

# Draft Comprehensive Conservation Plan and Environmental Assessment

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*Sand Lake Wetland Management District*

**South Dakota**

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# Summary



Ryan Hagerty / USFWS

*White-tailed Deer*

Every year, millions of migratory waterfowl and other waterbirds find their way to a mosaic of wetlands and grasslands in eastern South Dakota. These habitats provide the untiring winged travelers with the sanctuary and nourishment necessary to procreate, giving rise to the future generations of migratory birds that will populate North America's Central Flyway. These lands are also of critical importance to a myriad of other endemic fish, wildlife, and plant species, and they provide thousands of sportsmen and wildlife enthusiasts with places to experience the wonders of the natural world and partake in its bounty.

It is the responsibility of the U.S. Fish and Wildlife Service to preserve the integrity of these important habitats for the benefit of fish and wildlife, as well as for the continuation of compatible outdoor recreational uses derived therein. The Service accomplishes this through a network of federally managed lands dedicated to the preservation of fish, wildlife, plants, and the habitats upon which they depend—the National Wildlife Refuge System.

## The Districts

The Huron Wetland Management District, Madison Wetland Management District, and Sand Lake Wetland Management District are units of the Refuge

System that manage small tracts of fee-owned Federal lands called waterfowl production areas, administer easement programs to preserve privately owned wetlands and grasslands, and conserve other tracts of lands ceded to the Service through different authorities, such as former Farmers Home Administration lands. Together, these three districts encompass 27 counties in eastern South Dakota, where their staffs manage approximately 1.5 million acres of land including more than 378,000 acres in wetlands easements, nearly 630,000 acres in grassland easements, more than 100,000 acres of fee-owned lands distributed in 445 waterfowl production areas, and miscellaneous other tracts of land.

All 445 waterfowl production areas managed by these districts are open to the public to engage in compatible wildlife-dependent recreational uses, of which hunting and fishing, followed by wildlife observation and photography, are the ones that attract the greatest number of visitors each year. Biannual bird migrations each spring and fall attract thousands of local residents as well as tourists from around the world to experience this breathtaking display of one of nature's profound cycles. Environmental education and interpretation are other compatible public uses that take place at certain designated sites within each district, usually requiring closer involvement of district staffers.

## VISION FOR THE DISTRICTS

*Clear blue skies frame spectacular views of grasslands and wetlands teeming with migratory waterfowl and other wildlife in the Huron, Madison, and Sand Lake Wetland Management Districts. Here, future generations will experience the whistle of the northern pintail, the song of the western meadowlark, and the distant boom of the prairie chicken. Located in the Prairie Pothole Region of South Dakota, these districts preserve timeless landscapes in the face of change. Conservation of these lands is achieved through hard work and the support of friends and neighbors who value natural places as an essential component of their quality of life.*

## GOALS FOR THE DISTRICTS

### Native Prairie

Conserve, restore, and improve the biological integrity and ecological function of the native prairies to support healthy populations of native plants and wildlife and promote the natural role of fire and grazing in shaping and managing these landscapes.

### Planted Grasslands

Manage planted grasslands to contribute to the production and growth of continental waterfowl populations, other migratory birds, threatened and endangered species, and other wildlife.

### Wetlands

Protect, restore, and enhance prairie pothole wetlands to support diverse plant communities and provide habitat to waterfowl, shorebirds, wading birds, and associated wetland-dependent wildlife.

### Research and Monitoring

Provide a learning platform that uses science, monitoring, applied research, and adaptive management to advance understanding of the Prairie Pothole Region and management of these areas.

### Consumptive Uses

Provide visitors with quality opportunities to enjoy hunting, fishing, and trapping in waterfowl production areas and expand their knowledge and appreciation of the prairie landscape and the National Wildlife Refuge System.

### Nonconsumptive Uses

Provide visitors with quality opportunities to enjoy, observe, photograph, and appreciate the prairie ecosystem while expanding their knowledge of and support for the National Wildlife Refuge System.

### Operations and Administration

Through effective communication and innovative partnerships, secure and efficiently utilize funding, staffing, and volunteer programs for the benefit of all natural resources in the districts.

### Partnerships

Promote and develop partnerships with landowners, public and private organizations, and other interested individuals to maintain, restore, and enhance a diverse and productive landscape in the Prairie Pothole Region.

### Environmental Education and Interpretation

Provide quality educational opportunities for persons of all abilities to learn about, understand, and appreciate prairie landscapes and the role of the National Wildlife Refuge System.

## Planning Process and Issues

The comprehensive conservation planning process for these districts began in April 2008 with public notices on the Service's intent to prepare this plan, seek public input, hold public meetings, and identify key issues to be addressed in the plan. The following is a summary of the issues identified and that are covered within the scope of this plan.

### WETLAND AND UPLAND HABITATS

Wetland and upland habitats within the planning area are in need of protection and enhancement. The current and likely future staffing situation at the districts requires that habitat management and protection be carefully evaluated and eventually follow a system of prioritization so that the districts can fulfill the purposes for which they were established.

### INVASIVE PLANTS

Previously farmed lands that have been restored to a semblance of native prairie are compromised by invasive plant species such as leafy spurge, Canada thistle, sow thistle, and absinth wormwood. Other invasive plants of concern to the districts, and that substantially degrade the quality and suitability of habitats for wildlife species, include smooth brome, Kentucky bluegrass, and crested wheatgrass.

### ENERGY DEVELOPMENT

Increasing demand for energy, particularly in the form of biofuel and wind energy production, is becoming a great concern for the districts due to these industries'

potential to affect wildlife habitat quality and integrity. The Service needs to study and analyze ways in which to support our Nation's increasing energy needs while affording adequate protection to fish, wildlife, plants, and the habitats on which they depend.

## PRAIRIE CONVERSION

Conversion of native prairie to agricultural, urban, and other uses is of great concern to the Service and to many conservation and traditional ranching advocacy groups. The districts play a preeminent role in helping to preserve and enhance remaining prairie lands in South Dakota, as well as in helping to restore degraded or previously converted lands back to native prairie.

## PREDATOR MANAGEMENT

Because of modifications to native prairie and other factors, the populations of several predatory species have increased above their historical levels. This situation adversely affects the ability and success of grassland-nesting bird species, including waterfowl and other migratory birds, to maintain or increase sustainable population levels. The Service needs to find ways to counter these deleterious effects in order to fulfill the purposes for which the districts were established.

## VISITOR SERVICES

There is an increasing demand by local residents and tourists for places to engage in outdoor recreational opportunities. The districts, through the six wildlife-dependent priority uses—hunting, fishing, wildlife observation, photography, environmental education, and interpretation—are uses currently authorized on lands administered by the districts. A growing demand for public recreation in South Dakota and the nation makes these six wildlife-dependent recreational uses, as specified in the National Wildlife Refuge System Improvement Act, an issue of primary interest.

## PARTNERSHIPS

The Service puts a high priority on working in partnership with conservation and agricultural groups to support conservation programs such as Federal Farm Bill legislation, South Dakota Game, Fish and Parks projects, water quality and watershed projects, and private conservation efforts.

## OPERATIONS

Funding and staff are not sufficient to fulfill the districts' purposes or to meet their goals. Consequently, identification of priorities and efficient direction of resources will always be an issue. The Service's staff needs to identify and describe unfunded needs to be able to compete effectively for additional money from within the Service as well as from partners and other sources. District facilities need to be evaluated and upgraded.



© Chris Bailey

*American Kestrel*

## MONITORING AND RESEARCH

Monitoring habitat and wildlife populations is an essential element in achieving the districts' primary goals and objectives. Basic data about recruitment, mortality, and habitat use for a representative group of species must be collected and analyzed on a regular basis to make appropriate decisions for maintaining the viability of the habitats on which these species depend. Using the districts for field research could contribute to new directions in management and expand the knowledge of field biologists.

## The Draft Plan

The Service has prepared this document with public participation. After reviewing a wide range of public issues and comments as well as management needs, the Service developed three management alternatives for the districts. Alternative B, the proposed action, is presented in chapter 6 as the draft comprehensive conservation plan.

## Management Direction

Management of the three districts will emphasize developing and implementing an improved, science-based priority system to restore native prairie habitats for the benefit of waterfowl and other migratory birds. District staff will focus on high-priority tracts and, when possible, on medium-priority tracts. The focus of this alternative is to restore ecological processes and native grassland species to the greatest extent possible within the parameters of available resources and existing constraints. District staff will seek to maintain the existing levels and types of public use programs, ensuring that programs offered to the public are of consistently high quality.



# Abbreviations

<b>Administration Act</b>	National Wildlife Refuge System Administration Act of 1966
<b>APHIS</b>	Animal and Plant Health Inspection Service
<b>BAER</b>	Burned Area Emergency Response
<b>BAR</b>	Burned Area Rehabilitation
<b>BCC</b>	Birds of Conservation Concern
<b>BCR</b>	bird conservation region
<b>BIDEH</b>	Biological Integrity, Diversity, and Environmental Health
<b>BMP</b>	best management practice
<b>CCP</b>	comprehensive conservation plan
<b>CFR</b>	Code of Federal Regulations
<b>CO<sub>2</sub></b>	carbon dioxide
<b>CRP</b>	Conservation Reserve Program
<b>CWCS</b>	comprehensive wildlife conservation strategy
<b>CWD</b>	chronic wasting disease
<b>districts</b>	Huron, Madison, and Sand Lake Wetland Management Districts
<b>DOI</b>	U.S. Department of Interior
<b>DPS</b>	Distinct Population Segment
<b>DNC</b>	dense nesting cover
<b>Duck Stamp Act</b>	Migratory Bird Hunting and Conservation Stamp Act
<b>EA</b>	environmental assessment
<b>EO</b>	Executive order
<b>ESA</b>	Endangered Species Act
<b>EPA</b>	U.S. Environmental Protection Agency
<b>FmHA</b>	Farmers Home Administration
<b>FMP</b>	Fire Management Plan
<b>FTE</b>	full-time equivalent
<b>GIS</b>	geographic information system
<b>HAPET</b>	Habitat and Population Evaluation Team
<b>HFI</b>	Healthy Forests Initiative
<b>HPAI</b>	Highly Pathogenic Avian Influenza
<b>Improvement Act</b>	National Wildlife Refuge System Improvement Act of 1997
<b>IPM</b>	integrated pest management
<b>NAAQS</b>	national ambient air quality standards
<b>NABCI</b>	North American Bird Conservation Initiative
<b>NAWCA</b>	North American Wetlands Conservation Act
<b>NAWMP</b>	North American Waterfowl Management Plan
<b>NEPA</b>	National Environmental Policy Act of 1969
<b>NFP</b>	National Fire Plan
<b>NGO</b>	nongovernmental organization
<b>NHPA</b>	National Historic Preservation Act
<b>NPAM</b>	Native Prairie Adaptive Management

<b>Partners Program</b>	Partners for Fish and Wildlife Program
<b>P.L.</b>	Public Law
<b>PPJV</b>	Prairie Pothole Joint Venture
<b>RECD</b>	Rural Economic and Community Development
<b>RLGIS</b>	Refuge Land Geographic Information System
<b>SDDOT</b>	South Dakota Department of Transportation
<b>SDGFP</b>	South Dakota Game, Fish and Parks
<b>Service</b>	U.S. Fish and Wildlife Service
<b>SIP</b>	State Implementation Plan
<b>SUP</b>	special use permit
<b>SWG</b>	State Wildlife Grant
<b>System</b>	National Wildlife Refuge System
<b>U.S.C.</b>	United States Code
<b>USDA</b>	U.S. Department of Agriculture
<b>USGS</b>	U.S. Geological Survey
<b>VCS</b>	visitor contact station
<b>VOR</b>	visual obstruction reading
<b>WMD</b>	wetland management district
<b>WNV</b>	West Nile virus
<b>WPA</b>	waterfowl production area

*Definitions of these and other terms are in the glossary, located after chapter 6.*

# CHAPTER 1— Introduction



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*Student Conservation Association intern Shannon Crawford releases a banded duck.*

The Service (U.S. Fish and Wildlife Service) has developed this draft CCP (comprehensive conservation plan) to provide a foundation for the management and use of the Huron, Madison, and Sand Lake Wetland Management Districts (WMDs, or districts), located in north central and eastern South Dakota (figure 1). When finalized, the CCP will serve as a working guide for management programs and actions for these three districts over the next 15 years.

This draft CCP was developed in compliance with the Improvement Act (National Wildlife Refuge System Improvement Act of 1997) and Part 602 (National Wildlife Refuge System Planning) of “The Fish and Wildlife Service Manual.” The actions described in this draft CCP and EA (environmental assessment) meet the requirements of NEPA (National Environmental Policy Act of 1969). NEPA compliance is being achieved through public involvement and the analyses presented in this document.

The final CCP will specify the actions necessary to achieve the vision and purposes of the districts. Wildlife is the first management priority in all units of the System (National Wildlife Refuge System), and public use (wildlife-dependent recreation) is allowed

and encouraged as long as it is compatible with the districts’ purposes.

The draft CCP and EA has been prepared by a planning team composed of representatives from various Service programs, including the Division of Refuges, the Division of Realty, and the Division of Visitor Services and Communications. In addition, the planning team used public input. Public involvement and the planning process are described in section 1.6, “Planning Process.”

After reviewing a wide range of public comments and management needs, the planning team developed alternatives for management of the three districts. The team recommended one alternative as the Service’s proposed action. This action addresses all substantive issues while determining how best to achieve the districts’ purposes. The proposed action is the Service’s recommended course of action for management of these districts. The proposed action is summarized in chapter 3, “Alternatives,” with its predicted effects described in chapter 5, “Environmental Consequences.” The details of the proposed action constitute the draft CCP (chapter 6, “Implementation of the Proposed Action”).

## 1.1 Purpose and Need for the Plan

The purpose of this draft CCP is to identify the role that these districts will play in support of the System's mission and to provide long-term guidance for management of the districts' programs and activities. The CCP is needed to:

- communicate with the public and other partners in efforts to carry out the System's mission;
- provide a clear statement of direction for management of the three districts;
- provide neighbors, visitors, and government officials with an understanding of the Service's management actions on and around the districts;
- ensure that the Service's management actions are consistent with the mandates of the Improvement Act;
- ensure that management of these districts is consistent with Federal, State, and county plans;
- provide a basis for development of budget requests for the districts' operations, maintenance, and capital improvement needs.

Sustaining the nation's fish and wildlife resources is a task that can be accomplished only through the combined efforts of governments, businesses, and private citizens.

## 1.2 The U.S. Fish and Wildlife Service and the Refuge System



The Service is the principal Federal agency responsible for fish, wildlife, and plant conservation. The Service's mission, working with others, is to conserve, protect, and enhance fish and wildlife and their habitats for the continuing benefit of the American people. The National Wildlife Refuge System is one of the Service's major programs.

### OVERVIEW

More than a century ago, America's fish and wildlife resources were declining at an alarming rate. Concerned citizens, scientists, and hunting and angling groups

joined together to restore and sustain America's national wildlife heritage. This was the genesis of the U.S. Fish and Wildlife Service.

Today, the Service enforces Federal wildlife laws, manages migratory bird populations, restores nationally significant fisheries, conserves and restores vital wildlife habitat, protects and recovers endangered species, and helps other governments with conservation efforts. In addition, the Service administers a Federal aid program that distributes hundreds of millions of dollars to States for fish and wildlife restoration, boating access, hunter education, and related programs across America.

In 1903, President Theodore Roosevelt designated the 5.5-acre Pelican Island in Florida as the nation's first wildlife refuge for the protection of brown pelicans and other native nesting birds. This was the first time the Federal Government set aside land for wildlife. This small but significant designation was the beginning of the National Wildlife Refuge System.

One hundred years later, the System has become the largest collection of lands in the world specifically managed for wildlife, encompassing more than 150 million acres in 550 refuges and more than 3,000 small areas for waterfowl breeding and nesting. Today, there is at least one refuge in every State and in five U.S. territories and commonwealths.

In 1997, the Improvement Act established a clear mission for the System.

*The mission of the System is to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife and plant resources and their habitats within the United States for the benefit of present and future generations of Americans.*

The Improvement Act states that each national wildlife refuge (that is, each unit of the System, which includes wetland management districts) shall be managed:

- to “fulfill the mission of the System, as well as the specific purposes for which that refuge was established”;
- to consider “wildlife conservation ... [as] the singular National Wildlife Refuge System mission” (Final Compatibility Regulations Pursuant to the National Wildlife Refuge System Improvement Act of 1997);
- to “ensure that the biological integrity, diversity, and environmental health of the System are maintained”;

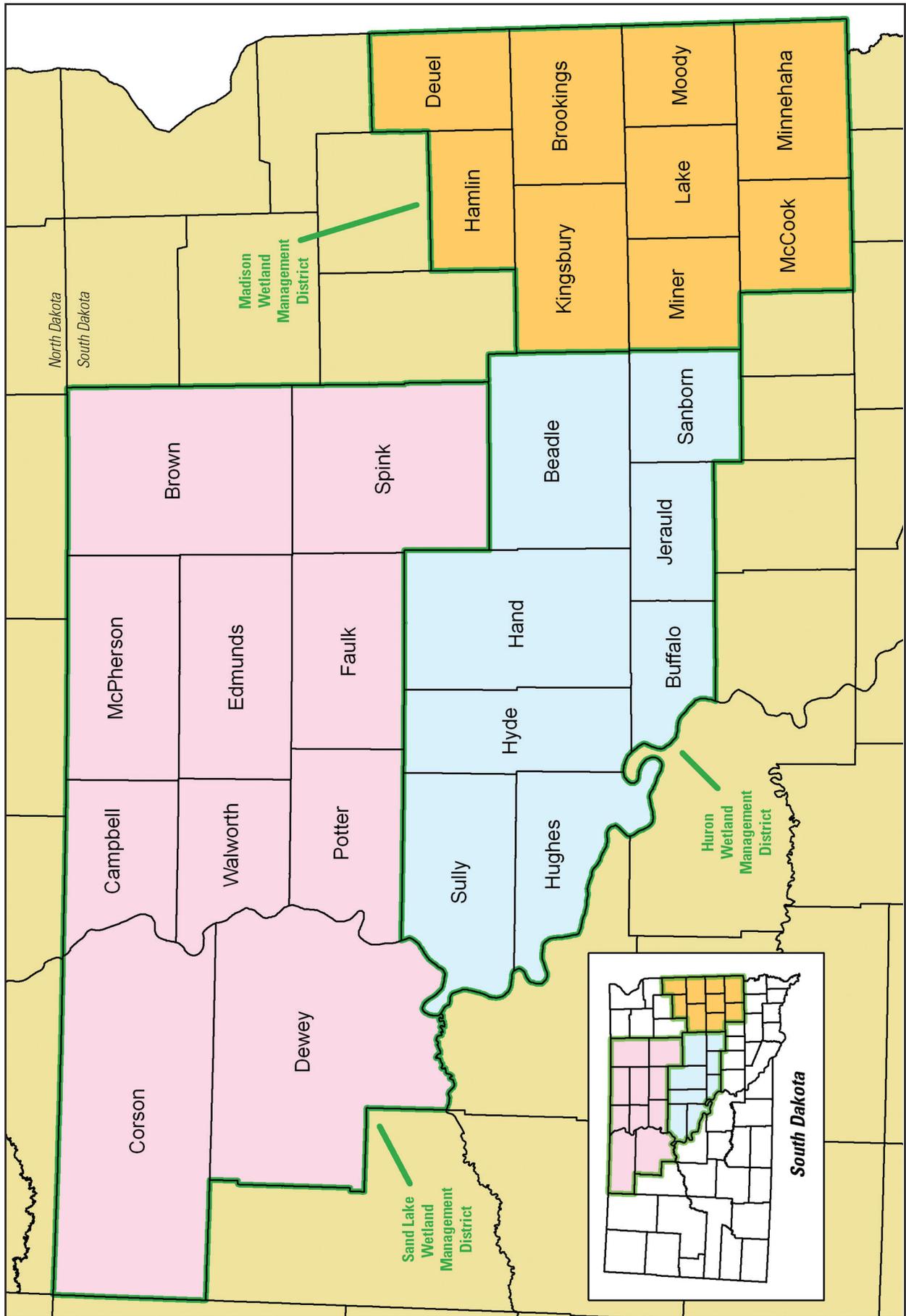


Figure 1. Vicinity map of the three districts, South Dakota.

- to fulfill the requirements of preparing “a comprehensive conservation plan ... for each refuge within 15 years after the date of enactment of the ... Act” and of ensuring opportunities for “public involvement in the preparation and revision of [these] plans”;
- to recognize that “compatible wildlife-dependent recreation [fishing, hunting, wildlife observation and photography, and environmental education and interpretation] is a legitimate and appropriate general public use of the System”;
- to retain the authority of a refuge manager to “make ... the compatibility determination” after exercising “sound professional judgment ... regarding wildlife conservation and uses of the National Wildlife Refuge System” (Final Compatibility Regulations Pursuant to the National Wildlife Refuge System Improvement Act of 1997).

In addition to the System’s mission, the wildlife and habitat vision for each unit of the System stresses the following principles:

- Wildlife comes first.
- Ecosystems, biodiversity, and wilderness are vital concepts in refuge and district management.
- Habitats must be healthy.
- Growth of refuges and districts must be strategic.
- The System serves as a model for habitat management with broad participation from others.

Following passage of the Improvement Act, the Service immediately began to carry out the direction of the new legislation, including preparation of CCPs for all national wildlife refuges and wetland management districts. Consistent with the Improvement Act, the Service prepares all CCPs in conjunction with public involvement. Each refuge and each district is required to complete its CCP within the 15-year schedule (by 2012).

## PEOPLE AND THE REFUGE SYSTEM

The Nation’s fish and wildlife heritage contributes to the quality of American lives and is an integral part of the country’s greatness. Wildlife and wild places have always given people special opportunities to have fun, relax, and appreciate the natural world.

Wildlife recreation contributes millions of dollars to local economies through bird watching, fishing, hunting, photography, and other wildlife pursuits. Nearly 35 million people visited national wildlife refuges in 2006 (Caudill and Carver 2007), mostly to observe wildlife in their natural habitats. Visitors experience nature trails, auto tours, interpretive programs, and hunting and fishing opportunities. Local communities that surround the refuges and districts derive significant economic benefits from refuge-related activities.

Economists report that System visitors contribute more than \$1.7 billion annually to local economies (Caudill and Carver 2007). These figures do not include Alaska or the Pacific Island refuges, which together hosted more than 2 million visitors in 2006.

## COMPATIBLE USES IN THE REFUGE SYSTEM

Lands within the System differ from multiple-use Federal lands in that they are closed to all public uses unless specifically and legally opened. A refuge or district use is not allowed unless the Service determines the use to be appropriate and compatible. A *compatible* use is one that, in the sound professional judgment of the project leader, will not materially interfere with or detract from the fulfillment of the System’s mission or the purposes of the refuge or district. Sound professional judgment is defined as a decision that is consistent with the principles of fish and wildlife management and administration, the available science and resources, and adherence to law.

A compatibility determination is the written documentation that a proposed or existing use of a national wildlife refuge or wetland management district is or is not a compatible use. The determination is completed, signed, and dated by the project leader with the concurrence of the System’s assistant regional director. Compatibility determinations are typically completed as part of the process for a CCP or step-down management plan. Once a final compatibility determination is made, it is not subject to administrative appeal.

The Improvement Act states that six priority uses—hunting, fishing, wildlife observation, photography, interpretation, and environmental education—should receive consideration in planning and management over other public uses. All facilities and activities associated with recreational uses, or where there is an economic benefit associated with a use, require compatibility determinations. However, refuge or district management activities such as prescribed fire or invasive plant control do not require compatibility determinations.

The draft compatibility determinations for these districts are presented in appendix A and are available for public review and comment as part of the draft CCP and EA.

