order stream. North Dakota is divided into two major drainage basins: the Missouri River Basin and Hudson Bay Drainage and numerous small sub-watersheds.

In-lieu Fee Programs: Programs involving the restoration, creation, enhancement, and/or preservation of aquatic resources through funds paid to a governmental or non-profit natural resource management entity to satisfy compensatory mitigation requirements. Similar to a mitigation bank, an in-lieu fee program sells mitigation credits to permittees or landowners whose obligation to provide compensatory mitigation is then transferred to the in-lieu fee program sponsor.

Mitigation or Compensatory Mitigation: The restoration, creation, enhancement, and/or in certain circumstances preservation of aquatic resources to compensate for the unavoidable adverse impacts which remain after all appropriate and practicable measures to avoid and minimize impacts has been achieved.

Mitigation Bank: A system of accounting for wetland loss and compensation, which can include one or more wetland mitigation sites. It is a site where wetlands are restored, enhanced, created, or in rare circumstances, preserved expressly for the purpose of providing compensatory mitigation in advance of authorized impacts to similar resources.

Mitigation Bank Instrument: A detailed, formal document prepared by the bank sponsor that provides the site-specific information necessary to develop, monitor, and maintain a mitigation bank. The banking instrument also establishes criteria for evaluating the success of a mitigation site. Appendix D provides a detailed outline describing the information that is typically provided in a mitigation bank instrument.

Mitigation Bank Prospectus: A brief written description of a proposed mitigation bank prepared by the bank sponsor. The prospectus identifies the purpose of the mitigation bank and provides a description of the location and land use patterns/habitats present at the proposed mitigation bank. The primary purpose of this document is to assess the feasibility of a proposed mitigation bank and determine if preparing a more detailed mitigation bank instrument is warranted. Appendix C provides an outline of the information that is typically provided in a mitigation bank prospectus.

Mitigation Bank Review Team (MBRT): An interagency group of federal, tribal, state, and/or local regulatory resource agency representatives who are signatory to a bank instrument and oversee the establishment, use, and operation of a mitigation bank.

Mitigation Bank Sponsor: Any public or private entity responsible for establishing and, in most circumstances, operating a mitigation bank.

Mitigation Ledger: Document to be used in the accounting of credits and debits. The ledger will be maintained by the bank sponsor and reviewed by the 'regulatory authority'.

Monitoring: A specific program of annual data collection which documents the physical, chemical, and biological characteristics of the mitigation bank, for the purpose of determining compliance with success criteria contained in the mitigation bank instrument/permit conditions. Typical monitoring periods for wetland and stream mitigation sites are five to ten years (depending on the type of wetland/stream class/system). (See Appendix E)

Protection (Site): A written discussion of the means of protecting the mitigation bank site. Methods include, but are not limited to, conservation easements or deed restrictions. Generally, state or local government, other Federal agencies such as the U.S. Fish and Wildlife Service, or non-governmental groups such as The Nature Conservancy hold conservation easements or land trusts.

Regional Service Area (RSA): The service area of a mitigation bank is the designated area wherein a bank can reasonably be expected to provide appropriate compensation for impacts to wetlands and/or other aquatic resources.

Scope and Effect Determination: Documentation of existing wetland drainage that is in place prior to restoration. A scope and effect determination consists of obtaining topographic survey data to document the size, depth, and elevation of each mitigation wetland. This information is used to determine the effectiveness of the drainage system to determine what, if any, wetland functions remain. Scope and effect determinations in combination with mitigation credit ratios are used to determine the amount of mitigation credit a mitigation bank will yield.

Site Plan: A detailed plan for each mitigation bank site that identifies all actions that will be undertaken to generate bank credits. Representative elements of the site development plan include plans for site grading, re-vegetation, erosion control, structures, management, and monitoring.

Slope Wetlands: Wetlands occur at points of surface changes, breaks in slope, or stratigraphic changes. Groundwater and runoff are the primary water sources. Water flow is unidirectional (down slope/gradient). Water may discharge to a stream, lake, or depression.

Success Criteria: The standards required to meet the objectives for which mitigation bank was established to include, but not limited to, hydrology, soil condition, and vegetative community. These success criteria should be sustainable. The success criteria are specific to each permit or banking instrument. (Note: Minimum Evaluation Criteria is the set of basic criteria ranges created to assist the MBRT in determining success criteria.)