## SERVICE ACTIVITIES IN SOUTH DAKOTA

Service activities in South Dakota contribute to the State’s economy, ecosystems, and education programs. The following list summarizes the Service’s presence and activities:

- employ 173 people in South Dakota
- assisted by 191 volunteers donating more than 8,000 hours in the following areas:
  - more than 4,000 hours for wildlife and habitat
  - nearly 1,500 hours for maintenance work

- 1,350 hours for wildlife-dependent recreation
- 1,165 hours in miscellaneous other activities related to Service work
- manage two national fish hatcheries encompassing 591.79 acres and one fish and wildlife management assistance office
- manage seven national wildlife refuges encompassing a total of 103,884.85 acres
- manage six wetland management districts across 50 South Dakota counties comprising the following:
  - 160,432.41 fee acres (waterfowl production areas [WPAs])
  - 591,308.44 wetland easement acres
  - 705,532.59 grassland easement acres
  - 712.23 flowage and miscellaneous easement acres
  - 40,875.90 Farmer's Home Administration easements
- host more than 202,000 annual visitors to Service-managed lands:
  - more than 93,000 hunting visits
  - nearly 45,000 fishing visits
  - more than 57,500 wildlife observation visits
  - environmental education programs for nearly 7,000 students
  - a currently unknown number of trapping visits
- provide \$4,668,784 to SDGFP (South Dakota Game, Fish and Parks) for sport fish restoration and \$8,793,314 for wildlife restoration and hunter education
- employ eight Partners for Fish and Wildlife program managers, who have helped private landowners restore wetland and upland habitats as shown below:
  - Huron WMD
    - 517 wetlands restored (1,805 acres)
    - 298 wetlands established (1,149 acres)
    - 173 upland sites restored (6,467 acres)
    - 193 upland sites (grazing systems) enhanced (100,842 acres)
  - Madison WMD
    - 1,701 wetlands restored (5,934 acres)
    - 251 wetlands established (528 acres)
    - 180 upland sites restored (8,897 acres)
    - 141 upland sites (grazing systems) enhanced (31,097 acres)
  - Sand Lake WMD
    - 177 wetlands restored (719 acres)
    - 383 wetlands established (1,809 acres)
    - 122 upland sites restored (6,384 acres)
    - 221 upland sites (grazing systems) enhanced (84,712 acres)
- make payments to counties through the Refuge Revenue Sharing Act (Public Law [P.L.] 95-469,

amended 1978); payments for fee title lands are based on the greatest of three-quarters of 1 percent of the fair market value (appraisals are completed every 5 years), 25 percent of net receipts, or \$0.75 per acre

## 1.3 National and Regional Mandates

System units are managed to achieve the System's mission and goals, along with the designated purpose of the refuges and districts (as described in establishing legislation, executive orders, or other establishing documents). Key concepts and guidance of the System are in the Administration Act (National Wildlife Refuge System Administration Act of 1966), Title 50 of the CFR (Code of Federal Regulations), "The Fish and Wildlife Service Manual," and the Improvement Act.

The Improvement Act amends the Administration Act by providing a unifying mission for the System, a new process for determining compatible public uses on refuges and districts, and a requirement that each refuge and district be managed under a CCP. The Improvement Act states that wildlife conservation is the priority of System lands and that the Secretary of the Interior will ensure that the biological integrity, diversity, and environmental health of refuge lands are maintained. The act requires the Service to monitor the status and trends of fish, wildlife, and plants in each refuge and district.

A description of these and other laws and executive orders that may affect the CCP or the Service's implementation of the CCP is provided in appendix B. Service policies on planning and day-to-day management of refuges and districts are in the "Refuge System Manual" and "The Fish and Wildlife Service Manual."

## 1.4 District Contributions to National and Regional Plans

The resources and management activities of the Huron, Madison, and Sand Lake WMDs contribute to the conservation efforts described below.

### FULLFILLING THE PROMISE

A 1999 report, "Fulfilling the Promise, The National Wildlife Refuge System" (USFWS 1999), is the culmination of a yearlong process by teams of Service employees to evaluate the Refuge System nationwide. This report was the focus of the first National Refuge System conference (in 1998)—attended by refuge

managers, other Service employees, and representatives from leading conservation organizations.

The report contains 42 recommendations packaged with three vision statements addressing wildlife and habitat, people, and leadership. This CCP deals with all three major topics. The planning team looked to the recommendations in the document for guidance during CCP planning.

## **BIRD CONSERVATION**

During the past few decades, there has been growing interest in conserving birds and their habitats. This trend has led to the development of partnership-based bird conservation initiatives that have produced international, national, and regional conservation plans. “All-bird” conservation planning in North America is being achieved through the NABCI (North American Bird Conservation Initiative). Formed in 1999, the NABCI committee is a coalition of government agencies, private organizations, and bird initiatives in the United States working to advance integrated bird conservation based on sound science and cost-effective management to benefit all birds in all habitats. Conservation of all birds is being accomplished under four planning initiatives: The North American Landbird Conservation Plan (Partners in Flight), the U.S. Shorebird Conservation Plan, the North American Waterbird Conservation Plan, and the North American Waterfowl Management Plan.

## **PARTNERS IN FLIGHT**

The Partners in Flight program began in 1990 with the recognition of declining population levels of many migratory bird species. The challenge, according to the program, is managing human population growth while maintaining functional natural ecosystems. To meet this challenge, Partners in Flight worked to identify priority land bird species and habitat types. Partners in Flight activity has resulted in 52 bird conservation plans covering the continental United States.

The primary goal of Partners in Flight is to provide for the long-term health of the bird life of this continent. The first priority is to prevent the rarest species from going extinct. The second priority is to prevent uncommon species from descending into threatened status. The third priority is to “keep common birds common.”

For planning purposes, Partners in Flight splits North America into seven groupings of birds by ecological area—avifaunal biomes—and 37 BCRs (bird conservation regions) (figure 2). The three districts are within the “prairie avifaunal biome” in BCR 11, the Prairie Pothole Region. The westernmost portion of the Sand Lake WMD is within the “badlands and prairies avifaunal biome” in BCR 17.

BCR 11 is the most important waterfowl production area in the North America, despite extensive wetland

drainage and tillage of native grasslands. The density of breeding dabbling ducks commonly exceeds 100 pairs per square mile in some areas during years with favorable wetland conditions. The area comprises the core of the breeding range of most dabbling duck and several diving duck species. BCR 11 provides critical breeding and migration habitat for more than 200 other bird species, including such species of concern as Franklin’s gull and yellow rail, as well as piping plover, federally listed as threatened. In addition, Baird’s sparrow, Sprague’s pipit, chestnut-collared longspur, Wilson’s phalarope, marbled godwit, and American avocet are among the many priority nonwaterfowl species that breed in BCR 11. According to NABCI, wetland areas also provide key spring migration sites for Hudsonian godwit, American golden-plover, white-rumped sandpiper, and buff-breasted sandpiper.

Partners in Flight conservation priorities in the prairie avifaunal biome focus on protection of remaining prairies; management of existing grasslands using fire and grazing; and control of invasive plants, including woody plant encroachment.

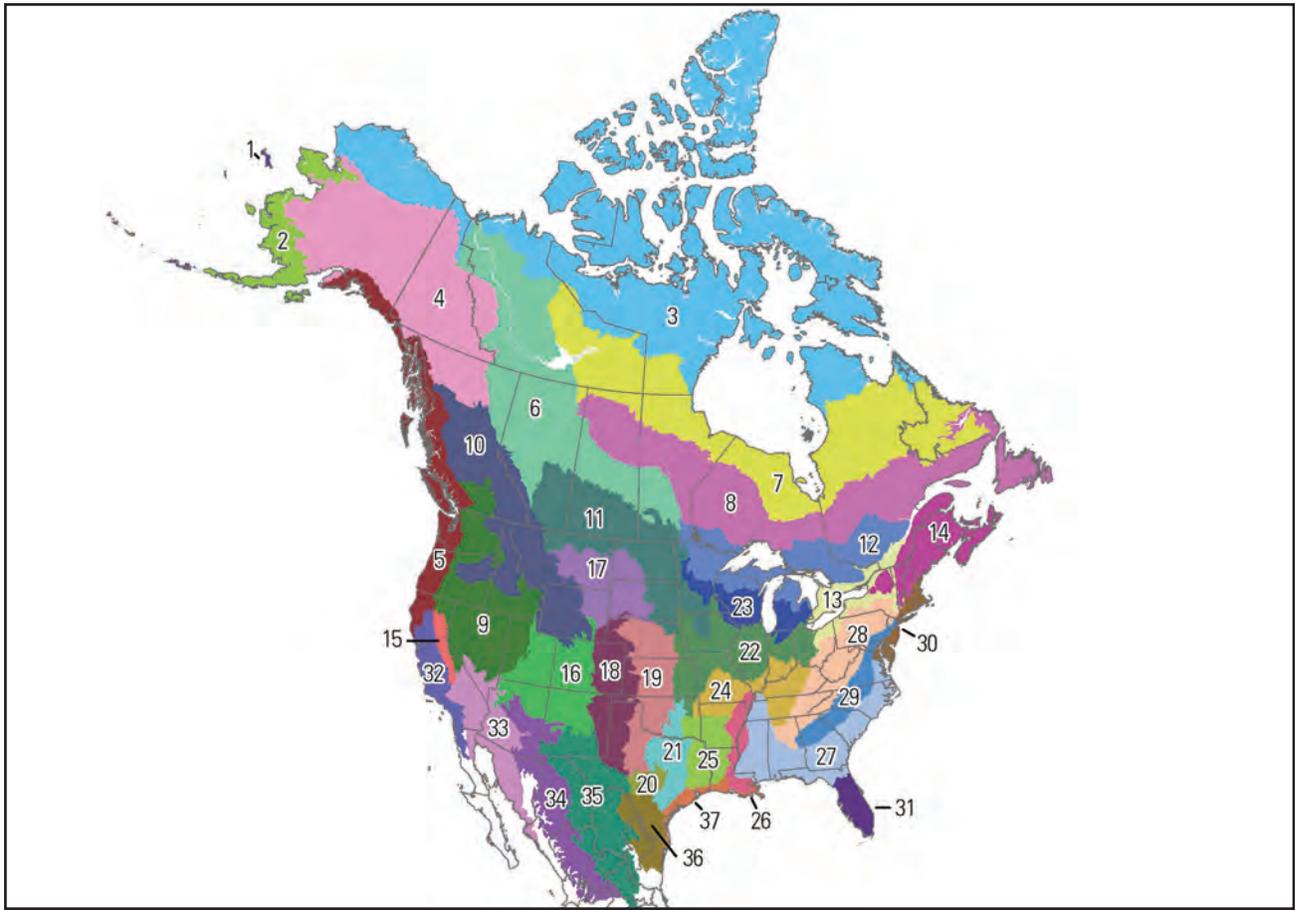
Region 17 is a semiarid plain dominated by mixed-grass prairie. Importantly, this region provides habitat for some of the healthiest populations of high-priority dry-grassland bird species on the continent, including mountain plover, McCown’s longspur, and long-billed curlew.

## **NORTH AMERICAN WATERFOWL MANAGEMENT PLAN**

By 1985, waterfowl populations had plummeted to record lows. Habitat that waterfowl depend on was disappearing at a rate of 60 acres per hour. Recognizing the importance of waterfowl and wetlands to North Americans and the need for international cooperation to help in the recovery of a shared resource, the United States and Canada governments developed a strategy to restore waterfowl populations through habitat protection, restoration, and enhancement. Written in 1986, the NAWMP (North American Waterfowl Management Plan) envisioned a 15-year effort to achieve landscape conditions that could sustain waterfowl populations. Specific NAWMP objectives are to increase and restore duck populations to the average levels of the 1970s—62 million breeding ducks and a fall flight of 100 million birds. Mexico became a signatory to the plan in 1994.

The plan is innovative because of its international scope and its regional-level implementation. Its success depends on the strength of partnerships called “joint ventures,” involving Federal, State, provincial, tribal, and local governments; businesses; conservation organizations; and individual citizens.

Joint ventures are regional, self-directed partnerships that carry out science-based conservation through a wide array of community participation.



**Figure 2. Map of the bird conservation regions of North America.**

Joint ventures develop implementation plans focusing on areas of concern identified in the plan. The three districts covered in this draft CCP lie within the area covered by the PPJV (Prairie Pothole Joint Venture).

The PPJV, which covers the Prairie Pothole Region of Iowa, Minnesota, Montana, North Dakota, and South Dakota, was established in 1987, and is one of the original six priority joint ventures under the NAWMP. The joint venture protects, restores, and enhances high-priority wetland and grassland habitat to help sustain populations of waterfowl, shorebirds, waterbirds, and prairie land birds. The PPJV encompasses one-third (100,000 square miles) of North America's Prairie Pothole Region. The remaining 200,000-square-mile portion is located in the Canadian provinces of Alberta, Manitoba, and Saskatchewan. This unique area contains millions of depressional wetlands (or potholes), making it one of the richest wetland systems in the world. These glacially formed prairie potholes and their surrounding grasslands are highly productive, supporting a stunning diversity of bird life.

### RECOVERY PLANS FOR FEDERALLY LISTED THREATENED OR ENDANGERED SPECIES

Where species that are federally listed threatened or endangered under ESA (Endangered Species Act)

occur in the three districts, the Service will follow the management goals and strategies in the species' recovery plans. The list of threatened or endangered species that occur at the districts will change as species are listed or delisted, or as listed species are discovered on district lands.

Currently, these three districts are following the recovery plans for these species:

- Piping plover (threatened) in the northern Great Plains (USFWS 1994a)
- Whooping crane (endangered) (USFWS 1994b)
- Interior least tern (endangered) (USFWS 1990)
- Western prairie fringed orchid (threatened) (USFWS 1996)

### STATE-LEVEL COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Over the past several decades, documented declines of wildlife populations have occurred nationwide. Congress created the SWG (State Wildlife Grant) program in 2001. This program provides Federal funds to States and territories to support conservation aimed at preventing wildlife from becoming endangered and in need of protection under ESA. The SWG program is an ambitious endeavor to take an active hand in

keeping species from becoming threatened or endangered in the future.

According to the SWG program, each State, territory, and the District of Columbia was required to complete a CWCS (comprehensive wildlife conservation strategy) by October 1, 2005, to receive future funding.

The strategies promulgated under the SWG program will help define an integrated approach to the stewardship of all wildlife species, with additional emphasis on species of concern and habitats at risk. The goal is to shift focus from single-species management and highly specialized individual efforts to a geographically based, landscape-oriented fish and wildlife conservation effort. The Service approves CWCSs and administers SWG program funding.

SDGFP's mission "... to perpetuate, conserve, manage, protect, and enhance South Dakota's wildlife resources, parks, and outdoor recreational opportunities" sets the framework for the State's actions.

SDGFP has opted to apply a *coarse filter/fine filter* strategy to its public land management needs. The plan emphasizes ecosystem diversity as the primary means to address habitat needs for biodiversity, with a secondary focus on non-habitat concerns regarding species of greatest conservation need. Program staff establishes a schedule for the development of recovery objectives for State-listed species. A threats assessment, identification of recovery goals, and species recovery actions provide a coordinated approach and give guidance for cooperating agencies to assist in recovery of these species. Management actions directed toward species are designed using an adaptive management framework.

South Dakota's list of "Species of Greatest Conservation Need" comprises 28 birds, 10 mammals, 7 freshwater mussels, 4 gastropods, 9 insects, 20 fishes, and 12 reptiles and amphibians. There are three primary criteria for inclusion in the list: State- and federally listed species for which the State has a mandate for recovery, species for which South Dakota represents a significant portion of the species' overall range, and species that are indicative of or depend upon a declining or unique habitat in South Dakota.

Three broad categories of human influence interfere with the maintenance of ecosystem diversity. These are direct alteration or conversion of species composition, structure, or function; indirect alteration or suppression of historical disturbance processes; and indirect alteration of species composition, structure, or function through the introduction and spread of nonnative species. Primary causative agents are agriculture and, to a lesser degree, urbanization. For riparian/wetland and aquatic ecosystems, additional causative agents include draining, surface water diversion, water impoundments, dams, ponds for water supply, and stream channelization.

The accidental or intentional introduction of invasive nonnative species can have major impacts on native species and ecosystems. Such introductions are of particular concern to maintaining the ecological integrity of historical ecosystems.

The loss or degradation of habitat as well as non-habitat-related impacts are areas of concern associated with the persistence of species in South Dakota. Loss or degradation of habitat is directly influenced by direct and indirect impacts on ecosystem diversity. Non-habitat-related impacts are typically characterized by direct human influences on a species' normal life cycle or existence.

The planning team reviewed South Dakota's CWCS and used the information during development of the draft CCP and EA. Implementation of the draft CCP's habitat goals and objectives would support the goals and objectives of the South Dakota conservation strategy.

## 1.5 Strategic Habitat Conservation

### A BROADER VISION

In the face of escalating challenges such as land use conversion, invasive species, water scarcity, and complex issues that have been amplified by accelerating climate change, the Service has evolved from its ecosystem approach to conservation toward developing a broader vision.

A cooperative effort by the Service and the USGS (U.S. Geological Survey) culminated in a report by the National Ecological Assessment Team (USGS 2006). The report outlines a unifying adaptive resource management approach for conservation at a landscape scale—the entire range of a priority species or suite of species. This is strategic habitat conservation—a way of thinking and doing business by incorporating biological goals for priority species populations, making strategic decisions about the work needed, and constantly reassessing.

Since 2006, the Service has taken significant steps to turn this vision into reality and has defined a framework of 22 geographic areas. Experts from the Service and USGS developed this framework through an aggregation of bird conservation regions (figure 2). The three South Dakota districts lie in the Plains and Prairie Potholes Geographic Area (figure 3). Key species and species groups targeted in this geographic area are paddlefish, pallid sturgeon, waterfowl, shorebirds, grassland birds, and black-footed ferret.

The Service is using the geographic framework as the basis to identify the first generation of landscape conservation cooperatives. These cooperatives are conservation-science partnerships between the

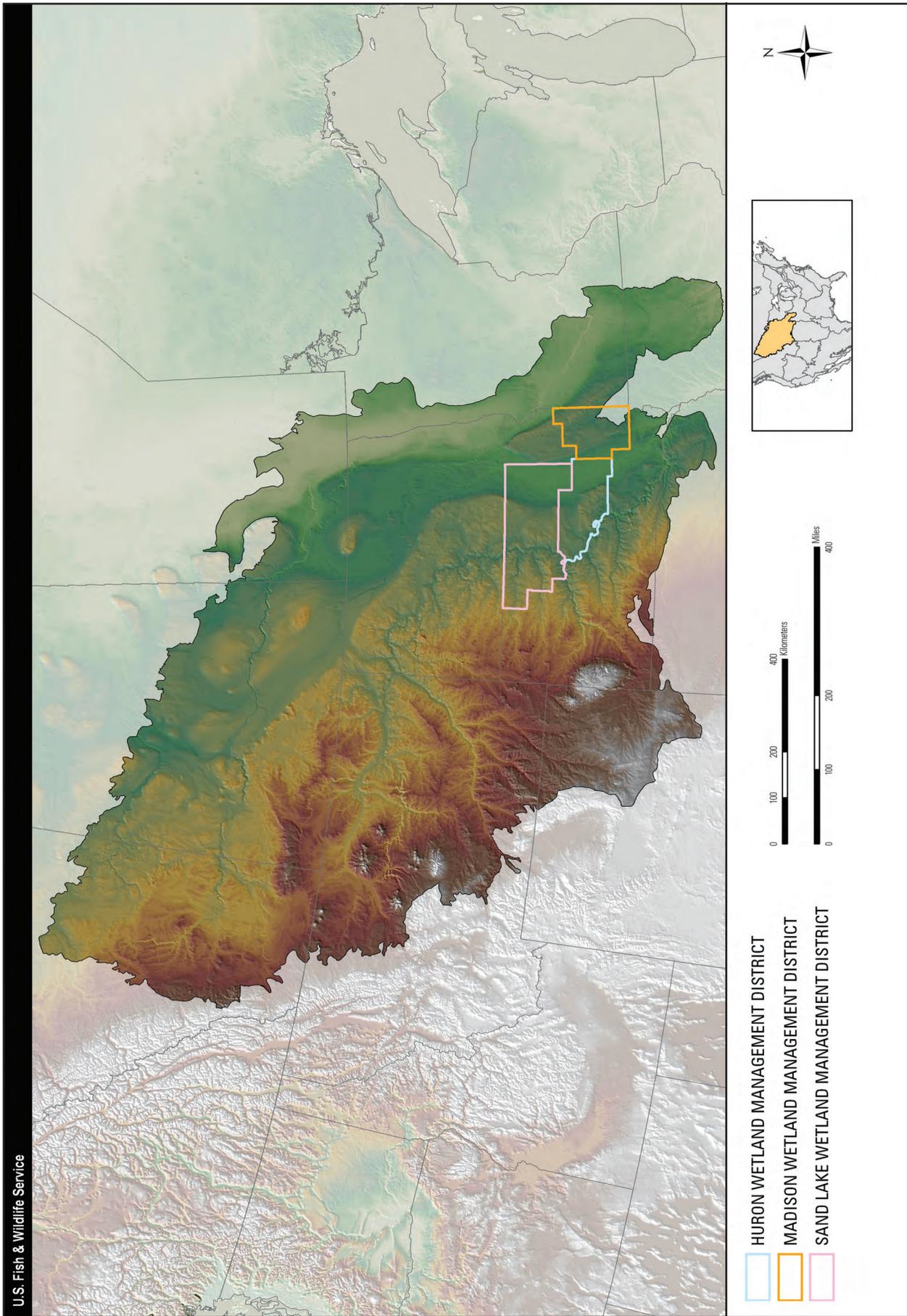


Figure 3. Map of the Plains and Prairie Potholes Geographic Area.

Service and other Federal agencies, States, tribes, NGOs (nongovernmental organizations), universities, and others. Designed as fundamental units for planning and science, the cooperatives have the capacity to help the Service carry out the elements of strategic habitat conservation—biological planning, conservation design and delivery, and monitoring and research. Coordinated planning and scientific information will strengthen the Service’s strategic response to accelerating climate change.

## CLIMATE CHANGE

The Service expects that accelerating climate change will affect the Nation’s fish, wildlife, and plant resources in profound ways. While many species will continue to thrive, some may decline and in some instances go extinct. Others will survive in the wild only through direct and continuous intervention by resource managers. In 2009, the Service drafted a strategic plan to address climate change for the next 50 years. The draft strategic plan employs three key strategies: adaptation, mitigation, and engagement. In addition, the plan acknowledges that no single organization or agency can address climate change without allying itself with others in partnerships across the Nation and around the world (USFWS 2010). This draft strategic plan is an integral part of the Department of the Interior’s strategy for addressing climate change as expressed in Secretarial Order 3289 (DOI 2009).

The Service will use the following guiding principles in responding to climate change (USFWS 2010):

- *Setting Priorities*—Continually evaluate priorities and approaches, make difficult choices, take calculated risks, and adapt to climate change.
- *Partnership*—Commit to a new spirit of coordination, collaboration, and interdependence with others.
- *Best Science*—Reflect scientific excellence, professionalism, and integrity in all the Service’s work.
- *Landscape Conservation*—Emphasize the conservation of habitats within sustainable landscapes, applying the Service’s strategic habitat conservation framework.
- *Technical Capacity*—Assemble and use state-of-the-art technical capacity to meet the climate change challenge.
- *Global Approach*—Be a leader in national and international efforts to meet the climate change challenge.

## 1.6 Planning Process

This draft CCP and EA for the three South Dakota districts is intended to comply with the Improvement Act, NEPA, and the implementing regulations of the acts. The Service issued its Refuge System planning policy in 2000. This policy established requirements and guidance for refuge and district plans—including CCPs and step-down management plans—to ensure that planning efforts comply with the Improvement Act. The planning policy identified several steps of the CCP and environmental analysis process (figure 4).