Wetland: An area that has a predominance of hydric soils and is inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and under normal circumstances does support, a prevalence of hydrophytic vegetation typically adapted for life in saturated soil conditions.

Wetland Buffer: A transitional zone that provides a vegetated area between the wetland and the adjacent upland. The wetland buffer area is considered upland. The buffer enhances wetland functions by trapping sediment and filtering contaminants.

Wetland Complex: An area or tract of land that supports a diverse assemblage of wetland resources that vary in size, shape, water depth, and plant community. The diversity provided by a wetland complex increase its value as wildlife habitat.

Wetland Creation: The manipulation of the physical, chemical, and biological characteristics present at a site to develop an aquatic resource in an area that was historically non-wetland.

Wetland Enhancement: The manipulation of the physical, chemical, or biological characteristics of an aquatic resource to heighten, intensify, or improve a specific aquatic resource function(s). Enhancement results in the gain of selected aquatic resource function(s), but may also lead to a decline in other aquatic resource function(s). Enhancement does not result in a gain in resource area. In North Dakota, wetland

enhancement is currently limited to the establishment of buffers and grasslands adjacent to the mitigation wetlands.

Wetland Function: The physical, chemical, and biological processes that occur in aquatic ecosystems. The primary goal of compensatory mitigation is to replace lost aquatic resource functions. An example of a wetland function is water storage.

Wetland Preservation: The removal of a threat to, or preventing the decline of, aquatic resources by an action in or near those aquatic resources. This term includes activities commonly associated with the protection and maintenance of aquatic resources through the implementation of appropriate legal and physical mechanisms. Preservation does not result in a gain of aquatic resource area or functions.

Wetland Restoration: The manipulation of the physical, chemical, or biological characteristics of a wetland site with the goal of returning natural/historic functions to a former or degraded wetland basin. Restoration results in the net gain of both aquatic resource acreage and function. Examples of wetland restoration include plugging surface drains, disrupting drainage tile, removing accumulated sediment, and implementing a revegetation plan, if warranted.

Wetland Value: The utility or satisfaction humans obtain from aquatic resource functions. Values can be described in monetary terms or in qualitative terms, although many of the values associated with wetlands cannot be easily monetized. An example of a wetland value is flood control.

Wetland Water Regimes: Prairie pothole wetlands are commonly referred to by their water regime or how long the wetland basin typically ponds water during the growing season. The most common water regimes are temporary, seasonal, and semipermanent.

Temporary: Surface water is present for brief periods during the growing season. Plants that grow in both uplands and wetlands are characteristic of temporarily flooded wetlands.

Seasonal: surface water is present for extended periods especially early in the growing season, but is absent by the end of the season in most years.

Semipermanent: Surface water persists throughout the growing season in most years. In North Dakota, semipermanent wetlands typically support stands of either cattail or bulrush.

Appendix C: The Required Information in a Complete Mitigation Bank Prospectus

A complete prospectus includes the following information:

1. The objectives of the proposed mitigation bank or in-lieu fee program.
2. How the mitigation bank or in-lieu fee program will be established and operated.
3. The proposed service area.
4. The general need for and technical feasibility of the proposed mitigation bank or in-lieu fee program.
5. The proposed ownership arrangements and long-term management strategy for the mitigation bank or in-lieu fee project sites.
6. The qualifications of the sponsor to successfully complete the type(s) of mitigation project(s) proposed, including information describing any past such activities by the sponsor.
7. For a proposed mitigation bank, the prospectus must also address:
 - a. The ecological suitability of the site to achieve the objectives of the proposed mitigation bank, including the physical, chemical, and biological characteristics of the bank site and how that site will support the planned types of aquatic resources and functions; and
 - b. Assurance of sufficient water rights to support the long-term sustainability of the mitigation bank.
8. For a proposed in-lieu fee program, the prospectus must also include:
 - a. The compensation planning framework (see paragraph (c) of this section); and
 - b. A description of the in-lieu fee program account required by paragraph (i) of this section.

Appendix D: Fundamental Component of a Mitigation Plan or a Mitigation Bank Instrument

Information provided in the prospectus will serve as the basis for establishing the mitigation banking instrument. All mitigation banks need to have a banking instrument as documentation of agency concurrence on the objectives and administration of the bank. The banking instrument should describe in detail the physical and legal characteristics of the bank, and how the bank will be established and operated. For regional banking programs sponsored by a single entity (e.g., a state transportation agency), it may be appropriate to establish and “umbrella” instrument for the establishment and operation of multiple bank sites. In such circumstances, the need for supplemental site-specific information (e.g., individual site plans) should be addressed in the banking instrument. The banking instrument will be signed by the bank sponsor and the concurring regulatory and resource agencies represented on the Interagency Review Team. The following information should be address, as appropriate, within the banking instrument:

1. *Objectives.* A description of the resource type(s) and amount(s) that will be provided, the method of compensation (i.e., restoration, establishment, enhancement, and/or preservation), and the manner in which the resource functions of the compensatory mitigation project will address the needs of the watershed, ecoregion, physiographic province, or other geographic area of interest.
2. *Site selection.* A description of the factors considered during the site selection process. This should include consideration of watershed needs, onsite alternatives where applicable, and the practicability of accomplishing ecologically self-sustaining aquatic resource restoration, establishment, enhancement, and/or preservation at the compensatory mitigation project site.
3. *Site protection instrument.* A description of the legal arrangements and instrument, including site ownership, that will be used to ensure the long-term protection of the compensatory mitigation project site.
4. *Baseline information.* A description of the ecological characteristics of the proposed compensatory mitigation project site and, in the case of an application for DA permit, the impact site. This may include descriptions of historic and existing plant communities, historic and existing hydrology, soil conditions, a map showing the locations of the impact and mitigation site(s) or the geographic coordinates for those site(s), and other site characteristics appropriate to the type of resource proposed as compensation. The baseline information should also include a delineation of waters of the United States on the proposed compensatory mitigation project site. A prospective permittee planning to secure credits from an approved mitigation bank or in-lieu fee program only needs to provide baseline information about the impact site, not the mitigation bank or in-lieu fee project site.

5. *Determination of credits.* A description of the number of credits to be provided, including a brief explanation of the rationale for this determination. For permittee-responsible mitigation, this should include an explanation of how the compensatory mitigation project will provide the required compensation for unavoidable impacts to aquatic resources resulting from the permitted activity. For permittees intending to secure credits from an approved mitigation bank or in-lieu fee program, it should include the number and resource type of credits to be secured and how these were determined.
6. *Mitigation work plan.* Detailed written specifications and work descriptions for the compensatory mitigation project, including, but not limited to, the geographic boundaries of the project; construction methods, timing, and sequence; source(s) of water, including connections to existing waters and uplands; methods for establishing the desired plant community; plans to control invasive plant species; the proposed grading plan, including elevations and slopes of the substrate; soil management; and erosion control measures. For stream compensatory mitigation projects, the mitigation work plan may also include other relevant information, such as planform geometry, channel form (e.g., typical channel cross-sections), watershed size, design discharge, and riparian area plantings.
7. *Maintenance plan.* A description and schedule of maintenance requirements to ensure the continued viability of the resource once initial construction is completed.
8. *Performance standards.* Ecologically-based standards that will be used to determine whether the compensatory mitigation project is achieving its objectives.
9. *Monitoring requirements.* A description of parameters to be monitored in order to determine if the compensatory mitigation project is on track to meet performance standards and if adaptive management is needed. A schedule for monitoring and reporting on monitoring results to the district engineer must be included.
10. *Long-term management plan.* A description of how the compensatory mitigation project will be managed after performance standards have been achieved to ensure the long-term sustainability of the resource, including long-term financing mechanisms and the party responsible for long-term management.
11. *Adaptive management plan.* A management strategy to address unforeseen changes in site conditions or other components of the compensatory mitigation project, including the party or parties responsible for implementing adaptive management measures. The adaptive management plan will guide decisions for revising compensatory mitigation plans and implementing measures to address

both foreseeable and unforeseen circumstances that adversely affect compensatory mitigation success.

12. *Financial assurances.* A description of financial assurances that will be provided and how they are sufficient to ensure a high level of confidence that the compensatory mitigation project will be successfully completed, in accordance with its performance standard.

Appendix E - Monitoring and Success Criteria

Monitoring Parameters:

Wetlands will be monitored until hydrology and vegetation in disturbed areas is successfully established according to prescribed design criteria.

Buffers, as required by agreement, will be monitored for continuity, width, and species composition until successfully established and thereafter for noxious weed invasion and encroachment.