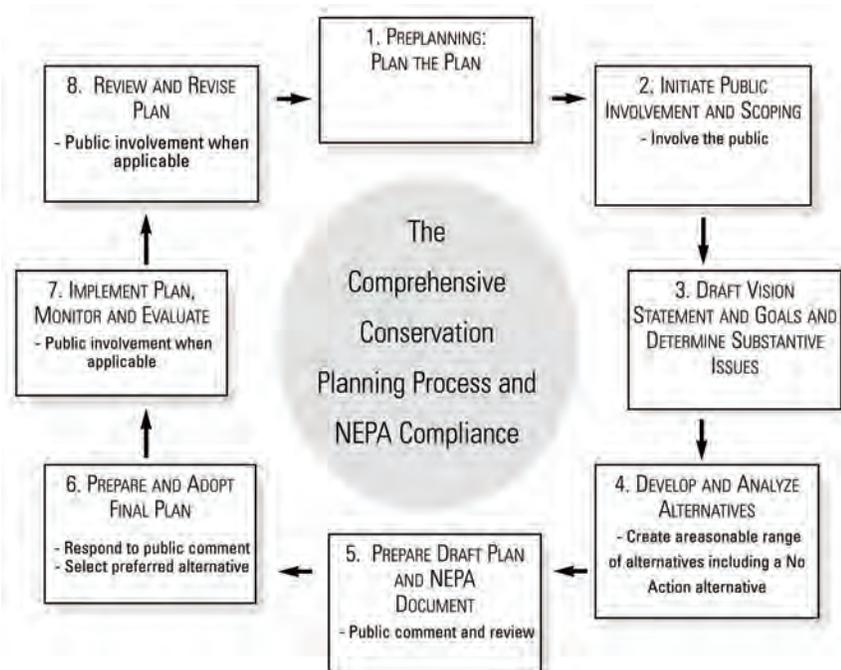


Figure 4. Steps in the planning process.

The Service began the pre-planning process in April 2008. The planning team consists of the project leaders of the three districts and many members of their staffs, as well as Regional Office personnel from the Divisions of Refuges and the Division of Realty (appendix C). During preplanning, the team developed a mailing list, internal issues, and a special qualities list. The planning team identified the status of current districts' programs, compiled and analyzed relevant data, and determined the purposes of the districts.

Table 1 summarizes the planning process to date.

## PUBLIC INVOLVEMENT

Scoping is the process of obtaining information from the public for input into the planning process.

Over the course of preplanning and scoping, the planning team collected available information about

the resources of the districts and the surrounding areas. Chapter 4 summarizes this information.

The draft CCP (chapter 6) outlines long-term guidance for management decisions, sets forth proposed objectives and strategies to accomplish refuge purposes and meet goals, and identifies the Service's best estimate of future needs.

The draft CCP details program levels that are sometimes substantially above current budget allocations and, as such, are primarily for Service strategic planning purposes.

A notice of intent to prepare the draft CCP and EA was published in the Federal Register in July 2008.

A mailing list of more than 600 names includes private citizens; local, regional, and State government representatives and legislators; other Federal agencies; and interested organizations (appendix D).

**Table 1. Planning process summary for the Huron, Madison, and Sand Lake WMDs CCP.**

<i>Date</i>	<i>Event</i>	<i>Outcome</i>
April 23, 2008	Pre-CCP kickoff conference call between planning team leader and project leaders and staffers of the three WMDs.	Planning team leader and district staff introduced. CCP/EA planning steps reviewed and clarified. Staff's CCP-related training ascertained. Dates and sites for public scoping meetings discussed.
May 2008	Identification of Native American tribes with possible aboriginal interests in the CCP planning area.	Comprehensive list of federally recognized Native American tribal government contacts to invite to CCP developed. Invitation letters to participate in planning process drafted. Invitation letters to CCP drafted, reviewed, and surnamed.
June 2008	Identification of SDGFP's conservation officers in the CCP planning area.	List of names of conservation officers to invite to participate in CCP process prepared. Invitation letter to the director of SDGFP to participate in CCP process drafted, reviewed, and surnamed.
June 24–27, 2008	Meet and greet site visit with CCP planning members at their field stations.	Traveled to all three district headquarters to meet informally with staffers to be part of the CCP planning team to answer CCP-related questions, decide on sites for public scoping meetings, and coordinate the development of CCP-related mailing list for entire planning area.
July 3, 2008	Mailing of invitation letters to the director of the SDGFP and Native American tribal governments with aboriginal interests in planning area to participate in CCP process.	Ensured coordination with and information of State and tribal conservation partners identified in Refuge Improvement Act. Extended invitation to be part of CCP planning team.
July 15, 2008	Kickoff meeting.	Planning team composition and roles determined; issues and qualities summarized; biological and mapping needs identified; responsibilities and schedule agreed upon; public scoping planned.
July 15–16, 2008	Purposes, vision, and goals workshop.	Districts' purposes revisited and understood. Vision statement and goals developed.
August 2008	Public scoping planning.	Scoping meeting schedules and formats finalized.
September 1, 2008	Planning update 1.	Planning update (describing CCP process), comment forms, announcing public scoping meetings, and postage-paid envelopes mailed.
September 8, 2008	Public Scoping meeting, Sioux Falls, South Dakota.	Public opportunity offered (to learn about the CCP and provide comments).

**Table 1. Planning process summary for the Huron, Madison, and Sand Lake WMDs CCP.**

<i>Date</i>	<i>Event</i>	<i>Outcome</i>
September 8, 2008	Public Scoping meeting, Columbia, South Dakota.	Public opportunity offered (to learn about the CCP and provide comments).
September 8, 2008	Public Scoping meeting, Highmore, South Dakota.	Public opportunity offered (to learn about the CCP and provide comments).
September 9, 2008	Public Scoping meeting, Roscoe, South Dakota.	Public opportunity offered (to learn about the CCP and provide comments).
September 10, 2008	Public Scoping meeting, Madison, South Dakota.	Public opportunity offered (to learn about the CCP and provide comments).
September 10, 2008	Public Scoping meeting, Huron, South Dakota.	Public opportunity offered (to learn about the CCP and provide comments).
September 11, 2008	Public Scoping meeting, DeSmet, South Dakota.	Public opportunity offered (to learn about the CCP and provide comments).
September 12–19, 2008	Public scoping comments.	All public comments to date compiled, summarized, and categorized to be addressed.
October 15–17, 2008	Alternatives and environmental consequences workshop.	Range of management alternatives drafted and a preferred one chosen based on careful analysis of its environmental consequences.
January 21–23, 2009	Objectives, strategies, and rationales workshop.	Objectives, strategies, and rationales for the proposed action begin to be drafted.
February 2009	Draft CCP and EA preparation.	First draft of the CCP and EA being prepared.
March–September 2009	Draft CCP and EA preparation temporarily halted.	Draft CCP and EA preparation halted due to planning team members participation in the emergency response to severe flooding event in the Dakotas and subsequent field season work.
September–December 2009	Draft CCP and EA data gathering continued.	Draft CCP and EA preparation continues with gathering of biological data in preparation of proposed prioritization system of management.
February–April 2010	Planning process on hold due to planning team members' participation in north-eastern South Dakota flooding containment events	Preparation of Draft CCP and EA temporarily stopped to deal with emergency situation.
July–December 2010	Draft CCP and EA data gathering continued.	Draft CCP and EA preparation continues with gathering of biological data in preparation of proposed prioritization system of management.
January–February 2011	Draft CCP and EA preparation and finalization.	Internal review draft CCP and EA preparation ends.
March 2011	Planning team reviews the draft CCP and EA.	First draft of the CCP and EA reviewed and commented on by planning team.
April 2011	Internal Service review of the draft CCP and EA.	Draft CCP and EA reviewed and commented on by the Service's regional office staff, planning team, and others.
May 2011	Preparation of Public Draft CCP and EA.	Planning team makes final edits to and prints draft CCP and EA for public distribution.
July 2011	Public review of and public meetings on draft CCP and EA.	Draft CCP and EA presented; public comments collected and compiled.
August 2011	Planning team review of public comments.	Public comments considered; changes recommended.
August 2011	Briefing of the Service's Regional Director.	Summary of public comments reviewed and addressed by the Service's Regional Director and deputy regional director.
August 2011	Editing of draft CCP/EA and preparation of final CCP.	Responses to public comments and necessary changes incorporated into the final CCP.
August 2011	CCP approval, publication, distribution, and implementation.	Final CCP approved by the Service's Regional Director and districts' staff begin implementing.

In September 2008, the first planning update was sent to everyone on the mailing list. Information was provided on the history of the districts and the CCP process, the draft vision and goals for the districts, and an invitation to and details of the eight public scoping meetings. Each planning update included a comment form and postage-paid envelope to give the public an opportunity to provide written comments.

The local media also announced the public meetings. The Service held eight public scoping meetings during four consecutive days. (See table 1 for details).

After a presentation about the districts, along with an overview of the CCP and NEPA process, attendees at the open house-style meetings were encouraged to ask questions and offer comments. Each attendee was given a comment form to submit additional thoughts or questions in writing.

All written comments were due by October 15, 2008. All comments received throughout the scoping process (obtained from meetings and correspondence, including emails) were considered in development of this draft CCP and EA.

### **STATE COORDINATION**

In July 2008, an invitation letter to participate in the CCP process was sent by the Service's Region 6 director to the director of SDGFP. Local SDGFP conservation officers and district staff maintain excellent and ongoing working relations that antedate the start of the CCP process.

SDGFP is responsible for managing natural resource lands owned by the State, in addition to enforcement responsibilities for the State's migratory birds and endangered species.

### **TRIBAL COORDINATION**

In June 2008, 14 Native American tribal governments were identified by the Service as having possible aboriginal interest in the planning area. In early July 2008, letters of invitation to participate in the CCP development process were signed by the Service's Region 6 director and sent to the Cheyenne River Sioux Tribe, the Crow Creek Sioux Tribe, the Flandreau Santee Sioux Tribe, the Fort Peck Assiniboine and Sioux Tribes, the Lower Brule Sioux Tribe, the Lower Sioux Indian Community, the Oglala Sioux Tribe, the Prairie Island Indian Community, the Rosebud Sioux

Tribe, the Santee Sioux Tribe, the Sisseton-Wahpeton Oyate Tribe, the Spirit Lake Tribe, the Standing Rock Sioux Tribe, and the Upper Sioux Community. With information about the upcoming CCP, the letter invited tribal recipients to serve on the planning team. The Service received two inquiries from among the 14 tribal governments identified and invited. After receiving clarification on the CCP, the chairs of these tribal governments wished to continue receiving correspondence, but felt the planning area would not be of interest to tribal members.

### **RESULTS OF SCOPING**

Comments collected from the scoping meetings and correspondence, including comment forms and emails, were used in the development of a final list of issues to be addressed in this draft CCP and EA.

The Service determined which alternatives could best address these issues. The planning process ensures that issues with the greatest effect on the districts are resolved or given priority over the life of the final CCP. Identified issues, along with a discussion of effects on resources, are summarized in chapter 2.

In addition, the Service considered suggested changes to current management of the districts presented by the public and other groups.

### **DECISION TO BE MADE**

The Service's Director of Region 6 will make the final decision on the selection of a preferred alternative for the CCP. The Regional Director's decision will be based on the legal responsibility of the Service and will consider the mission of the Service and the System, other legal and policy mandates, the purposes of the three districts, and the vision and goals in this draft CCP. In addition, the Regional Director will consider public input about the draft CCP and EA. Other considerations are land uses in the surrounding area and other parts of the ecosystem, the environmental effects of the alternatives, and future budget projections.

The Service's final decision will be documented in a finding of no significant impact that is published together with the final CCP and distributed to the public. The Service will begin to carry out the final CCP immediately on publication of the notice of availability of the final CCP in the Federal Register.



# CHAPTER 2— The Districts



*Wildlife protection is a priority of district management.*

Every unit of the Refuge System has a purpose for which it was established. This purpose is the foundation upon which all programs are built, from biology and public use to maintenance and facilities. No action that the Service or the public takes may conflict with this purpose. The goals, objectives, and strategies identified in this CCP are intended to support the purposes for which each district was established.

A wetland management district provides oversight for all of the Service's small land tracts in a multicounty area. The three districts manage 445 WPAs (100,094 acres) and more than 1 million acres of conservation easements in 25 counties in South Dakota. These district lands (totaling 1,136,965 acres) are part of the National Wildlife Refuge System, a network of lands set aside to conserve fish and wildlife and their habitat.

The Service purchases WPAs with funds generated from the sale of Federal Duck Stamps to protect and restore waterfowl habitat. These areas are managed primarily for the production of migratory birds. Conservation easements, also purchased using Duck Stamp funds, are on private lands where landowners have sold some of their property rights to the Service for protection and restoration of wildlife habitat.

This chapter describes the history, special values, purposes, vision, goals, and planning issues for the three South Dakota districts.

## 2.1 Establishment, Acquisition, and Management History

The Huron, Madison, and Sand Lake WMDs were established with the major objectives of wetland preservation, waterfowl and wildlife production, and maintenance of breeding grounds for migratory birds. The districts also provide a northern staging area and habitat for migration.

### HABITAT PROTECTION

The Service manages the WPAs for the benefit of waterfowl, other migratory birds, threatened and endangered species, and resident wildlife. The districts protect habitat primarily with two tools—WPAs and conservation easements—briefly described below.

- WPAs are public lands purchased by the Federal Government for increasing the production of migratory birds, especially waterfowl. The purchase of land is also known as “ownership in fee title,” where the Federal Government holds ownership of land on behalf of the American public. Money to buy WPA lands generally comes from the sale



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*Mallard drakes in flight.*

of Federal Duck Stamps. This important program was developed to ensure the long-term protection of waterfowl and other migratory bird breeding habitat, primarily in the Prairie Pothole Region of the northern Great Plains (figure 3). All WPAs are within districts managed by Service staff. WPAs are open to the public for hunting, fishing, bird watching, trapping, hiking, and most other non-motorized and noncommercial outdoor recreation. (Recreational trapping has been authorized by 50 CFR part 31.16.)

- Conservation easements are acquired to protect migratory bird species habitat on private land. Typically used where acquisition in fee title is not desirable or needed, perpetual easements are bought from willing landowners within a wetland management district. Conservation easements have several advantages over the outright purchase of lands by the Service. First, they are more cost effective in terms of both initial purchase and long-term management responsibilities. While conservation easement contracts do require attentive enforcement to ensure their integrity, they do not carry the other burdens of ownership—for example, maintenance of facilities such as fences and signs, control of invasive plants, and mowing of ditches. Second, the operator owns and manages the land in much the same way as was done before the conservation easement purchase. The program was developed and carried out by managers, biologists, and realty specialists with an interest in protecting resources at the landscape scale while minimally affecting, and even complementing, other agricultural practices. A single-habitat conservation easement is often referred to as either a “wetland easement” or a “grassland easement.” Wetland easements generally prohibit draining, burning, and leveling. Grassland easements generally prohibit the cultivation of grassland habitat, while still permitting the landowner traditional grazing uses.

The Service initially focused only on the protection of wetlands in the Prairie Pothole Region. However, data also revealed the importance of upland grasslands to successful nesting of waterfowl. With the continued conversion of grassland to cropland and consistent declines in the populations of grassland-dependent birds, the need to protect adjacent grassland habitats became evident. Like a wetland easement, a grassland easement transfers limited perpetual rights to the Service for a one-time, lump-sum payment. The purpose of a grassland easement is to prevent the conversion of grassland to cropland while minimally restricting existing agricultural practices. More specifically, the purposes of the grassland easement are to improve the water quality of wetlands by reducing soil erosion and the use of chemicals and fertilizers on surrounding uplands; to improve upland nesting habitat for all ground-nesting birds, especially waterfowl, and enhance nesting success on private lands; to perpetuate grassland cover established by other Federal programs (for example, the CRP [Conservation Reserve Program]); and to provide an alternative to the purchase of uplands in fee title, thus maintaining lands in private ownership. Grassland easements restrict the landowner from altering the grass by digging, plowing, disking, or otherwise destroying the vegetative cover. Haying, mowing, and seed harvest are restricted until July 16 of each year. The landowner can graze without restriction.

Wetland easements are administered similarly to grassland easements. These easements restrict the landowner from altering wetlands through draining, burning, or filling. When they are dry, the landowner can farm wetlands without restriction. Areas of wetland habitats supporting >25 duck pairs per square mile are eligible for the program.

The Federal Migratory Bird Conservation Fund finances the acquisition of WPAs and conservation easements by providing the Department (U.S. Department of Interior) with monies to acquire migratory bird habitat. The 1958 amendment to the Duck Stamp Act (Migratory Bird Hunting and Conservation Stamp Act [16 United States Code (U.S.C.) 718]) authorized the Small Wetlands Acquisition Program and provided for the acquisition of WPAs in addition to the previously authorized habitats. Receipts from the sale of Duck Stamps are used to acquire habitat under the provisions of the Migratory Bird Treaty Act (16 U.S.C. 715). The Service’s perpetual conservation easements are key components of the Small Wetlands Acquisition Program; these easements, together with WPAs, have contributed greatly to the conservation and maintenance of prairie-nesting migratory birds.

The districts administer other conservation easements that were not acquired through the Small Wetlands Acquisition Program. The most common of these are Farmers Home Administration conservation

**Table 2. Grassland and wetland easements in the three districts.**

<i>District</i>	<i>County</i>	<i>Purchase date</i>	<i>Tract</i>	<i>Number of acres</i>	<i>Number of tracts</i>	<i>Total acres</i>
<b>First Grassland Easement Purchase</b>						
Huron	Sanborn	12/05/1990	188G	529.00	455	141,944.89
Madison	McCook	12/30/1991	191G	129.20	243	53,612.46
Sand Lake	Walworth	06/22/1990	83G	436.00	905	332,314.83
Total					1,603	527,872.18
<b>First Wetland Easement Purchase</b>						
Huron	Hand	10/09/1963	11X	29.00	1,424	85,579.90
Madison	Deuel	01/18/1963	10X	31.00	1,573	55,218.10
Sand Lake	McPherson	07/20/1962	12X	242.00	3,497	231,761.16
Total					6,494	372,559.16

easements—also known as Rural Economic and Community Development easements, Farm Service Agency “Ag-Credit easements,” and USDA (U.S. Department of Agriculture) conservation easements, depending on the status of the USDA program responsible for these properties at the time they were in Federal inventory. The 1985 Farm Bill Consolidated Farm and Rural Development Act was the initial authorization for Farmers Home Administration easements. The Farmers Home Administration was given authority to establish easements for conservation, recreation, and wildlife purposes on properties that were foreclosed on by the Federal Government (“inventory” properties), and the Service was designated easement manager for those easements worthy of inclusion into the System.

## DISTRICT DESCRIPTIONS

The three districts support all the waterfowl species that occur in the Prairie Pothole Region. The three districts manage more than 1.5 million acres within the 27-county planning area in South Dakota (for an accurate breakdown of these acres please see “Service Activities in South Dakota” in chapter 1). Each of the three districts is described below.

### HURON WMD

The Huron WMD was established in 1992. The district was established encompassing lands that were previously under the management of both the Lake Andes and Sand Lake WMDs. This area was too far from the previous management offices to afford reliable and efficient management, resulting in minimal management of lands acquired prior to district establishment.

Huron WMD encompasses eight counties—Beadle, Buffalo, Hand, Hughes, Hyde, Jerauld, Sanborn, and Sully—in east-central South Dakota, an area of approximately 6,869 square miles. In 2010, the district administered 62 WPAs totaling approximately 17,574 acres, wetland easements totaling approximately 86,333 acres, grassland easements totaling approximately

145,205 acres, and conservation easements totaling approximately 10,100 acres (figure 5). Although at least one WPA is located in every county, the majority are currently in Beadle, Hand, and Jerauld Counties.

Important features of Huron WMD include the following:

- The district contains the smallest number of fee-title acres. Due to the smaller size of this district, staff has the ability to manage and monitor intensively.
- The district is subject to the most rapid agricultural growth and development of the three districts; this growth is expected to continue.
- The district presents opportunities to increase easement acres—meaning an opportunity to protect more native prairie.
- Management focuses on restoration of native prairie with fire and grazing.
- The Huron WMD is one of only three districts with an active Friends Group.

Issues faced by Huron WMD include the following:

- The location is challenging. Many hours of travel are required to manage and monitor district lands.
- Significant conversion of grasslands to agriculture continues within the district.

### MADISON WMD

The Madison WMD was established in 1969. It evolved from the withdrawal of four counties from Waubay WMD and five counties from Lake Andes WMD. Deuel, Brookings, Hamlin, Kingsbury, Miner, Moody, McCook, Lake, and Minnehaha Counties are included within the district, covering an area of 5,804 square miles. Minnehaha is the largest South Dakota county by population, with 148,281 inhabitants. The district extends west from the Minnesota border through the Big Sioux Basin and Prairie Coteau ecoregions (see discussion in chapter 4). Tallgrass prairie and agricultural lands comprise most of the district. As of January 2010, the Madison WMD administered 221 WPAs totaling

approximately 38,778 acres, wetland easements totaling approximately 57,074 acres, grassland easements totaling approximately 72,263 acres, tallgrass prairie easements totaling approximately 11,006 acres, and Farmers Home Administration easements totaling approximately 6,500 acres (figure 6).

Important characteristics of Madison WMD include the following:

- The district consists primarily of tallgrass prairie (with some mixed-grass prairie). The district contains Prairie Coteau, James River Lowland, Big Sioux Basin, and Loess Prairies.
- The district has the largest human population of the three South Dakota districts.
- The district is home to many lakes and semipermanent or permanent wetlands.
- The district contains the least amount of native prairie of the three districts.
- Such notables as early pioneer artist Harvey Dunn and author Laura Ingalls Wilder of “Little House on the Prairie” are from this area. Wilder’s book, “On the Shores of Silver Lake,” was written about her childhood memories of life next to a beautiful prairie wetland that still attracts many visitors each year.

Issues faced by Madison WMD include the following:

- The largest human population leads to issues with encroaching urban development.
- More lakes mean more people—meaning more jet skis and more wildlife disturbance.
- Wetland drainage issues require more enforcement. Wetlands may be wet only about 50 percent of the time; people want to drain wetlands so that they can produce crops.
- There is extensive agricultural tillage; native grass is diminishing at an alarming rate.

## SAND LAKE WMD

The Sand Lake WMD was established in 1961. The largest district in the country, it originally encompassed 11 counties—Brown, Spink, McPherson, Edmunds, Faulk, Campbell, Walworth, Potter, Corson, Dewey, and Sully—in north-central South Dakota, covering an area of approximately 12,000 square miles. In 1992, Sully County was transferred to the newly established Huron WMD. The current 10-county district extends west to the Missouri River and includes part of the James River Basin to the east. The western portion of the district is characterized by mixed-grass prairie. Transition prairie and agricultural lands characterize the eastern portion. In 2010, the district administered 162 WPAs totaling approximately 43,742 acres, wetland easements totaling approximately 234,986 acres, grassland easements totaling approximately 398,589 acres, and conservation easements totaling approximately 14,815 acres (figure 7).

Important characteristics of Sand Lake WMD include the following:

- The district extends from James River Lowland in the southeastern corner to the Missouri Plateau in the northwestern corner, with most of its fee title and easement lands in the Missouri Coteau and Drift Plains.
- The district straddles the Missouri River and includes some easements west of the Missouri River.
- Wetland drainage and tiling are not as great an issue as in other districts.

Issues faced by Sand Lake WMD include the following:

- Although the district is a huge entity, it operates in the shadow of Sand Lake National Wildlife Refuge. District staff is shared with the refuge. The staff is mostly focused on the refuge, not the district.
- Headquarters are at the Sand Lake refuge. This location is not ideal, because it is far from the majority of landholdings.
- The district has substantial noxious weed problems.
- Tillage is occurring at an accelerated rate.