Success Criteria:

Hydrophytic Vegetation: Success criteria for hydrophytic vegetation are met when the plant community has developed that meets the design criteria for the restored or created wetland. At a minimum, the wetland must meet the approved design criteria or meet/exceed the hydrophytic plant community criteria found in the 1987 Corps of Engineers Wetland Delineation Manual. *See below

Hydrology – Success criteria for hydrology is met when the wetland is inundated or saturated for the time period indicated in the design criteria for the restored or created wetland. At a minimum, the wetland must meet the approved design criteria or meet/exceed the hydrology criteria found in the 1987 Corps of Engineers Wetland Delineation Manual. *See below

Soils: Success criteria are met when the soils met one of the field indicators of hydric soils. Current Field Indicators of Hydric Soils of the United States can be found at ftp://ftp-fc.sc.egov.usda.gov/NSSC/Hydric_Soils/FieldIndicators_v6_0.pdf

Buffers: Success criteria will be based on the requirements of the restoration plan. Width, continuity, and species composition will meet the requirements of the plan.

Monitoring Report Outline

- I. Introduction – Indicate pertinent information unique to mitigation bank site
 1. Site location (PLSS), name, county, etc.
 2. Map of site location with regard to closest recognizable landmark.
 3. Map of overall site with control structures and wetlands numbered.
- II. Brief description of mitigation site
 1. Include what work has been done prior to this monitoring report.
 2. Describe wetland types/acres, stream types/linear feet buffers, landscape, etc.
- III. Methods
 1. Describe type and location of transects.
 2. Describe method used for sampling vegetation, soil, hydrology, and water quality.

- a. A minimum of 2 paired test holes for each wetland, one within and the other outside the monitored wetland.
 - b. The vegetative transect will have, at a minimum, one Daubenmire quadrat (3 ft. sq.) per vegetative community with percent species present.
3. Describe sampling frequency, duration, and date (vegetation, soils, and hydrology).
- IV. Results, Discussion and Conclusions (include field sheets as appendix)

- 1. Each wetland individually, should include the following:
 - a. Map of wetland.
 - i. Labels on map include:
 - 1. Photo posts.
 - 2. Vegetative transects.
 - 3. Soils sampling locations.
 - 4. Wetland number.
 - b. Vegetation description
 - i. Dominance test results, with applicable transects.
 - ii. Species present (common or scientific name) and percent recorded within Daubenmire Quadrat (point 2 above).
 - iii. Comparative analysis of seed mix versus present species (if available).
 - iv. Discuss buffers if included in transects, if not- refer to IV1f below.
 - c. Hydrology description (hydro period, depth, etc.)
 - i. USACE indicators present.
 - d. Soils description, table
 - i. Hydric features.
 - ii. Munsell color, depth, horizons, etc..
 - e. Photographs
 - i. Taken in each cardinal direction 20 ft. from a centrally positioned permanent photo post.
 - ii. Also taken from vegetation transect endpoints facing center of wetland.
 - iii. Record azimuth of each photo taken.
 - f. Buffers (if not included in vegetation transect data)
 - i. Width- note any encroachments.
 - ii. Continuity- compare continuity of buffer with design – note any deficiencies.
 - iii. Species composition – list the species in the buffer and compare to planted species.

***Hydrophytic Vegetation Success Criteria**

Success criteria for hydrophytic vegetation will be met if the wetland plant community passes the dominance test as outlined in the 1987 Corps Wetland Delineation Manual. The procedure has two tests that can be used.

Dominant Species by the 50/20 Rule: Dominant plant species are the most abundant species in the community; they contribute more to the character of the community than do the other non-dominant species present. The 50/20 rule is the recommended method for selecting dominant species from a plant community when quantitative data are available. For rapid wetland determinations in relatively simple plant communities, a qualitative assessment of dominant species is often adequate and may be more efficient and economical than more intensive vegetation sampling protocols. This option is most often applicable to plant communities that consist of nearly uniform or monotypic stands with low species diversity, low spatial heterogeneity, and abrupt boundaries between different vegetation communities or zones.

If the plant community passes this dominance test, the vegetation is hydrophytic.

Prevalence index: The prevalence index is ≤ 3.0 . The prevalence index is a weighted-average wetland indicator status of all plant species in the sampling plot, where each indicator status category is given a numeric code (OBL = 1, FACW = 2, FAC = 3, FACU = 4, and UPL = 5) and weighting is by abundance (percent cover). The prevalence index is a more comprehensive analysis of the hydrophytic status of the community than one based on just a few dominant species. It is particularly useful (1) in communities with only one or two dominants, (2) in highly diverse communities where many species may be present at roughly equal coverage, and (3) when strata differ greatly in total plant cover (e.g., total herb cover is 80 percent but sapling/shrub cover is only 10 percent). The prevalence index is used in this supplement to determine whether hydrophytic vegetation is present on sites where indicators of hydric soil and wetland hydrology are present but the vegetation initially fails the dominance test.

User Notes: At least 80 percent of the total vegetation cover on the plot (summed across all strata) must be of species that have been correctly identified and have an assigned wetland indicator status (including UPL for species not recorded on the list of wetland plants (Reed 1988)).

PERMANENT PHOTO-POINT MONITORING

Repeated photographs taken at permanent locations are an effective and efficient method for long-term monitoring. When using this method, it is important to: 1) use similar techniques, 2) identify the date and location within the picture, 3) take the picture during the same stage of plant growth, 4) include the same skyline in the landscape picture, and 5) carefully relocate the photo points each time. It is also important to maintain consistency in camera type (lens size), film, timing, and associated documentation.

Repeated landscape scale photographs can provide basic documentation of trends. Landscape photos should be taken from the same designated point at approximately the same time of year. Photographs that include a distinctive landmark in the background or on the horizon are easier to relocate. It is very difficult to locate previously established photo points without a portion of the horizon in the photograph. Previous photographs (or photocopies) can also be helpful in "framing" the photo consistently from year to year.

Equipment

- Photo Point Transect form
- Two, six foot folding carpenter rulers or other suitable device to provide a reference scale.
- A metal or plastic stake for marking the photo point.
- Camera (digital or 35mm with print film) and Photo Information Sheet.
- Tripod to ensure consistent photo height.
- GPS to record lat/long in cases where photo post becomes compromised.

Procedure

- Establish the photo point and install a permanent marker stake. The stake should be driven into the soil to a depth at which it can be located but will not attract animals, injure an animal, or puncture a tire. Record GPS coordinates to assist in re-locating the point.
- Approximately 20 feet from photo post, take a total of 4 photos in each cardinal direction facing post best illustrating wetland landscape, recording the azimuth.
- Use the Photo Information Sheet in all photographs, if possible. You will have a total of 4 photos per photo post.
- Additional photos at each end of the vegetative transect facing the interior of the wetland will also be taken. The vegetative endpoints are already recorded with GPS, only azimuth of photo direction is required.

Things to remember

- If retaking photos, try to match the position and azimuth of previous photos.
- If the photo plot is difficult to locate, use a witness post. Make sure the photo plot is at least 20 feet away from the post. For all photo points, consistently document the photo plot location with respect to the witness post.

- Photo information should be included within the report under the results section on a wetland by wetland basis.
 - Azimuth recorded in photo captions.
 - Photo post location and vegetative transect endpoints included on map of wetland.

- Avoid casting a shadow into the photo if possible.

- Photos should be repeated at the same time of the growing season.

Photo Information Sheet (optional)

Transect ID: _____ Date: _____ Observer: _____

Mitigation Site Name: _____

Wetland name or number: _____

Photo point location: _____

GPS coordinates: _____

Direction photo was taken: _____

Photo subject: _____

Purpose of photo: _____

MITIGATION MONITORING REPORT (optional)

Report No. []

Part I – Background Information

Project Name: _____ County: _____

Nature of Mitigation: _____ Mitigation Location: _____

Permit No.: (if applicable) Date Mitigation Complete: ___/___/___ Inspection Date: ___/___/___

Inspected By: _____ Permittee's Signature: (if applicable) _____

Part II – Mitigation Site Condition

1. Is the mitigation site showing any observable sign(s) of revegetation, organic debris, movement, erosion, silting-in, flooding, expansion, human use, or other observable change(s) that you may have identified or no observable change(s) from the as-built plans? (Circle all applicable) Explain (optional): _____

Part III – Mitigation Site Photography

Photographic Reference. A representative number of photographs shall be required and taken depicting the entire mitigation site. One complete and marked set of photographs shall be provided to the Corps.