## 2.2 Special Values

Early in the planning process, the planning team and public identified the outstanding qualities of the three districts. District qualities are the characteristics and features of each district that make it special, valuable for wildlife, and worthy of inclusion in the System. It was important to identify the special values of each district to recognize its worth and to ensure that the special values of the districts are preserved, protected, and enhanced through the planning process. District qualities can be distinct and important biological values, as well as simple values such as providing a quiet place to see a variety of birds and enjoy nature.

The following summarizes the qualities that make the districts unique and valued:

- The districts have a very high density of wetlands to support waterfowl and migratory birds.
- Very large blocks of intact native prairie ecosystem are protected through the districts’ conservation easements and fee-title ownership.
- The districts provide protected and managed wetlands and uplands for breeding and staging habitat for waterfowl and shorebirds during migration along the central flyway.
- The districts provide diverse and abundant possibilities for public use.
- The districts provide for quality environmental education.

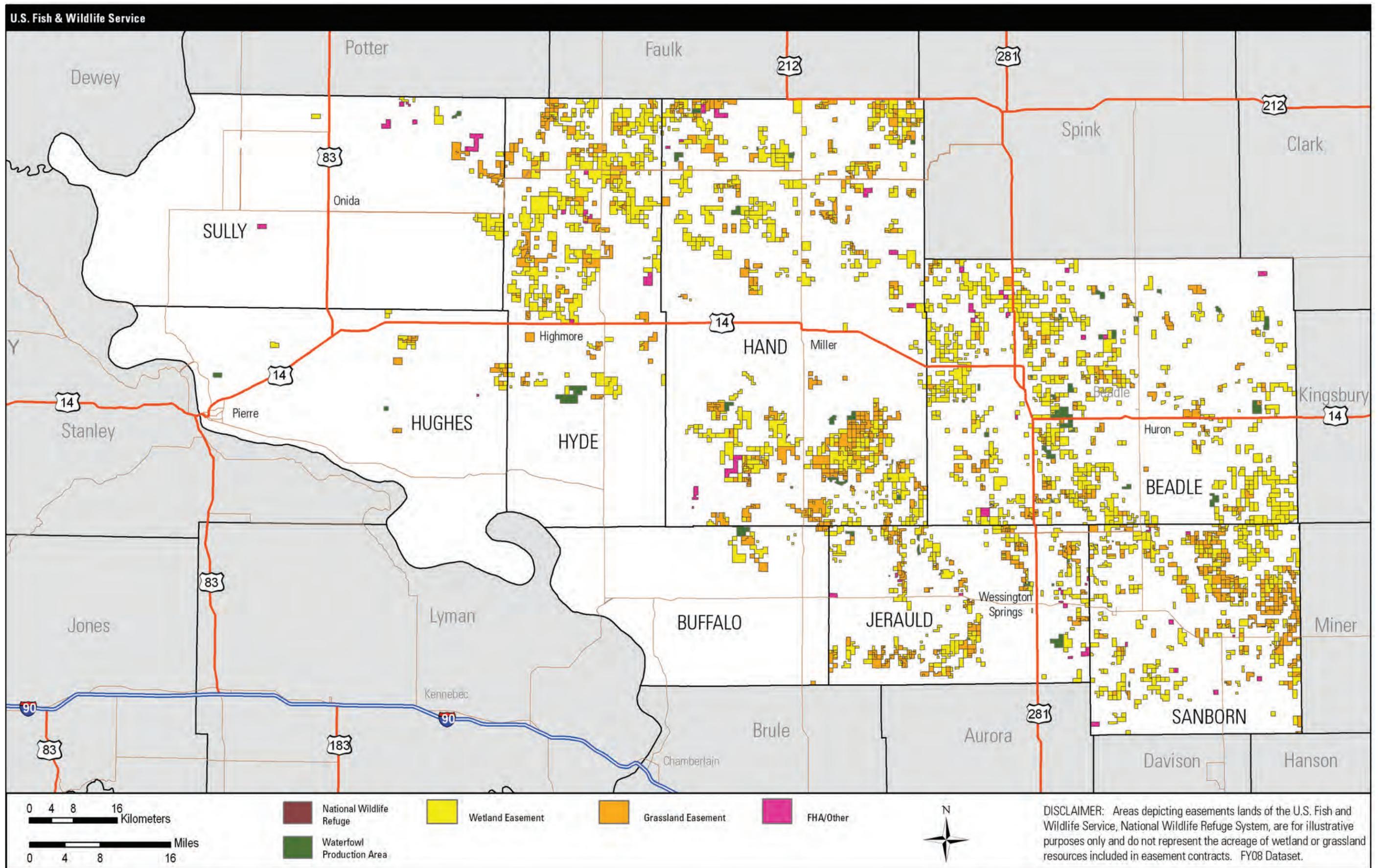


Figure 5. Service-managed lands in the Huron WMD.

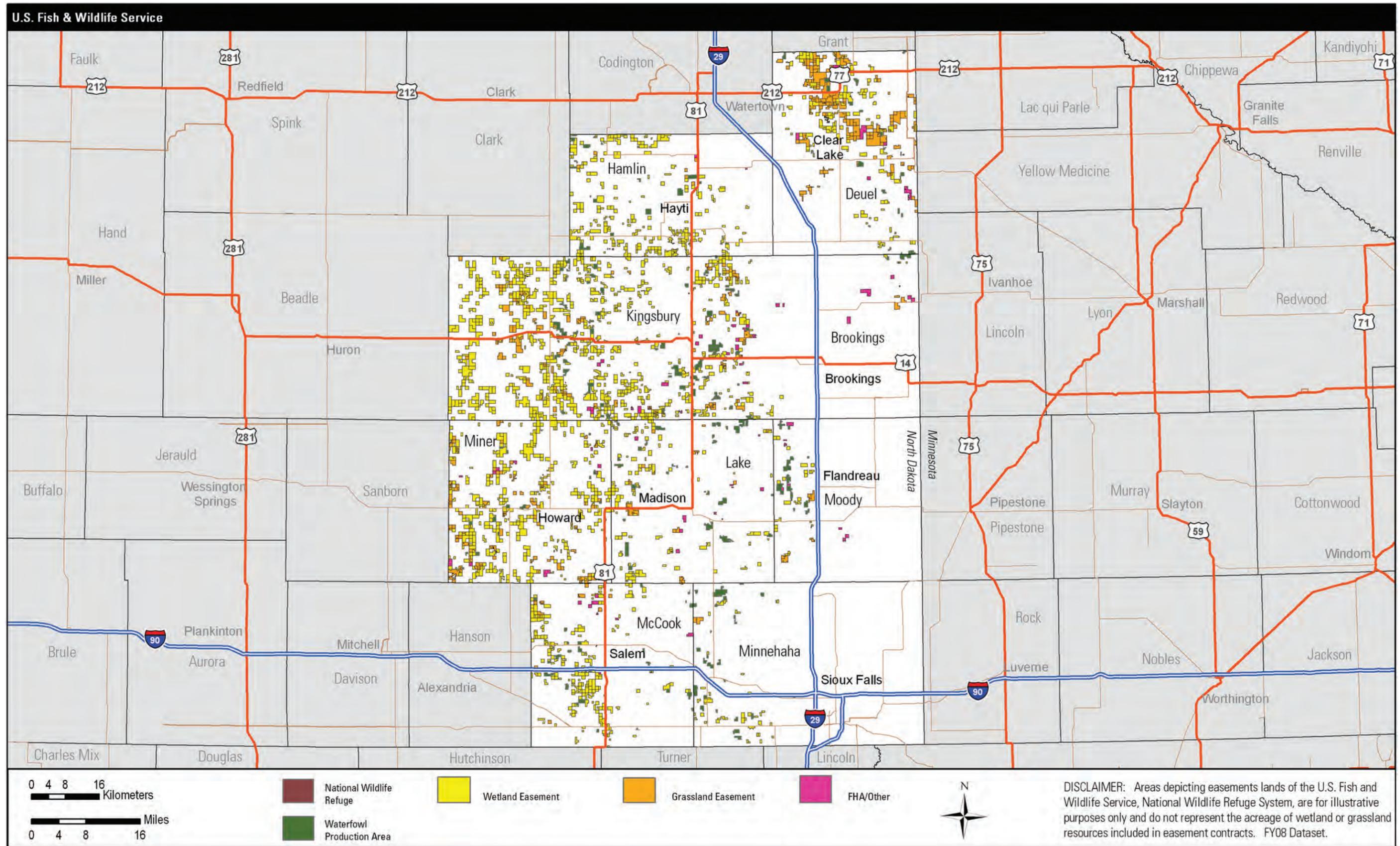


Figure 6. Service-managed lands in the Madison WMD.

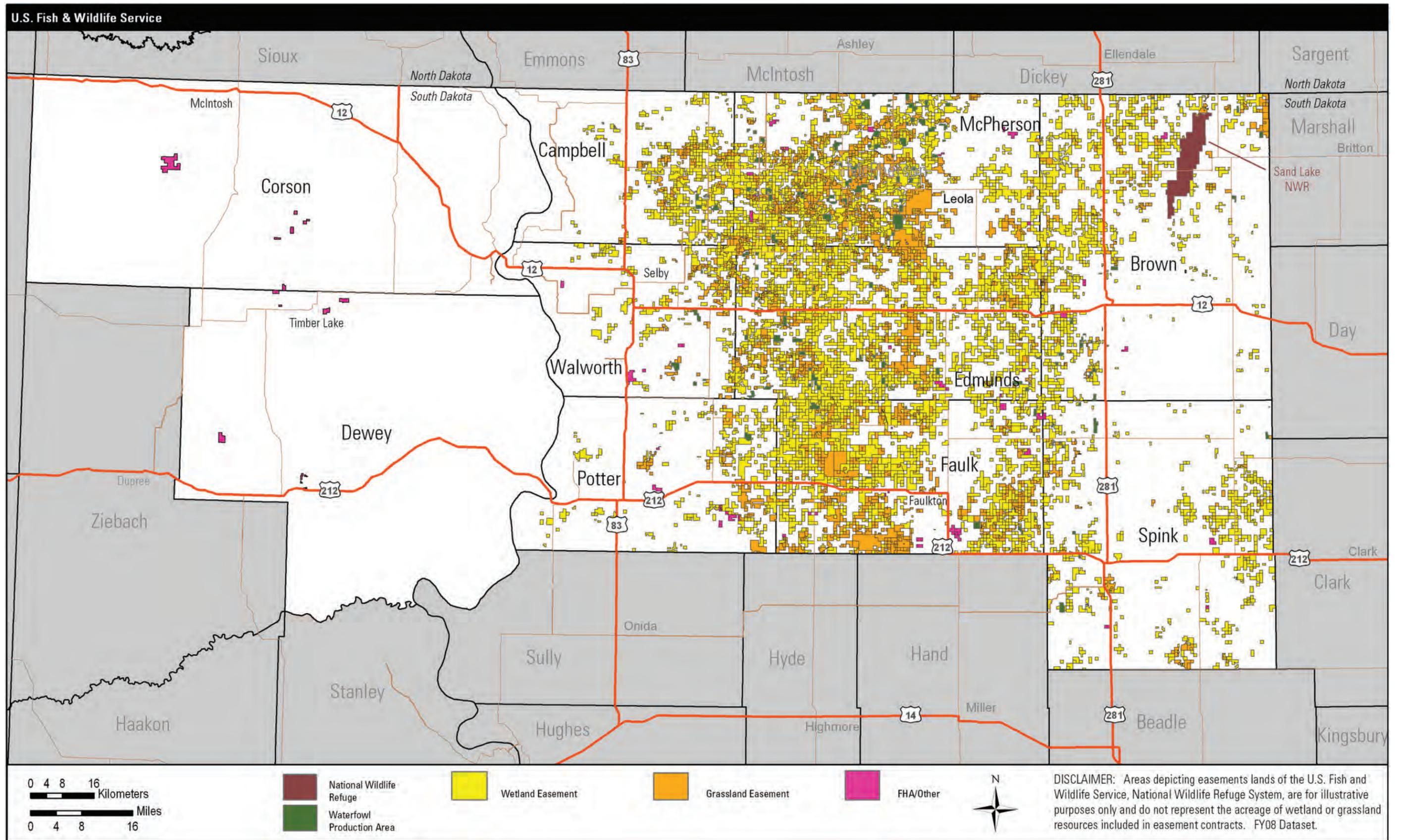


Figure 7. Service-managed lands in the Sand Lake WMD.



## 2.3 Purposes

The districts were created to administer the Small Wetlands Acquisition Program to save wetlands from various threats—particularly drainage. By 1991, grassland easements were also being protected under this program. The main authorities in establishment of the program are briefly discussed below:

- Migratory Bird Hunting and Conservation Stamp Act (16 U.S.C. 718d[c])—“as waterfowl production areas subject to all provisions of the Migratory Bird Conservation Act ... except the inviolate sanctuary provisions.” The Duck Stamp Act provides for the conservation, protection, and propagation of native species of fish and wildlife, including migratory birds that are threatened with extinction.
- Migratory Bird Conservation Act (16 U.S.C. 715d[2])—“for any other management purposes, for migratory birds.” This act addresses the obligations of the United States under the Migratory Bird Treaty Act through the following mechanisms:
  - Lessening the dangers threatening migratory game birds from drainage and other causes.
  - The acquisition of areas of land and water to furnish in perpetuity reservations for the adequate protection of such birds.
  - Authorizing appropriations for the establishment of such areas, their maintenance and improvement, and for other purposes.



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*Western meadowlark singing.*

The purpose of the districts is “to assure the long-term viability of the breeding waterfowl population and production through the acquisition and management of waterfowl production areas, while considering the needs of other migratory birds, threatened and endangered species, and other wildlife” (memorandum from Region 6 Assistant Regional Director Richard A. Coleman, December 2006). This purpose statement was developed for all Region 6 wetland management districts. Because the purposes and management capabilities and challenges are similar for the three districts, the Service has elected to address them collectively in this draft CCP and EA.

## 2.4 Vision

At the beginning of the planning process, the Service developed a vision for the three districts. The vision is a concept that describes the essence of what the Service is trying to accomplish in the three districts. It is a future-oriented statement intended to be realized by the end of the 15-year CCP planning horizon.

*Clear blue skies frame spectacular views of grasslands and wetlands teeming with migratory waterfowl and other wildlife in the Huron, Madison, and Sand Lake Wetland Management Districts. Here, future generations will experience the whistle of the northern pintail, the song of the western meadowlark, and the distant boom of the prairie chicken. Located in the Prairie Pothole Region of South Dakota, these districts preserve timeless landscapes in the face of change. Conservation of these lands is achieved through hard work and the support of friends and neighbors who value natural places as an essential component of their quality of life.*

## 2.5 Goals

The following goals have been developed to guide management decisions as they pertain to natural communities, uses, and management activities.

### NATIVE PRAIRIE

Conserve, restore, and improve the biological integrity and ecological function of the native prairies to support

healthy populations of native plants and wildlife and promote the natural role of fire and grazing in shaping and managing these landscapes.

### **PLANTED GRASSLANDS**

Manage planted grasslands to contribute to the production and growth of continental waterfowl populations, other migratory birds, threatened and endangered species, and other wildlife.

### **WETLANDS**

Protect, restore, and enhance prairie pothole wetlands to support diverse plant communities and provide habitat to waterfowl, shorebirds, wading birds, and associated wetland-dependent wildlife.

### **RESEARCH AND MONITORING**

Provide a learning platform that uses science, monitoring, applied research, and adaptive management to advance understanding of the Prairie Pothole Region and management of these areas.

### **CONSUMPTIVE USES**

Provide visitors with quality opportunities to enjoy hunting, fishing, and trapping in waterfowl production areas and expand their knowledge and appreciation of the prairie landscape and the National Wildlife Refuge System.

### **NONCONSUMPTIVE USES**

Provide visitors with quality opportunities to enjoy, observe, photograph, and appreciate the prairie ecosystem while expanding their knowledge of and support for the National Wildlife Refuge System.

### **OPERATIONS AND ADMINISTRATION**

Through effective communication and innovative partnerships, secure and efficiently utilize funding, staffing, and volunteer programs for the benefit of all natural resources in the districts.

### **PARTNERSHIPS**

Promote and develop partnerships with landowners, public and private organizations, and other interested individuals to maintain, restore, and enhance a diverse and productive landscape in the Prairie Pothole Region.

### **ENVIRONMENTAL EDUCATION AND INTERPRETATION**

Provide quality educational opportunities for persons of all abilities to learn about, understand, and appreciate prairie landscapes and the role of the National Wildlife Refuge System.

## **2.6 Planning Issues**

Several key issues were identified through the analysis of comments collected from Service staff and the public and a review of the requirements of the Improvement Act and NEPA. Substantive comments (those that could be addressed within the authority and management capabilities of the Service) were considered during the formulation of the alternatives for future management. Summaries of these key issues are below.

### **WETLAND AND UPLAND HABITATS**

All three districts have a primary purpose to provide optimal habitat conditions for the needs of a suite of waterfowl and other migratory birds and, to a lesser extent, native resident wildlife. Aggressive management of wetland and upland habitats must be conducted to achieve goals and objectives. Wetland and upland habitats need to be protected and enhanced through management. Habitat protection needs to be evaluated through a system of prioritization so that different approaches to protection—either fee-title acquisition or conservation easement—can be evaluated.

### **INVASIVE PLANTS**

The districts include uplands that were previously farmed. Farmed uplands have since been restored to mixes of tame and native grasses. These areas are interspersed with native uplands, the bulk of which are largely dominated by native vegetation character



Bridgette Flanders-Wanner/USFWS

*Biologist Shilo Comeau on a wetland field visit.*

but are compromised by invading species. The primary invasive forbs are leafy spurge, Canada thistle, sow thistle, and absinth wormwood. Smooth brome, Kentucky bluegrass, and crested wheatgrass are primary invasive grass species. These nonnative forbs and grasses substantially degrade the quality and suitability of upland habitat for many native wildlife species.

### ENERGY DEVELOPMENT

While the Service works to minimize the negative effects of energy development, the demand for energy is an increasing factor in habitat quality and preservation in the districts. The production of biofuels and wind energy has the potential to impact the effectiveness of many district programs. The Service supports research that helps to understand the effects on wildlife of renewable energy projects such as wind farms and the conversion of grassland to cropland for ethanol production. For example, the effects of wind turbines on birds remains a challenging matter to investigate. Through studies and analysis, the Service is currently evaluating wind turbines to determine their effects on wildlife. In addition, it is unknown if wind power will affect the potential for future habitat protection through conservation easements.

### PRAIRIE CONVERSION

Native prairie is suffering conversion to other uses at an alarming rate. Prairie is being converted for crop production, creating additional demand for irrigation water. Conservation groups should assume an active role, in partnership with the agricultural community, to protect the Federal Farm Bill and its conservation provisions, such as the CRP and the “Swampbuster” and “Sod Saver” provisions in the 1985 Farm Bill (amended 1990, 1996, 2002).



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*Red foxes thrive in human-influenced environments.*

### PREDATOR MANAGEMENT

Several species—particularly red fox, coyote, striped skunk, Franklin’s ground squirrel, mink, badger, and raccoon—occur at higher than historical levels due to modifications of habitat and other factors. These species can adversely affect—primarily by predation on nests of grassland-nesting bird species—waterfowl and other migratory bird populations. Such predation reduces the likelihood that the Service can attain wildlife population goals and objectives for the districts. Woody vegetation has a negative influence on grassland songbirds because it provides habitat for predators and attracts forest-edge bird species that may displace grassland species.

### VISITOR SERVICES

Hunting, fishing, wildlife observation and photography, and environmental education and interpretation are uses currently authorized on lands administered



Bridgette Flanders-Wanner/USFWS

*District lands serve multiple purposes.*

by the districts. A growing demand for public recreation in South Dakota and the nation makes these six wildlife-dependent recreational uses, as specified in the Improvement Act, an issue of primary interest.

### **PARTNERSHIPS**

The Service puts a high priority on working in partnership with conservation and agricultural groups to support conservation programs such as Federal Farm Bill legislation, SDGFP projects, water quality and watershed projects, and private conservation efforts.

### **OPERATIONS**

Funding and staff are not sufficient to fulfill the purposes and meet the goals of the districts. Identification of priorities and efficient direction of resources will always be an issue for the districts. The Service's staff needs to identify and describe unfunded needs

to be able to compete effectively for additional money from within the Service as well as from partners and other sources. District facilities need to be evaluated and upgraded.

### **MONITORING AND RESEARCH**

Monitoring habitat and wildlife populations is an essential element in achieving the districts' primary goals and objectives. Basic data about recruitment, mortality, and habitat use for a representative group of species must be collected and analyzed on a regular basis to make appropriate decisions for maintaining the viability of the habitats on which these species depend. Using the districts for field research could contribute valuable strides in development of new directions in management and expansion of the knowledge of field biologists.

# CHAPTER 3— Alternatives



*Expansive grasslands characterize the districts.*

Alternatives are different approaches to the management of the districts designed to resolve issues; achieve the district's purpose, vision, and goals as identified in the CCP; and help fulfill the System's mission and comply with current laws, regulations, and policies. NEPA requires an equal and full analysis of all alternatives considered for implementation.

This chapter describes three management alternatives for the districts: alternative A, Current Management (no action); alternative B, Increased Efficiency (Proposed Action); and alternative C, Increased Efficiency with Expanded Resources.

This CCP and EA have been developed at the programmatic level rather than as a management plan for each district. This was the most logical approach given the following circumstances:

- Three wetland management districts addressed in the CCP.
- All three districts involve a mixture of fee and easement authorities.
- There is a similar purpose, vision, and goal for each district.
- All three districts are located in central and eastern South Dakota.

## 3.1 Alternatives Development

Alternatives are formulated to address the significant issues identified by the Service, the public, and the governmental partners during the internal and public scoping process and throughout the development of the draft plan.

This chapter contains the following sections:

- Elements Common to All Alternatives
- Description of Alternatives
- Comparison of Alternatives (table 3)

This chapter describes three management alternatives that represent different approaches to enhancing the protection and restoration of fish, wildlife, plants, habitats, and other resources. Alternative A, Current Management, describes ongoing district management. The no-action alternative is a basis for comparison with alternatives B and C. Alternative B is the Service's proposed action and basis for the draft CCP (chapter 6).

The planning team assessed biological conditions and external relationships affecting the districts. This information contributed to the development of alternatives, each of which presents a distinct approach for addressing long-term goals. Each alternative was evaluated on the basis of its expected success in



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*A Canada goose wings overhead.*

meeting the vision and goals of the districts and how it would address core wildlife and habitat issues and threats. Where data are available, trends in habitat and wildlife are evaluated, and the environmental consequences of each alternative are projected.

## 3.2 Elements Common to All Alternatives

A number of elements are common to all three alternatives. The need to maintain suitable habitat for a wide range of migratory bird species, especially those species of management concern, is an overriding concern regardless of the alternative selected.

Management of upland habitats includes the potential use of an array of practices (fire, grazing, chemicals, and biological control) under all alternatives. Similarly, management of disturbed uplands (specifically, lands that have been or are currently being cropped, farmed, broken, or seeded to a native or tamegrass mixture) focuses on improved habitat quality for migratory birds.

Public use and education, such as workshops and enhanced outreach, will be provided to area schools and the general public to the fullest extent possible. Maintaining support for hunting, fishing, wildlife observation and photography, and environmental education and interpretation are common to all three alternatives.

All three alternatives promote, at a minimum, the opportunistic identification, documentation, and protection of the district's cultural resources. All district activities are coordinated through Service Cultural Resources Specialists.

The research and monitoring efforts under all alternatives would focus on improving the Service's knowledge of how best to control invasive nonnative flora, and would increase the intensity and extent of upland and wetland vegetation monitoring.

## 3.3 Description of Alternatives

Management actions to advance the System's mission and the purpose and vision of the three districts under each of the alternatives are summarized below. The alternatives reflect options to address significant threats, problems, and issues raised by public agencies, private citizens, and interested organizations.

Each alternative differs in its ability to achieve long-term wildlife and habitat goals. However, each is similar in its approach to managing the districts. Each alternative would:

- pursue the goals outlined in chapter 2
- protect and enhance a diverse assemblage of habitats
- be consistent with the purpose of the districts and with the System mission and goals

The focus and actions for each of alternatives A–C are described below.

### ALTERNATIVE A—CURRENT MANAGEMENT (NO ACTION)

#### Summary

Under alternative A, management activities currently conducted by the Service throughout all three districts would not change. The no-action alternative provides the baseline against which to compare other alternatives. It is also a requirement of NEPA that a no-action alternative be addressed in the planning process. The Service would not develop any new management, restoration, education, or visitor services programs for the districts. Staff would not expand or change current habitat and wildlife management practices conducted for the benefit of waterfowl, State- and federally listed species, migratory birds, and other native wildlife. Staff would conduct monitoring, inventory, and research activities at their current level (that is, limited, issue-driven research and limited avian and vegetative monitoring and inventory). Funding and staff levels would not change, and programs would follow the same direction, emphasis, and intensity as they do at present.

#### Habitat and Wildlife

The current management of wildlife habitat and associated species on district WPAs are prioritized (according to similar but distinct methodologies between districts) into high, medium, and low areas. In general, only high-priority WPAs currently receive consistent management.

All conservation easements are monitored by Service personnel; however, only the high-priority easement violations are consistently enforced.

Acquisition efforts by the Division of Realty are focused on high-priority tracts; most of these efforts entail securing easements from willing private landowners.

A concerted effort is made to control plant species that are recognized by the State and county as invasive. Habitat management on high-priority WPAs is directed to address invasive species of serious ecological concern.

Active burning, grazing, farming, and invasive species control programs are used to maintain and/or improve native prairie and planted grassland units.

District staff would continue to monitor energy development and evaluate road and pad development on a case-by-case basis. Staff would continue to monitor for contaminant spills and will direct cleanup by power companies.

Under this alternative, district staff would continue to monitor and document the presence and use of district lands by federally listed species, such as piping plover and whooping crane. District staff would continue to impose area closures to public use to protect federally listed species using district lands, especially during nesting season.

### **Monitoring and Research**

The current wildlife and habitat monitoring efforts on the lands managed by all three districts would continue. These efforts include annual surveys of various bird groups (such as breeding waterfowl and migrant shorebirds) on certain Service lands, and periodic monitoring of waterfowl and colonial waterbird nesting efforts and success on certain Service lands. Monitoring and inventory of projects related to the flora of district lands (for example, belt transect monitoring of management effects) would continue. Periodic monitoring of line transects would continue on a limited number of units to track trends in progress toward improving native prairie habitat. Four-square-mile waterfowl pair counts would be completed as scheduled. Various cooperative research efforts with other agencies and organizations would continue. Staff would continue to use available information and sound science to make informed management decisions. District staff would complete Service-mandated surveys on wildlife and habitat within specified timeframes, and some baseline monitoring would continue on high-priority tracts.

### **Visitor Services**

Currently, events and workshops with such groups as school districts, youth groups, and conservation groups are conducted upon request. District informational brochures and publications are updated periodically. Displays and exhibits, including signs and brochures, would continue to be maintained at the districts' headquarters, as well as at other public use facilities throughout the lands managed by the districts. The districts implement occasional media outreach efforts through newspaper articles and radio announcements.

WPAs are open to all types of hunting (waterfowl, small game, furbearer) consistent with State regulations. Hunting and fishing programs would continue,

with seasons paralleling the regular statewide seasons. Access is limited to foot traffic on all Service lands, with the exception of identified motorized vehicle trails in specific WPAs.

Public trapping is currently regulated by special use permits on all district lands and targets predator management objectives. Recreational trapping programs on the districts are administered by each district. Recreational trapping on WPAs has been approved by legislation.

### **Partnerships**

Staff would work to preserve existing partnerships that strive to address resource information needs; protect and enhance habitat (both public and private); and promote public use, education, and outreach. Current partners include local private landowners for management, grassland and wetland easement acquisition, weed initiatives, and outreach. The districts also partner with government agencies, such as SDGFP, and NGOs, such as Ducks Unlimited, for assistance with biological projects, acquisition, and public outreach.

### **Operations**

The funding and staffing resources for the districts would remain at current levels to provide the necessary legal and obligated mandates and to provide management for high-priority WPAs.

Operations and maintenance would continue to consist of maintaining buildings, vehicles, and other equipment in good working condition to achieve management goals. Maintenance staff would operate with available funding and resources. Law enforcement personnel and activities would be provided at current levels for visitor safety and protection of facilities and wildlife.

The Service would act in compliance with the NHPA (National Historic Preservation Act) and other pertinent cultural resource laws.

## **ALTERNATIVE B—INCREASED EFFICIENCY (PROPOSED ACTION)**

### **Summary**

Under alternative B, management of the three districts would emphasize developing and implementing an improved, science-based priority system to restore native prairie habitats for the benefit of waterfowl, State- and federally listed species, migratory birds, and other native wildlife. District staff would focus on high-priority tracts and, when possible, on medium-priority tracts. The focus of this alternative would be to restore ecological processes and native grassland species to the greatest extent possible within the parameters of available resources and existing constraints. Under this alternative, district staff would seek to maintain the existing levels and types of public use programs, ensuring that programs offered to the public are of consistently high quality.

## Habitat and Wildlife

Under this alternative, the amount, periodicity, and type of management of native prairie habitats would follow an improved, science-based prioritization system driven by present habitat needs and conditions and the probability of successful native vegetation enhancement. District staff would pursue these targets through enhanced management using existing habitat management tools.

Old croplands would be reseeded utilizing native species in an ongoing process to convert unsuitable nesting habitat (for example, cropland, degraded DNC [Dense Nesting Cover], monotypic cool-season stands of tamegrass) to a diverse native plant community. Species included in the plant mix would be based on historic vegetation composition, soil structure, and requirements of the target species. Established native grass stands and the remainder of the disturbed uplands would be periodically managed to rejuvenate grass, reduce litter accumulations, and control undesirable noxious weeds through haying, grazing, burning, and chemical or biological treatments.

Planted and exotic woody vegetation would be managed to provide the greatest overall benefit to a selected group of target species. This alternative would allow for the removal of trees and shrubs if it is decided that such is the appropriate management direction for the benefit of migratory birds and other native wildlife.

Under this alternative, the Service's Division of Realty would focus acquisition efforts on high-priority easements and some of the highest priority fee tracts (such as roundouts; roundouts are parcels either adjacent or internal to WPAs, the addition of which would enhance the management or ecological value of the WPA) from willing sellers.

Control of invasive species would be the same as under alternative A, but it would be implemented in accordance with a prioritization system.

## Monitoring and Research

Under alternative B, monitoring and research would continue current efforts described for alternative A. District staff would complete some baseline monitoring currently underway on high- and medium-priority tracts. Staff would participate in landscape-level analysis to guide acquisition; promote management-level research to improve habitat management practices; promote further efforts to monitor for improved success of transitioning seeded areas to native grasses (in both composition and structure); and monitor control efforts for nonnative grasses (such as Kentucky bluegrass and smooth brome) and other invasive plant species.

## Visitor Services

Under this alternative, staff would increase the quality of environmental education and interpretation opportunities and facilities to meet the needs of a wide

array of target audiences. Hunting, fishing, wildlife observation, and photography uses would be similar to those under alternative A. Workshops with school groups and teachers would emphasize waterfowl and migratory bird identification.

Media outreach to local newspapers and radio stations would be conducted as often as staff time allows. District brochures and publications would be reviewed annually and updates completed as needed.

All public use facilities would be reviewed to ensure they meet Service standards and, if necessary, upgraded. The Service proposes, at a future date, to construct a new administration/visitor center for the Huron WMD at the Maga-Ta-Hohpi WPA near Huron to meet the demands of public and school group visitation.

## Partnerships

Under this alternative, existing partnerships would be expanded to address habitat and wildlife management in accordance with the new prioritization system. This alternative would encourage ongoing work with local, State, and Federal agencies to explore new avenues to implement the goals of this alternative. Neighboring private landowners would be targeted for new partnerships. This alternative would also promote developing and fostering partnerships with local communities, such as Friends organizations, to inform the public of district programs and special events.

## Operations

This alternative would not necessitate an increase but rather a redistribution of resources and staffing. These changes would follow the prioritization system in district operations to address program needs, pursuing an "increased efficiency" strategy.

Operations and maintenance would be redistributed and managed to support management of priority resources. A minimum threshold of staffing needs, equipment, and funding would be identified to support management. It is believed that no increase in funding for staffing, equipment, or supplies would be necessary to achieve the goals and objectives of this alternative. However, an increase in both funding and staffing would afford the districts the possibility of improving the management of lower priority tracts.

As under alternative A, law enforcement would be provided for visitor safety and protection of facilities and wildlife.

The Service would act in compliance with the NHPA and other pertinent cultural resource laws.

## ALTERNATIVE C—INCREASED EFFICIENCY WITH EXPANDED RESOURCES

### Summary

Under alternative C, management would follow the same prioritization system for restoration and management as under alternative B, but it would be based on

projected staffing and funding increases. The management focus, like that of alternative B, would follow an improved prioritization system, but would also widen into additional WPAs. With increased funding and staffing, acquisition of new WPAs in fee title would increase. Similarly, increased funding and staffing would enable commensurate increases in the number and scope of partnerships. The districts would continue to provide the same types of public uses but would expand the scope and quality of these opportunities.

Under alternative C, management targeting native prairie/wetland complexes would be more intensive and widespread. District staff would seek out projects for restoring high-quality native prairie in both high- and low-priority tracts. This alternative would have the potential to provide additional management options to address habitat requirements and wildlife needs. The staff would seek to develop new environmental education and public use programs as well as to reach out to new users. As under alternative B, the Service proposes, at a future date, a new administration/visitor center for the Huron WMD at the Maga-Ta-Hohpi WPA near Huron.

### **Habitat and Wildlife**

Under alternative C, all WPAs in all three districts would receive consistent management based on the prioritization system.

District staff would intensively manage native prairie/wetland complexes that would focus on the most intact systems, which are more likely to support a wide range of migratory bird species, especially those of management concern. Restoring grasslands to high-quality native prairie would be a priority. Emphasis would be placed on the restoration of healthy areas of native mixed- and tallgrass prairies to benefit ground-nesting species of migratory birds.

Management of disturbed upland habitats would be driven by the resource needs of waterfowl and shorebirds. Under this alternative, old cropland sites and badly degraded native prairies would be the lowest priority, but they would be managed to attract high densities of waterfowl species that use DNC; efforts to increase nest and brood survival would focus on these tracts.

District staff would expand the pursuit of easement acquisition and enforcement through proactive mapping and strong enforcement actions. Acquisition efforts would be directed at high-priority easements, fee-title WPAs, and roundouts. Under alternative C, acquisition of WPA easements would focus on high-priority native prairie and wetlands.

Because native prairie habitat has more long-term value for supporting ducks and other grassland birds than those areas invaded by introduced grasses and forbs, all nonnative invasive species would be managed on priority WPAs, allowing for management actions

that provide the greatest benefit to migratory birds and resident wildlife. This alternative would allow for the removal of existing nonnative trees and shrubs for the benefit of native wildlife, such as grassland-dependent passerines, upland-nesting shorebirds, and waterfowl.

Management of invasive species under alternative C would be the same as under alternative B, but would address a greater extent of lands because of the increased levels of funding and staffing.

### **Monitoring and Research**

Monitoring and research activities would parallel those described for alternative B, with the addition of addressing specific management questions. Research funds would be available for graduate student work and self-directed research projects.

### **Visitor Services**

The current level and quality of environmental education and interpretation opportunities and facilities would be expanded to meet the needs of a wide array of target audiences. District staff would seek to develop programs that enhance public use, outdoor classroom activities, and interpretive exhibits and displays.

Public use events such as teacher and waterfowl identification workshops presented by district staff would be expanded over current levels and possibly conducted annually. Brochures and publications would most likely be reviewed and renewed annually. New publications and educational materials would likely be developed to aid in the interpretation of sights and sounds on WPAs.

Outreach would include the media and partner groups such as wildlife clubs and conservation non-profit groups. Presentations to area schools and communities would be a priority.

Under alternative C, as under alternative B, the Service proposes, at a future date, to construct a new administration/visitor center for the Huron WMD at the Maga-Ta-Hohpi WPA near Huron to meet the demands of public and school group visitation.

### **Partnerships**

Partnership development and management would parallel the direction outlined for alternative B. Additionally, under alternative C, existing partnerships with the local public and SDGFP would be expanded. New partnerships—through development of Friends organizations—would be pursued with community members who have an appreciation and interest in the welfare of area districts.

### **Operations**

Operations under alternative C would be the same as alternative B, but with the likely expansion of easement monitoring and enforcement on all conservation easements as a result of increased levels of funding and staffing.

The Service would act in compliance with the NHPA and other pertinent cultural resource laws. District staff would develop an educational program and interpretive opportunities for the public pertaining to cultural resources.

### 3.4 Comparison of Alternatives

Table 3 provides a comparison of alternatives.

**Table 3. Comparison of alternatives.**

	<i>Alternative A (no action)</i>	<i>Alternative B (increased efficiency)</i>	<i>Alternative C (increased efficiency with expanded resources)</i>
<b>Native Prairie</b>			
Conserve, restore, and improve the biological integrity and ecological function of the native prairies to support healthy populations of native plants and wildlife and promote the natural role of fire and grazing in shaping and managing these landscapes.			
Native upland habitats	Continue to use prescribed fire, grazing, and invasive plant control to maintain and improve grassland health. Suppress nonnative introduced grasses and invasive species. Manage to enhance the competitive ability of native plants.	Manage lands according to a priority system. Maintain selected native habitats in as natural or native condition as possible. Continue to use same tools as A.	Same as B, but increase/expand the number of treated units. Restoration would occur on more lands under this alternative.
<b>Invasive Species</b>			
Nonnative trees and shrubs	Continue to remove trees (e.g., shelterbelts, volunteers) according to budgetary constraints and biological justification. Remove trees on a site-specific basis.	Same as A, but prioritize removal of trees on high-priority tracts.	Same as B, but increase/expand the number of treated units. Restoration (removal of trees/shrubs) would occur on more lands under this alternative.
Nonnative introduced grasses	Continue to suppress invasive plants (e.g., smooth brome, Kentucky bluegrass, crested wheatgrass) and promote the competitive abilities of native species to restore grassland health. Continue to use prescribed fire and grazing at current levels as management tools. Continued limitations in management efforts due to current staffing and funding levels.	Same as A, but prioritize management of non-native introduced grasses on high-priority tracts.	Same as B, but increase/expand the number of treated units. Restoration would occur on more lands under this alternative.
Noxious weeds	Maintain current noxious weed management programs. Use IPM (integrated pest management). Control of noxious weeds is limited. Currently, higher use of spot treatments than blanket treatments. Continue to use target-specific herbicides that exert the least impacts on native forbs and grasses.	Same as A, plus establish and maintain an inventory of the degree and density of infestation. Prioritize treatment.	Same as B, but increase monitoring to determine effectiveness of treatment.
Management tools (e.g., fire, grazing, clipping)	Continue to use a range of management tools. Currently, grazing is primary management tool. Continue limited use of prescribed fire. Current use of fire is concentrated on native prairie tracts.	Prioritize and focus management on WPAs with the most restoration potential. Determine which WPAs benefit most from a particular management tool. Continue to use a range of management tools.	Increase use of all tools; drastic increase of prescribed fire. Under this alternative, more WPAs would be managed. Greater use of tools in combination.

**Table 3. Comparison of alternatives.**

	<i>Alternative A (no action)</i>	<i>Alternative B (increased efficiency)</i>	<i>Alternative C (increased efficiency with expanded resources)</i>
<b>Planted Grasslands</b>			
Manage planted grasslands to contribute to the production and growth of continental waterfowl populations, other migratory birds, threatened and endangered species, and other wildlife.			
Tamegrass (DNC [dense nesting cover], brome, Kentucky bluegrass)	Continue to manage as tamegrass; when possible, restore to planted native vegetation. Continue working systematically toward restoration of tamegrass areas to planted native vegetation. Continue to maintain healthy productive stands of tamegrass as an interim step.	Develop formal prioritization system. Focus conversion to planted natives on high-priority WPAs.	Restore more lands and diversify species. This alternative would reflect a finer scale of restoration (e.g., focus more on local ecotype plant material, increased diversity).
Planted native grasslands	Continue managing planted native grasslands to suppress nonnative introduced grasses and invasive species. Use prescribed fire, grazing, and invasive plant control to maintain and improve grassland health. Manage for competitive ability of native plants.	Use same tools as under alternative A. Prioritize and manage lands through a priority system and apply treatments as needed. Maintain planted native grassland habitats in as natural or native condition as possible.	Same as B, but increase/expand the number of treated units and the maintenance/management thereof. “Partial” restoration would occur on more lands under this alternative.
Management tools (fire, grazing, herbicides, cropped land, other)	Cropped land: seedbed preparation for grassland restorations. Continue to use grazing and limited fire and clipping. Continue use of herbicide for preparing cropland and controlling noxious weeds. Continue limited use of cropping/seeding and herbicide in combination (e.g., applying herbicide for restoration then inner-seeding).	Continue use of the same tools as under alternative A. Determine which WPAs show best restoration potential and focus use of available management tools on those.	Continue use of the same tools as under alternative A but increase their rate of use, with dramatic increase in the use of prescribed fire. Under this alternative, more tracts would be managed by one tool or another. Implement greater use of management tools in combination (e.g., use grazing and fire together).
<b>Invasive Species</b>			
Nonnative trees and shrubs	Continue to remove trees (e.g., shelterbelts, volunteers) according to budgetary constraints and biological justification. Remove trees on site-specific basis.	Same as A, but prioritize removal of trees on high-priority tracts.	Same as B, but increase/expand the number of treated units. Restoration (removal of trees and shrubs) would occur on more lands under this alternative.
Nonnative introduced grasses	Continue to use grazing and prescribed fire as tools. Continue to suppress invasives (e.g., smooth brome, Kentucky bluegrass, crested wheatgrass) in restored grasslands and promote the competitive abilities of native species to restore grassland health. Management efforts are limited by staffing and funding levels.	Same as A, but prioritize.	Same as B but increase/expand the number of treated units. Restoration would occur on more lands under this alternative.

**Table 3. Comparison of alternatives.**

	<i>Alternative A (no action)</i>	<i>Alternative B (increased efficiency)</i>	<i>Alternative C (increased efficiency with expanded resources)</i>
Noxious weeds	Maintain current noxious weed management programs (these vary from district to district and from more structured to reactionary). Use IPM. Control of noxious weeds is limited. Continue to conduct more blanket spaying in areas of grass as opposed to areas of grass-forb mix (i.e., more spot treatments in areas of grass-forb mix). Use target-specific herbicides to minimize impacts on native forbs and grass.	Use IPM. Establish and maintain an inventory of the degree and density of infestation. Prioritize treatment.	Increase monitoring to determine effectiveness of treatment. Use IPM.
<b>Wetlands</b>			
Protect, restore, and enhance prairie pothole wetlands to support diverse plant communities and provide habitat to waterfowl, shorebirds, wading birds, and associated wetland-dependent wildlife.			
Wetlands without water control structures	Protect existing wetlands from drainage or other manipulation (e.g., tilling). Restore and maintain natural hydrology if possible. Wetland management is dependent on management of surrounding uplands (i.e., they are not managed separately from uplands). Management efforts in wetlands are dependent on available staff and funding.	Management of wetlands based both on the prioritization and management of surrounding uplands, as well as some targeted management of wetlands, where appropriate (based on specific prioritization tools developed under this alternative). Prioritization based on the degree of wetland degradation and also the management potential of the area. Identify and actively manage degraded wetlands where possible. Winter burn of cattails, herbicide treatments, etc.	Pursue active management of wetlands. Identify areas of wetland degradation and actively manage them where possible. More wetlands would be managed than under alternative B.
Wetlands with water control structures	Same as for wetlands without water control structures, except staff can manipulate water levels. Structures do not provide complete control.	Same as A, plus assess the potential for increased management of water levels.	Same as B, plus take an active role in managing water levels.
Water resources (artificial drainage affecting hydrology)	Currently, staff is uncertain of legal rights regarding acceptance of drainage.	Request and secure a comprehensive water rights and hydrology compendium from USFWS Region 6 Water Resources Division.	Same as B.
Management tools (fire, grazing, mowing, herbicides, other)	Continue to use a variety of tools. Because wetland management would continue to reflect management of surrounding uplands, continue primary dependence on grazing and limited use of prescribed fire.	Prioritize and focus management on wetlands that have the greatest need. Determine which tool is most appropriate to use in those wetlands that will benefit most (based on degree of degradation).	Same as B, except more units would be treated by appropriate management tools.
<b>Invasive Species</b>			
Nonnative trees and shrubs (e.g., salt cedar)	Continue to use a reactive rather than a proactive management approach. Continue to monitor known sites and actively treat them. Goal is eradication at early infestation, but this is difficult to achieve.	Same as A.	Utilize proactive approach to treatment and monitoring. Develop partnerships with groups to assist in monitoring and removal.

**Table 3. Comparison of alternatives.**

	<i>Alternative A (no action)</i>	<i>Alternative B (increased efficiency)</i>	<i>Alternative C (increased efficiency with expanded resources)</i>
Nonnative introduced grasses	Currently engaged in research (adaptive management project on reed canary grass). Continue treating reed canary grass as part of management of surrounding uplands.	Same as A.	Same as A, but more inventory with the purpose of understanding levels of reed canary grass infestation. More actively fight reed canary grass using the adaptive management study.
Noxious weeds	Maintain current noxious weed management programs (these vary from district to district and from more structured to reactionary). Use IPM. Control of noxious weeds is limited. Continue to use required herbicides.	Continue to use IPM. Establish and maintain an inventory of the degree and density of infestation. Prioritize treatment.	Increase treatment of noxious weeds using IPM. Increase monitoring to determine effectiveness of treatment.
<b>Research and Monitoring</b>			
Provide a learning platform that uses science, monitoring, applied research, and adaptive management to advance understanding of the Prairie Pothole Region and management of these areas.			
Research	Continue to accommodate requests for use of lands for research on a case-by-case basis. Allow and participate in research as feasible and practical. Currently, there is extensive research conducted on WMD lands. Research involves a wide variety of topics relevant to the Prairie Pothole Region. Currently staff is exploring adaptive management model (Northern Prairie).	Same as A, plus participate in the development/implementation of adaptive management models to benefit WMD management.	Proactively pursue research. Shift toward more Service-directed research. Identify research needs ahead of time and work with partners to achieve. More staff and increased partnerships will lead to more research.
Inventory and monitoring	Currently, staff applies principles of adaptive management, but not in a formalized, structured way. Currently pursuing baseline data (varies from district to district). Currently in the initial phase of monitoring management actions and addressing specific management questions. Continue mandated surveys (e.g., four-square mile). Ongoing refinement of inventory.	Same as A, but monitoring would become more strategic. Focus adaptive management on high-priority tracts or issues.	Complete baseline inventory and refine ongoing inventory. Expand monitoring to all tracts. More monitoring would enable increased effectiveness of management. Expand partnerships for monitoring.
<b>Consumptive Uses</b>			
Provide visitors with quality opportunities to enjoy hunting, fishing, and trapping in waterfowl production areas and expand their knowledge and appreciation of the prairie landscape and the National Wildlife Refuge System.			
Hunting	All WPAs are open to hunting (unless there is a specific decision to close). There are no special regulations regarding hunting. All WPAs are open to hunting of species allowed by State: (e.g., big game, waterfowl). Over time, continue to provide more hunting opportunities through limited acquisition of additional fee lands.	Same as A.	Same as A, but provide more hunting opportunities through acquisition of additional fee lands.

**Table 3. Comparison of alternatives.**

	<i>Alternative A (no action)</i>	<i>Alternative B (increased efficiency)</i>	<i>Alternative C (increased efficiency with expanded resources)</i>
Fishing	<p>Continue to allow public access to WPAs that sustain fisheries. In cooperation with SDGFP, certain WPAs are closed to fishing to enable rearing of brood stock/fingerlings.</p> <p>The Service maintains access to certain WPAs that sustain fisheries and are open to public.</p> <p>Some are adjacent to meanders; public can access these from WPAs.</p> <p>Access points are provided (trail to the water); these are not enhanced.</p> <p>Limited stocking (one site, stocked by SDGFP).</p>	Same as A.	Provide additional fishing opportunities through acquisition of more fee lands.
Trapping	Continue to allow recreational trapping on WPAs per State regulations.	Same as A.	Provide more trapping opportunities through acquisition of additional fee lands.
Other (e.g., fruit harvesting)	Harvesting wild fruits (including mushrooms) is currently allowed for personal use.	Same as A.	Provide more opportunities for harvesting wild fruits through acquisition of additional fee lands.
<b>Nonconsumptive Uses</b>			
Provide visitors with quality opportunities to enjoy, observe, photograph and appreciate the prairie ecosystem while expanding their knowledge of and support for the National Wildlife Refuge System.			
Photography and wildlife observation	<p>Photography and wildlife observation are allowed and encouraged.</p> <p>There are an abundance of opportunities, but use is currently loosely monitored.</p> <p>Some facilities for wildlife observation/photography (i.e., a few blinds and observation platforms) are provided where there are good opportunities and the use is compatible. Existing facilities are used by small, dedicated community of photographers.</p> <p>Additional facilities are provided as opportunities present themselves (opportunistic approach).</p> <p>Currently, staff wishes to increase number of blinds and platforms/ towers, but this depends on funding.</p> <p>Improvements to the Auto Tour at the Madison WMD with interpretive panels and other facilities are currently underway.</p> <p>Some instructional programs on photography are currently offered (e.g., at the annual Prairie Fest, groups are taken to WPAs).</p> <p>Currently, the Service partners with the State to promote opportunities for wildlife observation/photography. For example, all three WMDs are highlighted in a brochure as part of a state-wide birding trail.</p>	<p>Assess the quality of the existing program to determine if there are any needs that should be addressed.</p> <p>Increase accessibility by providing an accessible blind.</p> <p>Increase number of blinds and platforms/towers for observation.</p> <p>Proactively identify suitable locations and opportunities for facilities. Enlist help of photographers and others in this effort.</p> <p>Focus new facilities in places already developed for public use (e.g., Maga-Ta-Hohpi, Madison WPAs).</p> <p>Proactively promote the opportunities for observation/photography.</p> <p>Update species list for Sand Lake WMD.</p>	<p>Same as B, plus provide more opportunities through acquisition of more fee lands.</p> <p>Build new facilities (e.g., observation towers, blinds). Consider building new facilities in new locations (i.e., not just areas where efforts are currently focused).</p> <p>Actively pursue partnerships to provide more facilities.</p> <p>Explore opportunities to increase partnerships with photographers (e.g., promotional purposes).</p> <p>Outdoor recreation planner would likely coordinate partnerships and work with groups to provide more opportunities.</p> <p>Update species list for Sand Lake WMD by developing a partnership.</p>

**Table 3. Comparison of alternatives.**

	<i>Alternative A (no action)</i>	<i>Alternative B (increased efficiency)</i>	<i>Alternative C (increased efficiency with expanded resources)</i>
Other uses (e.g., geo-caching, virtual geo-caching, pod-casting)	<p>The Service is currently developing policy with regard to geo-caching (virtual geo-caching is already deemed compatible). Geo-caching is on the rise nationally and has been identified in Region 6 as an opportunity for attracting new users. This activity is likely already occurring on Service lands.</p> <p>Currently working with the City of Madison to build a hiking and biking trail at the Payne WPA, which will eventually connect with the Auto Tour route at the Madison WPA.</p>	Influence policy decision regarding geo-caching.	<p>If geo-caching is determined to be compatible, pursue opportunities on district lands.</p> <p>Explore opportunities presented by new media and technology.</p>
<b>Environmental Education and Interpretation</b>			
Provide quality educational opportunities for persons of all abilities to learn about, understand, and appreciate prairie landscapes and the role of the National Wildlife Refuge System.			
Programs	<p>Sustain environmental education and interpretation programs at existing levels.</p> <p>Accommodate requests for programs when contacted by schools or other groups.</p> <p>Currently, there is no outdoor recreation planner position. All staff contributes to environmental education/interpretive programs such as those offered at SD Outdoor Expo or Huron Prairie Fest.</p> <p>Huron Friends Group goal is to offer programs quarterly.</p>	<p>Evaluate effectiveness of existing environmental education/interpretive programs.</p> <p>Improve quality of existing programs.</p> <p>Evaluate community interest for potential new programs.</p>	<p>Evaluate community interest for new programs and implement them.</p> <p>Take advantage of new staffing (such as dedicated outdoor recreation planner position) to greatly improve outreach to communities (“Take it to the communities”).</p> <p>Increase outreach to children and educate public on the purposes of the WMDs and their role in the System.</p> <p>Outdoor classroom idea: turn key WPAs (e.g., those close to a community) into outdoor classrooms by partnering with schools and other groups.</p> <p>Explore opportunities presented by new technology and other interpretive media.</p>
Facilities (contact stations, displays, kiosks, signs)	<p>Continue to maintain a limited number of displays and exhibits at the contact stations, along with brochures, signs, and public use facilities in various areas.</p> <p>Existing interpretive signs tend to be outdated. Currently staff is working to improve and update interpretive panels on all WMDs.</p> <p>There is a proposal to construct a new district headquarters office and visitor center for the Huron WMD at the Maga-Ta-Hohpi WPA.</p> <p>There is a proposal for office expansion for Madison WMD.</p>	Same as A.	<p>Explore opportunities presented by new technology and media.</p> <p>Create satellite office/contact station for the Sand Lake WMD.</p> <p>Expand existing facilities to accommodate new staff.</p> <p>New high-quality displays and signs for existing and future headquarters-contact stations (i.e., treat any new facilities/signs as an opportunity for increasing quality).</p>

**Table 3. Comparison of alternatives.**

	<i>Alternative A (no action)</i>	<i>Alternative B (increased efficiency)</i>	<i>Alternative C (increased efficiency with expanded resources)</i>
<b>Operations and Administration</b>			
Through effective communication and innovative partnerships, secure and efficiently utilize funding, staffing, and volunteer programs for the benefit of all natural resources in the districts.			
Land protection (e.g., purchases, easements, exchanges, residential development, wind power)	Maintain current practice of easement acquisition based on funding levels. Continue limited fee title acquisition. Acquisition tends to occur when landowners approach the Service. Stay engaged in developing policies related to development requests.	Evaluate current land acquisition program. Explore new methods of prioritizing lands for acquisition. Prioritize acquisitions in core areas that need protection. Continue evaluating lands for efficiency/effectiveness, but use a finer level of precision than under A.	With increased staff and funding, place greater emphasis on expanding fee title lands. Eliminate current backlog. Expand more partnerships for land acquisition. Strengthen public education regarding the importance of the Duck Stamp to acquisition.
Funding	Funding for all key programs would remain inadequate.	Same as A.	Increased funding.
Staffing (including volunteers)	Staffing would remain inadequate. Volunteers are not actively pursued unless funding is available. Currently staff is working to develop a long-term volunteer program.	Same as A.	Increase personnel. Staff current organization chart. Increase recruitment of volunteers.
Infrastructure (e.g., roads, buildings)	Maintain infrastructure at current levels. Current funding is inadequate to maintain infrastructure. Roads are maintained. Certain management trails are in poor shape. It is difficult to access lands using these trails. Fences are in various stages of disrepair. Currently in the process of installing updated boundary signs.	Same as A.	Complete inventory of infrastructure. Address deficiencies and increase maintenance of infrastructure.
Equipment (e.g., vehicles, machinery, tools)	Maintain existing equipment at current levels. Continue to explore new equipment/technology that may increase efficiency.	Same as A.	Fund high-priority equipment that will increase management effectiveness and efficiency. Increased staff means that more vehicles would be needed.
Law enforcement (e.g., trespassing, illegal uses)	Maintain existing levels of law enforcement. Violations on both easement and fee-title lands appear to be on the rise. More violations are occurring (e.g., trespassing, guided hunts). Currently staffing is inadequate to address these issues.	Same as A.	Additional staff could address law enforcement deficiencies. Increase and improve outreach to neighbors to promote "eyes on the land." Notify landowners of their easement obligations. Increase outreach to other agencies.
Cultural resources	Continue mandated protection of cultural resources and continue inventory procedures as needed.	Same as A.	Same as A, and review all known cultural resources for interpretive and educational values.

**Table 3. Comparison of alternatives.**

	<i>Alternative A (no action)</i>	<i>Alternative B (increased efficiency)</i>	<i>Alternative C (increased efficiency with expanded resources)</i>
<b>Partnerships</b>			
Promote and develop partnerships with landowners, public and private organizations, and other interested individuals to maintain, restore, and enhance a diverse and productive landscape in the Prairie Pothole Region.			
Volunteer programs	In many ways, volunteers help fulfill the Service's mission. Volunteers are not actively pursued unless funding is available. Currently, working to develop a long-term volunteer program.	Same as A.	Prioritization would guide volunteer efforts. Aggressively pursue volunteers with the desired skills to achieve specific tasks. Outdoor recreation planner or volunteer coordinator added to staff to coordinate new partnership efforts.
Friends Groups	Currently Huron is the only district with a Friends Group. They assist Huron in a variety of capacities (outreach, education, advocacy, fundraising).	Huron would grow Friends Group membership.	Pursue Friends Group for other districts.
Other (State, landowners and NGOs, public)	Maintain existing partnerships. Depending on project needs, work with network of partners to accomplish mission.	Same as A.	More staff would lead to increased partnerships. Explore opportunities to partner with new groups.



# CHAPTER 4—Affected Environment



Bridgette Flanders-Wanner/USFWS

*Grasslands in the Millerdale Waterfowl Production Area.*

The three wetland management districts manage thousands of noncontiguous tracts of Federal land totaling 1,136,965 acres: 100,094 acres of WPAs and 1,036,871 acres of conservation easements. This chapter describes the physical environment and biological resources of these district lands, as well as fire and grazing history, cultural resources, visitor services, socioeconomic environment, and district operations.

## 4.1 Physical Environment

The districts are located in central and eastern South Dakota from west of the Missouri River to the Minnesota state line, and from the North Dakota border roughly two-thirds of the way south to the state line of Nebraska.

The prairies of South Dakota have become an ecological treasure of biological importance for waterfowl and other migratory birds. The prairie potholes of the Dakotas support a wide diversity of wildlife, but they are most famous for their role in waterfowl production. Although the Prairie Pothole Region occupies only 10 percent of North America's waterfowl breeding range, it produces approximately 50 percent of the continent's waterfowl population. Complexes of wetlands scattered throughout the three districts attract breeding duck pairs. While semipermanent and permanent wetlands provide brood-rearing habitat and migratory stopover habitat, respectively, it is the

smaller temporary and seasonal wetlands that draw breeding duck pairs to South Dakota and other parts of the Prairie Pothole Region.

### CLIMATE CHANGE

In January 2001, the Department of the Interior issued Order 3226, requiring its Federal agencies with land management responsibilities to consider potential climate change effects as part of long-range planning endeavors. The U.S. Department of Energy's report, "Carbon Sequestration Research and Development," concluded that ecosystem protection is important to carbon sequestration and may reduce or prevent loss of carbon currently stored in the terrestrial biosphere. The report defines carbon sequestration as "the capture and secure storage of carbon that would otherwise be emitted to or remain in the atmosphere." The increase of CO<sub>2</sub> (carbon dioxide) in the earth's atmosphere has been linked to the gradual rise in surface temperature commonly referred to as "global warming."

In the context of comprehensive conservation planning for the districts, the strategies that manage and increase grassland vegetation contribute to the sequestration of carbon, constituting a primary climate-related effect. Large, naturally occurring communities of plants and animals that occupy major landscapes (for example, grasslands, forests, wetlands, tundra, and desert) are effective both in preventing carbon emission and in acting as biological "scrubbers" of atmospheric CO<sub>2</sub>.

One Service activity in particular—prescribed burning—releases CO<sub>2</sub> directly to the atmosphere from the biomass consumed during combustion; yet it results in no net loss of carbon sequestration capacity because new vegetation quickly germinates and sprouts to replace the consumed biomass. This vegetation sequesters an approximately equal amount of carbon as was lost through the prescribed burning (Dai et al. 2006).

Interestingly, EPA's (U.S. Environmental Protection Agency's) 1998 publication, "Climate Change in South Dakota" (EPA 236-F-98-007x) directly addressed Service interests in the State:

"Based on model projections, national wildlife refuges in South Dakota appear to be among the most vulnerable in the United States to changes in climate. The region's national wildlife refuges and prairie pothole systems appear to be especially sensitive to changes in precipitation and temperature. Sixty percent of the annual variation in the number of these wetlands can be explained by year-to-year changes in temperature and precipitation. Smaller wetlands may be particularly vulnerable to climate change. Projections show that warmer annual temperatures affect wetlands by reducing open water and increasing vegetation cover, independent of precipitation. Rising temperatures, if continued for several years, may decrease breeding bird density and diversity in this critically important waterfowl habitat. Major additional threats to ecosystems include habitat loss and species extinction, increased fire frequency, and increased vulnerability to invasive plant and insect species."

## CLIMATE

South Dakota's interior continental climate exhibits an extreme range of temperatures between summer and winter, common high winds, and cyclic wet/dry periods. Normal temperatures (1971–2000) vary surprisingly little between the northwest and southeast corners of the three-district area. January minimum temperatures average 3.4°F in Mobridge and 2.9°F in Sioux Falls, while July maximum temperatures average 85.4°F in Mobridge and 85.6°F in Sioux Falls. A bigger difference is evident comparing southwest to northeast. January minimum temperatures average 7.7°F in Pierre versus -0.5°F in Clear Lake, while July maximum temperatures average 89.2°F in Pierre compared to 81.6°F in Clear Lake. The record low temperature in the three-district area was -48°F at Miller on January 12, 1912, while the record high was 120°F at Gann Valley on July 5, 1936.

Normal annual precipitation (1971–2000) averaged 24.69 inches in Sioux Falls in the southeast, decreasing to 16.94 inches in Mobridge. Sioux Falls receives an average of 41 inches of snow per year.

## PHYSIOGRAPHY, GEOGRAPHY, AND SOILS

### Physiography

Because districts cover such a large geographic area, the physical environment and biological resources are described here in the context of level III and level IV physiographic regions (Bryce et al. 1996). Four physiographic regions (ecoregions) occur in the three-district area: Northwestern Glaciated Plains, Northwestern Great Plains, Northern Glaciated Plains, and Western Cornbelt Plains (figure 8).

Level III ecoregions are distinguished by patterns of biotic and abiotic phenomena: vegetation, climate, soils, land use, wildlife use, and hydrology. Local biotic and abiotic factors are used to further subdivide the level III ecoregions into level IV ecoregions—the finest level in the hierarchy (Bryce et al. 1996). The descriptions below of the ecoregions that constitute the three-district area are adapted from "Ecoregions of North Dakota and South Dakota" (USGS 2006).

#### *Northwestern Glaciated Plains—Ecoregion 42 (Level III)*

Portions of the Huron and Sand Lake WMDs are in this ecoregion. The Northwestern Glaciated Plains ecoregion marks the westernmost extent of continental glaciation. The youthful morainal (ridges of rock debris at the margins of glaciers) landscape has significant surface irregularity and high concentrations of wetlands. The rise in elevation along the eastern boundary defines the beginning of the Great Plains. Land use is transitional between the intensive dryland farming in the level IV Drift Plains ecoregion to the east and the predominance of cattle ranching and farming in the Northwestern Great Plains ecoregion to the west.

#### *Missouri Coteau—Ecoregion 42a (Level IV)*

Like closely spaced ocean swells, the rolling mounds of the Missouri Coteau enclose countless wetland depressions, or potholes. During its slow retreat, the Wisconsin glacier stalled at the Missouri escarpment for thousands of years, melting slowly beneath a mantle of sediment to create the characteristic pothole topography of the coteau. The wetlands of the Missouri Coteau and the neighboring Prairie Pothole Region contain the majority of the WPAs in North America. Land use on the coteau is a mixture of tilled agriculture in flatter areas and grazing on steeper slopes.

#### *Missouri Coteau Slope—Ecoregion 42c (Level IV)*

The Missouri Coteau Slope ecoregion declines in elevation from the Missouri Coteau ecoregion to the Missouri River. Unlike the Missouri Coteau ecoregion, where there are few streams, the Missouri Coteau Slope has a simple drainage pattern and fewer wetland depressions. Because of the level to gently rolling topography, the Missouri Coteau Slope supports more cropland than the Missouri Coteau ecoregion. Cattle graze on the steeper land along drainages.

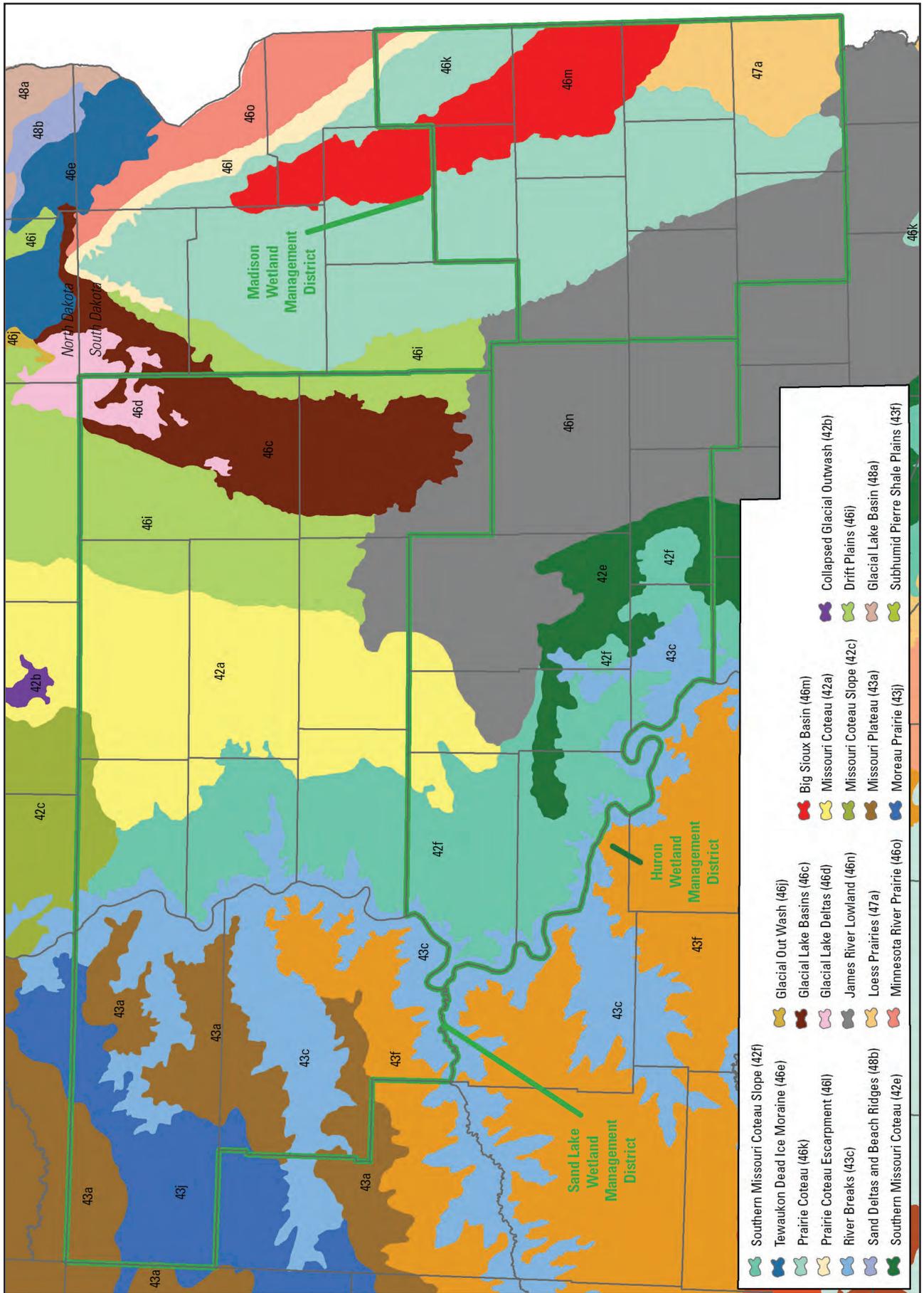


Figure 8. Draft Level III and IV Ecoregions of South Dakota.

***Southern Missouri Coteau—Ecoregion 42e (Level IV)***

The Southern Missouri Coteau ecoregion, on the southern fringe of continental glaciation, exhibits a muted coteau topography: gentle undulations rather than steep hummocks, smaller areas of high wetland density, and more stream erosion backcutting into areas of internal drainage. There is more tilled land on the Southern Missouri Coteau than on the Missouri Coteau because of its gentler topography. More soybeans and corn are planted on the Southern Missouri Coteau because of its milder climate and increased precipitation.

***Southern Missouri Coteau Slope—Ecoregion 42f (Level IV)***

The Southern Missouri Coteau Slope ecoregion differs from the Missouri Coteau Slope to the north; it has mesic rather than frigid soils and a substantial cap of rock-free loess. To the south, the coteau areas east of the Coteau Slope ecoregions become progressively narrower and more eroded. The level to rolling uplands of the Southern Missouri Coteau Slope are planted in sunflowers, wheat, millet, and barley. Corn is a marginal crop that does well in wet years. The stream drainages tend to be grazed. Willows, green ash, and elm grow in the riparian areas.

***Northwestern Great Plains—Ecoregion 43 (Level III)***

Roughly the western third of the Sand Lake WMD and small portions of the south-central Huron WMD are within this ecoregion. The Northwestern Great Plains ecoregion encompasses the Missouri Plateau section of the Great Plains. It is a semiarid rolling plain of shale, siltstone, and sandstone punctuated by occasional buttes and badlands. Native grasslands persist in areas of steep or broken topography, but they have been largely replaced by spring wheat and alfalfa over most of the ecoregion. Agriculture is limited by erratic precipitation patterns and limited opportunities for irrigation.

***Missouri Plateau—Ecoregion 43a (Level IV)***

The Missouri Plateau typifies the “wide open spaces” of the American West. The topography was largely unaffected by glaciations, retaining its original soils and complex stream drainage pattern. The historic shortgrass prairie is now a mosaic of wheat, alfalfa, and grazing land.

***River Breaks—Ecoregion 43c (Level IV)***

The River Breaks form broken terraces and uplands that descend to the Missouri River and its major tributaries. They have formed in soft, easily erodible strata such as Pierre shale. The dissected topography, wooded draws, and uncultivated areas provide a haven for wildlife. Riparian gallery forests of cottonwood and green ash persist along major tributaries such as the Grand, Moreau, Cheyenne, Bad, and White rivers, but

such habitats have been largely eliminated along the Missouri River by impoundments.

***Subhumid Pierre Shale Plains—Ecoregion 43f (Level IV)***

Continued vegetative cover is essential to keep the soft, black shale soils intact. Tilling the hillsides risks wind and water erosion; stream channels are deeply incised and slumping is common along exposed banks.

***Moreau Prairie—Ecoregion 43j (Level IV)***

This ecoregion is characterized by occasional buttes, areas of badlands, and numerous salt pans. The soils tend to be alkaline, making the Moreau Prairie less agriculturally productive than surrounding areas (ecoregion 43a). Most of the region is grazed by cattle, sheep, and antelope.

***Northern Glaciated Plains—Ecoregion 46 (Level III)***

Portions of all three districts are in this ecoregion. Also commonly referred to as the Drift Prairie, this area was subject to scouring and deposition during prolonged glacial activity between 70,000 and 10,000 years ago. A flat to gently rolling landscape of glacial drift characterizes the Northern Glaciated Plains ecoregion. The subhumid conditions foster a grassland transition between the tall- and mixed-grass prairies. High concentrations of temporary and seasonal wetlands create favorable conditions for duck nesting and migration. Although the tilled soil is very fertile, agricultural success is subject to annual climatic fluctuations.

***Glacial Lake Basins—Ecoregion 46c (Level IV)***

Lake Dakota once occupied the Glacial Lake Basins. Proglacial (adjacent to a glacier) lakes were formed when major stream or river drainages were blocked by glacial ice during the Pleistocene. The smooth topography of the Glacial Lake Basins, even flatter than the surrounding Drift Plains, resulted from the slow buildup of water-laid sediments. The level, deep soils in the lake plains are intensively cultivated with a prevalence of corn and soybeans.

***Glacial Lake Deltas—Ecoregion 46d (Level IV)***

The Glacial Lake Deltas were deposited by rivers entering glacial lake basins (see above). The heaviest sediments, mostly sand and fine gravel, formed delta fans at the river inlets. As the lake floors were exposed during withdrawal of the glacial ice, wind reworked the sand in some areas into dunes. In contrast to the highly productive, intensively tilled glacial lake plains, the dunes in the delta areas have a thin vegetative cover and a high risk for wind erosion. These areas are used mainly for grazing or irrigated agriculture.

***Drift Plains—Ecoregion 46i (Level IV)***

On the Drift Plains, the retreating Wisconsinan glaciers left a subtle, rolling topography and a thick mantle of glacial till (mixture of clay, sand, and rocks).

A greater proportion of temporary and seasonal wetlands are found in the Drift Plains than in the coteau areas, where semipermanent wetlands are numerous. Because of the productive soil and level topography, this ecoregion is almost entirely cultivated, with many wetlands drained or simply tilled and planted. However, valuable waterfowl habitat still remains, concentrated in State- and federally sponsored duck production areas. The historical grassland in the Drift Plains was a transitional mix of tall- and mixed-grass prairie. The prairie grasses have been largely replaced by fields of spring wheat, barley, sunflowers, and alfalfa.

*Prairie Coteau—Ecoregion 46k (Level IV)*

The Prairie Coteau ecoregion, like the Missouri Coteau, is the result of stagnant glacial ice melting beneath a sediment layer. The tightly undulating, hummocky landscape has no drainage pattern; it is perforated with closely spaced semipermanent and seasonal wetlands. However, the Prairie Coteau differs from the Missouri Coteau in two ways. It supports a chain of large lakes that were formed where there was little ice shear, and its higher precipitation levels support widespread burr oak woodlands near wetland margins.

*Prairie Coteau Escarpment—Ecoregion 46l (Level IV)*

The Prairie Coteau Escarpment ecoregion, though small, is a distinctive ecosystem, rising 300–600 feet from the Minnesota River valley to the brow of the Prairie Coteau. The elevation, broken topography, and sufficient precipitation favor dense deciduous forest growth in riparian areas. Cool, perennial streams flow off the escarpment, providing habitats and oxygenated water not found elsewhere in eastern South Dakota.

*Big Sioux Basin—Ecoregion 46m (Level IV)*

The Big Sioux Basin is a trough penetrating the core of the Prairie Coteau. Its topography was affected by pre-Wisconsinan glaciation; later advances of the Wisconsin glacier diverged around the basin. In contrast to the neighboring Prairie Coteau, the basin has a well-developed drainage network. There is more tilled land in the Big Sioux basin due to the relative paucity of wetlands and the gentler topography.

*James River Lowland—Ecoregion 46n (Level IV)*

The boundary between the James River Lowland and the Drift Plains to the north is a broad phenological and climatic transition zone. The James River Lowland ecoregion is characterized by mesic soils, warmer temperatures, and a longer growing season than the Drift Plains. These differences are reflected in the crop types of the region. Winter wheat, corn, and soybeans are more prevalent in this ecoregion's milder climate.

*Minnesota River Prairie—Ecoregion 46o (Level IV)*

This ecoregion is present only in the extreme northeast corner of the Madison WMD. Thick glacial drift

composes the level terrain of the Minnesota River Prairie. Wetlands are common, though they are fewer and less persistent than those in the neighboring stagnation moraines. The desiccating winds and historic fire regime promoted the prairie ecosystem in this region; however, it is transitional to woodland that occurs to the north and east in Minnesota. Today, the original tallgrass prairie has been replaced by intensive agriculture for grain, corn, and soybeans.

**Western Corn Belt Plains—Ecoregion 47 (Level III)**

This ecoregion is present in the southeastern corner of the Madison WMD. Once covered with tallgrass prairie, more than 75 percent of the Western Corn Belt Plains is now used for cropland agriculture, and much of the remainder is in forage for livestock. A combination of nearly level to gently rolling glaciated till plains and hilly loess plains; an average annual precipitation of 25–35 inches, which occurs mainly in the growing season; and fertile, warm, moist soils make this one of the most productive areas of corn and soybeans in the world. Major environmental concerns in the region include surface and groundwater contamination from fertilizer and pesticide applications as well as from the effects of concentrated livestock production.

*Loess Prairies—Ecoregion 47a (Level IV)*

The Loess Prairies of Iowa and South Dakota surround the perimeter of the Des Moines lobe of the Late Wisconsinan glaciation. Of the two areas of this ecoregion in South Dakota, the northern is distinguished from neighboring regions by its rock-free soil and a paucity of wetlands. The southern area is more highly dissected, with deciduous woodland and brush on the steeper slopes and in the draws.

**Geography**

Much of the current topography reflects the sculpting of the land by continental ice sheets during the last major glaciation, the Wisconsin Glacial Episode. This episode, the most recent in a cycle of glacial advances and retreats over the last 1.5 million years, began approximately 110,000 years ago and ended about 12,000 years ago. The Wisconsin ice sheets covered large portions of Canada and much of the upper Midwest, including all of eastern South Dakota. The accumulation of hundreds of feet of ice caused the ice to slowly move under its own weight, collecting everything from fine sediments to large boulders on the retreating side and depositing them along the advancing edge. These erosional and depositional events created many of the elements that characterize the landscape of eastern South Dakota.

The slow but constant movement of the glaciers scoured the broad river valleys, and the melting ice at the front of the glaciers carved many of the river channels that now flow through the area. The rolling hills that typify much of the region are also the result

of thousands of years of glaciers repeatedly advancing and retreating, as are the thousands of shallow prairie pothole depressions that dot the region. These potholes are generally shallow wetlands that retain water for at least part of the year, although many have been drained in the last 75 years for use as agricultural fields. Most of the protected areas in the three districts are centered around or next to one or more of these potholes.

## Soils

Three of the twelve dominant soil orders of the United States—mollisols, entisols, and vertisols—occur in eastern South Dakota. Mollisols cover more than 95 percent of the landbase, with the other two orders occurring exclusively along the Missouri River. The following descriptions, adapted from “Soil Taxonomy—A Basic System of Soil Classification for Making and Interpreting Soil Surveys” (NRCS 1999), summarize the taxonomy of these orders and their suborders.

- Mollisols commonly are the very dark colored, base-rich, mineral soils of the steppes. Mollisols are extensive in subhumid to semiarid areas on the plains of North America and recognized as the dominant soil type in all three districts. Many of these soils developed under grass at some time, although many were apparently forested at an earlier time. Mollisols may have any of the defined temperature regimes but do not have permafrost. Mollisols can have any moisture regime, but enough available moisture to support perennial grasses seems to be essential. Where slopes are not too steep, Mollisols are used mainly for small grain in the drier regions and corn or soybeans in the warmer, humid regions.
  - Udolls are the more or less freely drained Mollisols of humid climates. In the United States, their vegetation at the time of settlement was dominantly a tallgrass prairie, but some of the soils on Pleistocene surfaces appear to have supported at some time a boreal forest that was supplanted by grasses several thousand years ago. Most of the Udolls are in the eastern part of the Great Plains or are east of the Great Plains. Udolls dominance is prevalent throughout eastern portions of Madison and Sand Lake WMDs. Where slopes are not too steep, nearly all of these soils are cultivated. Corn and soybeans are the major crops.
  - Ustolls are the more or less freely drained Mollisols of subhumid to semiarid climates. Rainfall occurs mainly during a growing season, often in heavy showers, but it is erratic. Drought is frequent and may be severe. During a drought, soil blowing becomes a problem. Ustolls are extensive soils on the western Great Plains in the United States and the dominant form in all three districts. Most of the Ustolls
    - on the Great Plains in the United States had grass vegetation when the country was settled. The Aridic subgroups supported mostly short grasses, and the others supported mixtures of short and tall grasses.
- The central concept of Entisols is that of soils that have little or no evidence of the development of pedogenic horizons. On many landscapes the soil material is not in place long enough for pedogenic processes to form distinctive horizons. Some of these soils are on steep, actively eroding slopes, and others are on flood plains or glacial outwash plains that receive new deposits of alluvium at frequent intervals. Entisols may have any mineral parent material, vegetation, age, or moisture regime and any temperature regime, but they do not have permafrost. The only features common to all soils of the order are the virtual absence of diagnostic horizons and the mineral nature of the soils.
  - Fluvents are mostly brownish to reddish soils that formed in recent water-deposited sediments, mainly on floodplains, fans, and deltas of rivers and small streams but not in backswamps where drainage is poor. Many Fluvents are frequently flooded unless they are protected by dams or levees. Stratification of the materials is normal. Most of the alluvial sediments are derived from eroding soils or streambanks and contain an appreciable amount of organic carbon, which is mainly in the clay fraction.
  - Orthents are primarily Entisols on recent erosional surfaces. The erosion may be geologic or may have been induced by cultivation, mining, or other factors. Any former soil that was on the landscape has been completely removed or so truncated that the diagnostic horizons for all other orders do not occur. Orthents occur in any climate and under any vegetation.
- The central concept of Vertisols is that of clayey soils that have deep, wide cracks for some time during the year. They shrink when dry and swell when moistened. Before the advent of modern classification systems, these soils were already well known for their characteristic color, the cracks they produce during the dry season, and the difficulty of their engineering properties. These soils are generally sticky in the wet season and hard in the dry season, so they require special cultivation practices regardless of whether modern equipment or traditional implements, such as a hoe or bullock-drawn plow, are used. Shrink-swell processes in soils are related to the total content of clay, the content of fine clay, and mineralogy. Vertisols generally have a high clay content (50–70 percent) and a relatively large proportion of fine clay in the clay fraction.

- Vertisols generally have gentle slopes, although a few are strongly sloping. The natural vegetation is predominantly grass, savanna, open forest, or desert shrub. Most Vertisols are well suited to mechanized farming if there is plenty of rainfall or irrigation water and if suitable management practices are followed. Large areas of Vertisols in the world are not farmed, however, because their cultivation would require too much energy, especially where traditional, low-input methods are used. This constraint is a major limiting land use characteristic of Vertisols.
- Usterts are the Vertisols in temperate areas that do not receive high amounts of rainfall during the summer. Usterts are extensive in Texas, Montana, and western portions of South Dakota. They receive low amounts of rainfall during the summer, and cracks open and close once or twice during normal years. The native vegetation is mostly grasses and forbs. Usterts are used mainly as rangeland or cropland. Because the permeability of these soils is so slow, irrigation may result in waterlogging and a buildup of salinity.

## WATER RESOURCES

The area encompassed by the three districts is drained by three rivers: the Big Sioux on the east, the James in the middle, and the Missouri on the west. The Big Sioux and the James are tributaries of the Missouri, flowing toward it from the north. The Big Sioux River is the only one of the three to originate in South Dakota; its headwaters are in the Madison WMD. It exits from the southeast corner of the district to form the southeastern boundary of South Dakota upstream of its confluence with the Missouri. The James has the flattest gradient of any river its length in North America. Water takes about 1 month to travel through South Dakota. The Missouri River is the largest river system in the United States. Near Pierre, it was impounded by the Oahe Dam in 1952 to create a storage facility of more than 23 million acre-feet.

## Hydrology

Wetlands exist because specific geologic conditions and hydrologic processes favor pooling of water or soil saturation. A unique combination of glaciation and climatic conditions in the Prairie Pothole Region has produced a large number of dynamic aquatic ecosystems that have a tendency neither to receive nor contribute to channelized surface flow. These basins have the potential to impound large volumes of water and undergo long-term, extreme changes in water depth and biotic conditions in response to climatic and seasonal trends.

Prairie pothole wetlands are dynamic, relatively small, shallow basins that vary greatly in their ability



© Chris Bailey

*American white pelicans breed in freshwater areas in the interior of North America.*

to retain surface water, and in their water chemistry, which varies from fresh to hypersaline. In an area where annual and seasonal precipitation varies greatly in form and amount, these wetlands occur in a wide variety of hydrological settings. Consequently, the presence of surface water in these wetlands is largely unpredictable. Superimposed on these characteristics are the effects of a variety of land uses including pasture, cultivation, mechanical forage removal, idle conditions, and burning. All these factors exert profound influences on the plant and animal communities found in these basins (Kantrud et al. 1989).

These wetlands, described as lacustrine basins and palustrine basins (wetlands that lack flowing water), have water regimes that include temporary, seasonal, and semipermanent flooding. Basins with these water regimes constitute about 90 percent of the basins in the Dakotas' Prairie Pothole Region. Heavy spring rainfall and snowmelt followed by periods of low rainfall contribute to dynamic water level fluctuation throughout the region. Temporary and seasonal wetlands are typically smaller than semipermanent wetlands and generally contain water for only a portion of the year. In drought periods, these short-term wetlands may stay dry for as long as 10–20 years. Because they usually contain water in the spring when farmers are planting crops and dry during the summer, they are often looked upon as having no ecological value and are consequently drained (Leitch 1989). However, it is the small, shallow, and frequently dry characteristics that make these wetlands a preferred habitat for many species of wetland-dependent wildlife (Kantrud and Stewart 1984; Niemuth et al. 2006). Because they are among the earliest wetlands to warm in the spring and contain an abundance of flooded vegetation, these early wetlands provide an abundance of breeding and foraging habitat for wildlife and breeding duck pairs (Swanson and Duebbert 1989; van der Valk 2005). Abundance of temporary and seasonal wetlands throughout the

Prairie Pothole Region is looked upon as one of the primary draws to the area for waterfowl. According to Ron Reynolds of the Service's HAPET (Habitat and Population Evaluation Team), it is estimated that every ten 1-acre wetlands can predictably support 20 duck pairs; in contrast, one 10-acre wetland likely supports only seven duck pairs. The dense populations of aquatic invertebrates in these wetlands have evolved to adapt to annual and long-term changes in the water quality of these microhabitats; other hydrophilic species, such as fish, are precluded by the periods of desiccation from inhabiting these wetlands.

Those aquatic features that are stable in depth typically support some fish species and rarely freeze to the bottom. The few deeper lakes, typically known as "kettle lakes," were formed when subsurface glacial ice blocks were left as the glaciers retreated. When the ice blocks melted, the surrounding glacial debris collapsed, leaving distinctive, steep-sided lakes. Plant life and fish populations that normally fluctuate in Prairie Pothole Region wetlands are stable in this lake type. Cowardin et al. (1979) defines the wetland subsystems, classes, and subclasses that occur in these basins and provides a useful reference to their geology, climate, hydrology, and soils.

The original density of wetlands in the Prairie Pothole Region is thought to have been about 80 wetlands per square mile before European settlement. Since that time, about 37 percent of South Dakota's wetlands have been drained for agriculture or development, with 20,000 acres being lost each year in the Prairie Pothole Region (Dahl 2000). Because the Prairie Pothole Region is a major world supplier of cereal grains, wetlands in the region are often drained for crop production or otherwise cropped when water conditions permit.

### **Water Quality**

Some wetland basins function as groundwater recharge areas; such basins tend to be temporarily or seasonally flooded. These basins hold water for only a few months each year, and the water is generally low in dissolved solids. Some basins are through-flow systems with respect to groundwater; that is, groundwater flows in through parts of their bed while other parts recharge groundwater. Through-flow basins hold water over longer periods, and the water tends to have higher concentrations of dissolved solids. Some basins serve only as discharge areas for groundwater. Lakes that receive discharge from both regional and local groundwater flow systems and do not lose water to seepage or surface outflow are highly saline (Kantrud et al. 1989).

Human-related disturbance such as drainage and cultivation are the most extreme disturbances in most prairie wetlands in North and South Dakota. In some

instances, fill (earth or rocks) or use for solid-waste disposal has destroyed the basins (Kantrud et al. 1989).

### **Water Rights**

The Western States tend to be semiarid to arid, while the Eastern States are typically wetter. This change in precipitation patterns falls along the 100th meridian, and South Dakota offers a vivid snapshot of the differences between the western and eastern United States. Anyone driving across South Dakota can see a striking difference between the eastern and western parts of the State.

Like other resources, water becomes more valuable as its availability decreases. Consequently, as is often the case where agriculture is an important component of the economic base, water rights assume tremendous importance. Thus, climate played a major role in shaping South Dakota's water rights laws.

South Dakota, like many of the Western States, needed a water management system that would equitably distribute often scarce water resources. In the eastern United States, where water is more plentiful, a riparian water use system developed. Under such a system, users have the right to make reasonable use of the water accessible to them. However, in the Western States, a system developed based on the "Doctrine of Prior Appropriation." This prior appropriation system allows water users to construct works to move water over long distances to where the water is needed and provides for assignment of a water use priority date. "First in time, first in right" became a common identifier for this priority date-based system, since the most senior water right holders have first claim on any water available. Because of the considerable investment involved in constructing works to move water long distances, protecting that investment has been a priority since the advent of such projects. The doctrine of prior appropriation became the means to protect water users and continues to be South Dakota's method of managing its water resources.

In 1889 South Dakota became the 40th State, but the doctrine of prior appropriation actually predates South Dakota's statehood. The Dakota territorial legislature enacted legislation in 1881 establishing a procedure to "locate" surface water rights. In 1955, legislation was enacted to make ground water, as well as surface water, subject to the doctrine of prior appropriation.

In 1972 another important provision concerning management of ground water was added to the State's water right laws. This provision prevents withdrawals of ground water in excess of the average estimated annual recharge to the ground water source. In other words, users cannot draw more water out of the aquifer than the average amount needed to refill the aquifer each year. This provision ensures that ground water supplies will be available in perpetuity to all domestic water users and everyone with a water right permit.

Many Western States do not provide this protection and, consequently, ground water supplies are being depleted.

Through the years many other changes to the water rights laws have been made to protect and improve management of water resources. However, even with these changes, the same underlying principles implemented at the beginning of the 20th century are still in place in the 21st century.

The South Dakota Department of Environment and Natural Resources requires a water right license for every impoundment or wetland restoration having more than 25 acre-feet of storage. Individual licenses are detailed below. If the impounded storage is less than 25 acre-feet, a location notice is required. Location notices for all three districts are provided in appendix E.

#### **Huron WMD**

The Huron WMD holds four water licenses issued by the South Dakota Department of Environment and Natural Resources for impoundments of more than 25 acre-feet at the primary spillway elevation.

- Water Right License No. 5794-3 allows 560 acre-feet of water storage from runoff. The license also allows a sufficient amount of water to maintain the water level to the outlet elevation of 1,346 feet for fish and wildlife production purposes at Bauer WPA. The priority date is October 18, 1993.
- Water Right License No. 6130-3 is a vested water right that allows storage of 11 acre-feet of water storage from Cain Creek and runoff. The license also allows a sufficient amount of water to maintain the water level to the outlet elevation of 1,288 feet for fish and wildlife propagation. The priority date is December 31, 1939.
- Water Right License No. 6854-3 is for the Cowan Project in Hyde County. The permit allows 260 acre-feet of water storage from runoff for fish and wildlife propagation as well as for stock water purposes. The priority date is March 30, 2007.
- Water Right License No. 6855-3 is for the Harter Pond Project in Hyde County. The permit allows 181 acre-feet of water storage from runoff for fish and wildlife propagation as well as stock water purposes. The priority date is March 30, 2007.

#### **Madison WMD**

The Madison WMD holds water right licenses for several WPAs and private property with Service Easements issued by the South Dakota Department of Environment and Natural Resources.

- Water License No. 856-3 is a vested water right for Buffalo Lake WPA in Minnehaha County that allows 310 acre-feet of storage from runoff. It also allows a sufficient amount of water to maintain the

water level to the outlet elevation of 1,648 feet for public recreation purposes. The priority date is November 2, 1889.

- Water Right License No. 5707-3 increased the outlet elevation of Buffalo Lake to 1,650 feet, increasing the storage by 641 acre-feet to 951 acre-feet for fish and wildlife propagation purposes; it also allows maintenance of the water level at the new elevation. The priority date for the increased amount is September 2, 1992.
- Water Right License No. 5961-3 allows 145 acre-feet of water storage plus 55 acre-feet of seasonal use at the North Unit of Minnehaha County Easement 92X, and 8 acre-feet of water storage plus 4 acre-feet of seasonal use at the South Unit for fish and wildlife purposes. The priority date is October 15, 1996.
- Water Right License No. 5714-3 allows storage of 64 acre-feet plus 108 acre-feet of seasonal use at Hamlin County Easement 171X. Sufficient water also needs to be allowed to maintain the outlet elevation of 1,781.6 feet for fish and wildlife as well as stock water purposes. The priority date is September 28, 1992.
- Water Right License No. 6369-3 allows storage of 82.12 acre-feet at Hamlin County Easement 190X for fish and wildlife purposes. The priority date is October 25, 2002.
- Water Right License No. 6279-3 allows storage of 110 acre-feet of water at Moody County Easement 70X for fish and wildlife purposes. It also allows sufficient water to maintain the outlet elevation at its fullest capacity. The priority date is August 9, 2001.
- Water Right License No. 5945-3 allows storage of 477 acre-feet of water plus 1,078 acre-feet of seasonal use at Dry Lake WPA in Brookings County to maintain the outlet elevation of 1,721 feet for fish and wildlife purposes. The priority date is June 24, 1996.
- Water Right License No. 5882-3 allows storage of 37.1 acre-feet of water plus 33.9 acre-feet seasonal use at Eriksrud WPA to maintain the outlet elevation of 1,749.5 feet for fish and wildlife purposes. The priority date is August 30, 1995.
- Water Right License No. 5855-3 allows storage of 49.5 acre-feet of water plus 54 acre-feet of seasonal use at Dry Lake WPA to maintain the outlet elevation of 1,736 for fish and wildlife purposes. The priority date is March 13, 1995.
- Water Right License No. 5531-3 allows storage of 106.3 acre-feet of water plus 93.4 acre-feet of seasonal use at Pickering WPA to maintain the outlet elevation of 1,717 feet for fish and wildlife purposes. The priority date is March 29, 1991.

**Table 4. Prairie decline in South Dakota.**

<i>Prairie type</i>	<i>Historical area (acres)</i>	<i>Present area (acres)</i>	<i>Percent Decline</i>
Mixed-grass	3,954,000	1,186,000	70
Tallgrass	6,425,000	42,420	99

Source: USGS, Northern Prairie Wildlife Research Center

- Water Right License No. 5432-3 allows storage of 125 acre-feet of water plus 65 acre-feet of seasonal use at Kingsbury County Easement 429X to maintain the outlet elevation of 1,703.5 feet for fish and wildlife purposes. The priority date is February 27, 1990.
- Water Right License No. 5938-3 allows storage of 85 acre-feet of water plus 201 acre-feet of seasonal use at Kingsbury County Easement 434X to maintain the outlet elevation of 1,693 feet for fish and wildlife purposes. The priority date is May 23, 1996.
- Water Right License No. 5224-3 allows storage of 257 acre-feet of water at Eilen WPA for fish and wildlife purposes. The priority date is August 24, 1988.

#### **Sand Lake WMD**

- The Sand Lake WMD holds two water licenses issued by the South Dakota Department of Environment and Natural Resources for impoundments of more than 25 acre feet at the primary spillway elevation.
- Water License No. 6052-3 is a vested water right that allows 267 acre-feet of storage from runoff and Dove Creek. It also allows a sufficient amount of water to maintain the water level to the spillway elevation of the dam to provide habitat for fish and wildlife propagation at Zell Lake WPA. The priority date is January 1, 1936.
- Water License No. 5472-3 allows local water runoff to be stored up to 60 acre-feet plus 110 acre-feet of seasonal use for fish and wildlife production on Spink County WPA. The priority date is September 11, 1990.

#### **AIR QUALITY**

Air quality is regulated pursuant to several provisions of the Clean Air Act, including the NAAQS (National Ambient Air Quality Standards) and the Prevention of Significant Deterioration program. The NAAQS establish maximum allowable pollution levels for “criteria pollutants”: particulate matter, ozone, sulfur dioxide, nitrogen dioxide, lead, and carbon dioxide.

South Dakota, a generally rural State, is one of only a handful of States that meets all the NAAQS, or is “in attainment.” Attainment status is based on data collected through an ambient air monitoring network, comprising various sites throughout the State. Although the data are not collected on a county-by-county basis,

data collected in one county is representative of other, similar areas. Despite the operation of energy facilities along South Dakota’s eastern edge of the State, the State boasts some of the cleanest air in the nation.

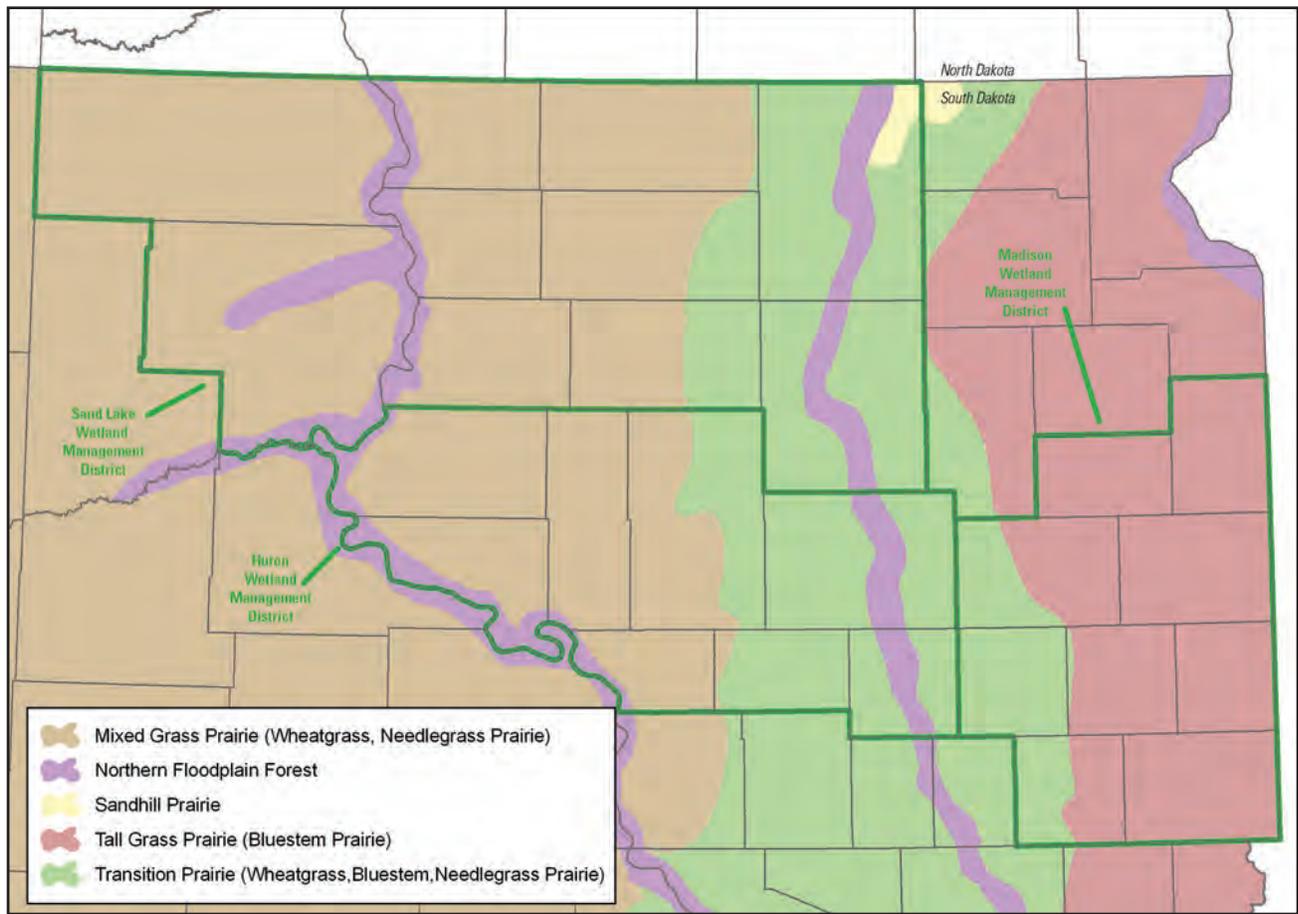
Prescribed burning and wildfires are the two events with the greatest effect on air quality. These activities produce numerous gases, including CO<sub>2</sub> and H<sub>2</sub>O as well as particulate matter. Wildfires are generally exempt from provisions of the Clean Air Act because they are unplanned events. Prescribed fires are planned activities and must therefore comply with the Clean Air Act State Implementation Plan (SIP) requirements. Planning for the use of prescribed fire incorporates management of smoke. The Service will work with the State of South Dakota Department of Environmental and Natural Resources in meeting the SIP for smoke management and will follow any smoke permitting process. The Service identifies sensitive areas and takes precautions to safeguard visitors and local residents. Smoke dispersal is a consideration in determining whether a controlled burn is within prescription. Generally, the fine-grass fuels and small burn size (80–600 acres) generate low volumes of smoke for short durations (4–5 hours).

## **4.2 Biological Resources**

### **VEGETATION COMMUNITIES**

Prairie habitats in South Dakota and throughout the Great Plains have been gaining public interest over the last few years as more people become aware of their decline (table 4). Before the 1870s, prairies covered more than a third of the United States and almost all of South Dakota. What was once a mosaic of grasses and forbs (flowering plants) where bison roamed is now predominantly agricultural land. With the arrival of increasing numbers of settlers in the late 1800s, the landscape started to change and continued to change at such a rate that now only one-half of one percent of historic prairie habitats in the United States remain. The historical distribution of prairie zones in the three-district area is shown in figure 9.

In addition to its importance to wildlife, prairie is crucial for soil and water conservation. Prairie provides a reminder of the nation’s rural and pioneer heritage; it provides recreational activities such as hunting, hiking,



**Figure 9. Distribution of vegetation communities in the three districts, South Dakota.**

and bird watching; and it offers living laboratories for scientific research. Prairie also provides economic benefits through cattle grazing, haying, and native seed harvesting. When prairie is lost, the nation's natural heritage is lost along with a valuable resource (North Dakota Parks and Recreation Department, no date).

### Mixed-Grass Prairie

Mixed-grass prairie is one of the largest ecosystems in North America, with significant areas preserved for natural values in national wildlife refuges, WPAs, State game management areas, and nature preserves (Johnson 2006a). The dominant grass species in the mixed-grass prairie are prairie Junegrass, little bluestem, needle and thread, blue grama, green needlegrass, porcupine grass, prairie cordgrass, northern reedgrass, plains muhly, western wheatgrass, and Kentucky bluegrass (NDGF 2005). The short- and tallgrass prairies intergrade just east of an irregular line that runs from northern Texas through Oklahoma, Kansas, and Nebraska, and then northwest into west-central South Dakota and North Dakota. The perimeter is not well defined because of the array of short-stature, intermediate, and tallgrass species that make up an ecotone between the short- and tallgrass prairies

(Bragg and Steuter 1996). In general, mixed-grass prairie is characterized by the warm-season grasses of the shortgrass prairie to the west and the cool- and warm-season grasses (which grow much taller) to the east. Because of this ecotonal mixing, the number of plant species found in mixed-grass prairies exceeds that in other prairie types. Estimated declines in the areal extent of native mixed-grass prairie range from 30.5 percent in Texas to more than 99.9 percent in Manitoba (Austin 1998).

Mixed-grass prairie in the three-district area is closely associated with the Northwestern Glaciated Plains (ecoregion 42). The hummocky, rolling hills of the Missouri Coteau rise dramatically 150–500 feet above the Drift Plains (ecoregion 46i) and James River Lowlands (ecoregions 46n) to the east. Here, the mixed-grass prairie community supports a high concentration of wetlands—roughly 800,000 basin acres. Alkaline lakes are also more prevalent here. Streams and rivers are nearly absent, as are upland deciduous forests. A considerable amount of native prairie remains, and this area is used primarily for cattle grazing. Areas of reduced slope have been converted to cropland for small grains, sunflowers, corn,

and alfalfa. The mixed-grass prairie of the Missouri Coteau (ecoregion 42a) is known for supporting some of the highest numbers of breeding ducks in North America. Due to the large amount of grassland and wetland that remains or has been restored, this area is especially crucial to many other grassland-endemic species. Much of the Coteau is classified as “good” to “outstanding” for wind energy potential, the development of which could lead to habitat fragmentation. Irrigation and new advances in agricultural production, such as no-till farming in combination with Roundup-Ready corn and soybeans, makes farming of native prairie possible even where it was previously impractical due to rugged terrain.

### Transition Prairie

Transition prairie is found between the more xeric mixed-grass prairie and the mesic tallgrass prairie. Transition prairie is characterized by western wheatgrass, big bluestem, and needlegrasses, representing a mix of influences from both tallgrass and mixed-grass prairies. Transition prairie in the three-district area is closely associated with the Drift Plains, James River Lowlands, Glacial Lake Basins, and Glacial Lake Deltas (ecoregions 46i, 46n, 46c, and 46d, respectively).

Grass species that dominate the tallgrass prairie continue to be present in transition prairie. However, the vegetation is reduced in height, becomes less dense, and takes on a distinctly more xeric impress. More mesic species do not extend as far up the slopes. These changes result from gradually increasing unfavorable water relations as the vegetation of true grasses gives way to that of mixed-grass prairie. Big bluestem and switchgrass are much less widely distributed, indicating less favorable conditions for growth.

### Tallgrass Prairie

Tallgrass prairie is the wettest of the grassland types and is largely characterized by sod-forming bunchgrasses. Like other grasslands, species composition of tallgrass prairie varies geographically (Sims 1988).

Grassland groupings of the tallgrass prairie are (1) bluestem prairie from southern Manitoba through eastern North Dakota and western Minnesota south to eastern Oklahoma, and (2) wheatgrass, bluestem, and needlegrass prairie from south-central Canada through east-central North Dakota and South Dakota to southern Nebraska. The dominant grass species in these areas are big bluestem, little bluestem, switchgrass, Indiangrass, prairie dropseed, slender wheatgrass, porcupine grass, mat muhly, fescue sedge, and meadow sedge.

Since 1830, there have been estimated declines of 82.6–99 percent in tallgrass prairie in specific States and provinces. These declines exceed those reported for any other major ecological community in North America (Samson et al. 1998). Less than 15 percent of the tallgrass prairie in South Dakota remains intact, and the nationwide rate is no better (Samson and Knopf 1994). No other major ecosystem on the North American continent has been so fully altered by human activities (Domek 1998).

Prairie landscapes are shaped by disturbance regimes such as drought, fire, and grazing. Prior to European settlement, the agents of those regimes were wildland fire and bison. Fire probably played a larger role than did bison in shaping the mosaic of vegetation communities. Fire swept through the area every 3–5 years, burning plant material, recycling nutrients into the soil, and stimulating diverse, healthy plant growth (Domek 1998). Tallgrass prairie and associated wetlands in the three-district area were historically found predominantly in the eastern portion of South Dakota. By the 20th century, much of the tallgrass prairie had been converted to farmland; few tracts of native vegetation remain. Farmland with woodlots and shelterbelt plantings is now prevalent.

### Wetland Habitat

A wide variety of aquatic plants occur in prairie wetlands. However, the vegetative communities of prairie wetlands are determined by the fluctuating hydrologic



*A male bobolink surveys its grassland habitat.*



*A sora forages in wetland habitat.*



Mason Sieges/USFWS

*Canada thistle is a widespread invasive on district lands.*

regime, which creates a wet-dry cycle in wetlands (Kantrud et al. 1989). As wetlands pass through the four stages of the wet-dry cycle—dry marsh, regenerating marsh, lake marsh, and degenerating marsh—various environmental conditions cause specific vegetation expression to occur. Each stage is determined by the amount of water present, ranging from drought to full pool conditions. As the wetlands cycle through these stages, a variety of diverse aquatic plant life expresses due to the environmental factors triggering germination in the seed bank. Different aquatic plants occur at the various stages of the wetland cycle.

Several basic zones in prairie wetlands—wet meadow, shallow marsh, deep marsh, open water, and alkali—also affect the species of aquatic plants that are expressed. Wet meadow is the transition of upland into wetland and is characterized by grasses, fine sedges, and forbs. Shallow marsh is characterized by mid-height grasses and coarse sedges. Deep marsh is characterized by tall coarse herbaceous plants (such as cattail and bulrush species). The open water zone can be occupied by submergent or floating aquatic plants. Alkali zones are often devoid of vegetation or contain salt-tolerant species such as widgeongrass.

Most of South Dakota's wetlands are prairie potholes, which provide nesting and feeding habitat for migratory waterfowl and wading birds. About one-half the nation's duck population originates in the Prairie Pothole Region of South Dakota and other prairie States. Prairie potholes, or sloughs, are water-holding depressions of glacial origin that occur in 300,000 square miles of prairies in north-central United States

and south-central Canada. These potholes provide the most productive wetland habitat for waterfowl in North America. Although comprising only 10% of the continental waterfowl breeding, the Prairie Pothole Region produces about 50% of the duck crop in an average year and much more in bumper years. Potholes also furnish water for other wildlife and livestock (USGS 2007).

### INVASIVE PLANTS

The South Dakota Weed and Pest Control Commission has designated certain weeds as noxious because of their difficulty to control and the costs associated with the loss of agricultural production (table 5). All the State-listed noxious weeds were introduced from other ecosystems and have flourished in the absence of natural controls. Control of State-listed noxious weeds—whether chemical, mechanical, biological, or fire—is a priority for the Service. However, many other invasive plants also threaten wildlife habitat and interfere with the Service's management objectives. Weeds may be designated as locally noxious upon request from counties and with approval from the South Dakota Weed and Pest Control Commission. Local noxious weeds have the following characteristics:

- The weed is biennial, perennial, or a pernicious annual.
- The weed is capable of spreading rapidly.
- The weed is not controllable without special preventative or management practices.

**Table 5. State-listed and local noxious weeds and their distribution in the South Dakota Wetland.**

<i>State noxious weeds</i>	<i>Scientific name</i>	<i>Distribution by county</i>
Canada thistle	<i>Cirsium arvense</i>	Widespread
Leafy spurge	<i>Euphorbia esula</i>	Widespread
Perennial sow thistle	<i>Sonchus arvensis</i>	Widespread
Hoary cress	<i>Cardaria draba</i>	Hand, Hyde, Minnehaha
Russian knapweed	<i>Centaurea repens</i>	Jerauld, Minnehaha, Spink
Purple loosestrife	<i>Lythrum salicaria</i>	Edmunds, Lake, Minnehaha, Sanborn, Spink
Salt Cedar	<i>Tamarix aphylla</i> , <i>T. chinensis</i> , <i>T. gallica</i> , <i>T. parviflora</i> and <i>T. ramosissima</i>	Edmunds, Faulk, Spink
<i>Local noxious weeds</i>	<i>Scientific name</i>	<i>Distribution by county</i>
Absinth wormwood	<i>Artemisia absinthium</i>	Widespread
Musk thistle	<i>Carduus nutans</i>	Widespread
Plumeless thistle	<i>Carduus acanthoides</i>	Widespread
Bull thistle	<i>Cirsium vulgare</i>	McCook
Field bindweed	<i>Convolvulus arvensis</i>	Beadle, Buffalo, Campbell, Edmunds, Hamlin, Hughes, Kingsbury, Lake, McPherson, Potter, Sanborn
Common mullein	<i>Verbascum thapsus</i>	Beadle, Hyde
Yellow toadflax	<i>Linaria vulgaris</i>	Brown, Edmunds, Hyde, Lake, McPherson, Moody
Houndstongue	<i>Cynoglossum officinale</i>	Hyde

- The weed is capable of materially reducing production of crops and livestock.
- The weed is capable of decreasing the value of the land.

District staff addresses these species on a case-by-case basis, depending on available money, time, and resources.

Invasive plants on Service lands have reduced wildlife habitat and biodiversity. The presence of invasive plants can alter the functioning of ecosystems by degrading wildlife habitat; displacing native species; and changing carrying capacity through reduced forage production, lower plant diversity, and increased soil erosion and sedimentation. Such plants are not only problematic on the Service's fee-title lands; they also infest rangelands and croplands across South Dakota. The spread of invasive plants occurs by root spread or by seed dispersal, with wind, water, humans, equipment, and animals acting as transport mechanisms.

## FIRE

Prior to European settlement, wildfires and grazing (primarily by bison, prairie dogs, and insects) were the primary ecological disturbances that revitalized grasslands. Lightning and Native Americans caused ignitions, with most wildfires likely occurring during summer and fall. Depending on weather conditions, a single wildfire might burn thousands of acres, creating a mosaic of burned, unburned, and grazed areas.

Historical fire frequency was probably highly variable but has decreased since settlement (Umbanhowar 1996); however, little information is available on the presettlement occurrence of fire in the three districts. Evidence of fire return intervals in the mixed-grass prairie suggests about every 5–10 years in the moist portions and around 25 years on dry portions (Wright and Bailey 1980; Frost 1998). In general, during dry periods in areas where precipitation is limited, such as the western and central grasslands, a long-term decline in grass production occurs when burning is more frequent than every 5–10 years. This fire frequency may be best for natural fire management of grasslands, such as the short- or mixed-grass prairies, although



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Prescribed fire is an important tool to manage the health of grassland ecosystems.

fire exclusion may be best for other purposes (Bragg 1995). Tallgrass prairie tends to have a shorter fire return interval than mixed-grass prairie. Evidence suggests roughly a 3–7 year fire return interval for most of the tallgrass prairie.

After settlement by Europeans, wildfires were suppressed. Today, most local fire departments and area ranchers still aggressively suppress wildfires. It is also the districts' policy to suppress all wildfires or, when appropriate, to manage wildfires for multiple objectives on Service lands. The fire management program for the three districts will follow applicable laws; DOI and Service policies; and guidance established at national, regional, and local levels.

The National Wildfire Coordinating Group currently recognizes two forms of wildland fire: wildfire and prescribed fire. A wildfire is an unplanned ignition, and a prescribed fire is a planned ignition. Wildfires are further divided into two categories based on ignition source: natural (typically lightning) and human. The management response for naturally occurring wildfires can include multiple objectives, whereas human-caused wildfires must be suppressed. Managing for multiple objectives means that different portions of a naturally occurring wildfire can be managed differently. For example, one portion of the wildfire may be suppressed while another portion, providing a benefit that contributes to attainment of refuge goals, is allowed to burn. However, the districts have chosen suppression as the management response to all wildfires. Suppression tactics chosen for each wildfire are at the discretion of the incident commander and the refuge manager, and can range from aggressive direct attack to surveillance or monitoring.

District staff utilizes prescribed fire to simulate the historical influence fire had on plant communities. Burning removes layers of residual cover that can reduce plant species diversity and increase a wildfire's resistance to control. Prescribed fire is currently used in all habitat types found within the districts.

Even though prescribed burning can occur at any time of year, most prescribed fires are currently applied in spring, early summer, and into fall, depending on the prescribed fire's objectives and the associated effects on flora and fauna. Spring burning is often preferred because it presents opportunities to manage invasive cool-season grasses, open up shorelines and vegetation-choked wetlands, and provide areas of green browse attractive to migratory waterfowl. Prescribed fire has been increasingly implemented during the last 15 years; since 2001, the districts have treated about 28,900 acres.

Prescribed burning and grazing can be used in concert to reduce the accumulation of organic litter. Burning creates a "flush" growth of new vegetation, which is then grazed to extend treatment of problem plants such as Kentucky bluegrass and smooth

brome. Invasive plants such as Canada thistle, absinth wormwood, and leafy spurge can be similarly managed. The districts have occasionally used this management strategy, which shows promise for more frequent use in the future. Overall guidance for use of prescribed fire and management of wildfires in the three districts is presented in chapter 6 as well as in the fire management plans for the districts.

## GRAZING

Grazing is an important agent in shaping the structure and composition of grassland communities. Herbivores such as bison, elk, deer, pronghorn, and black-tailed prairie dog interact with soils, plants, other animals, and other processes to produce distinctive successional patterns in the northern Great Plains landscape at multiple scales.

Plants on the prairie evolved with some form of herbivory. Most plant species have growing points at or near the ground surface, allowing the plant to be grazed without killing it. Some contain bitter or toxic substances that cause animals to avoid grazing on them. Others have spines to cause injury to grazing animals' mouths. Consequently, to maintain native plant associations, it is essential to maintain the processes—such as grazing—under which the plants evolved.

It is likely that bison herds historically spent a considerable amount of time grazing native prairie in the three-district area. Their grazing, trampling, trailing, and related activities likely had a significant effect on the development and maintenance of certain plant communities. Free-ranging bison and elk are no longer present in the districts. Instead, district staff works with local ranchers to mimic natural disturbances through livestock grazing.

Grazing can be prescribed during periods when specific targeted plants are most palatable to livestock. Seasonal grazing of the uplands stresses the invasive cool-season grasses and favors native grasses and forbs. Grazing in wetland habitats reduces accumulations of



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*The burrowing owl is a South Dakota Priority Species and a Region 6 Bird of Conservation Concern.*

organic litter at the surface; excessive organic litter often favors invasive plants such as Canada thistle. Grazing can also be used as part of an IPM (integrated pest management) program. Follow-up treatments tend to be easier to complete and are more effective when they follow grazing.

## WILDLIFE

This section describes the birds and mammals that are common in district lands, strategic planning for waterfowl, and threatened and endangered species that have the potential to occur in the districts.

### Birds

Grasslands and wetlands dominated by a rich assortment of native grasses, sedges, and forbs occur throughout the districts. This diverse grassland landscape supports an impressive concentration of waterfowl, shorebirds, and other open-water bird species. Many species of raptors and songbirds breed and are widely distributed on protected district lands, making South Dakota a primary destination for outdoor enthusiasts. Bird species that occur in the districts are listed in appendix G.

The 1988 amendment to the Fish and Wildlife Conservation Act mandates that the Service “identify species, subspecies, and populations of all migratory nongame birds that, without additional conservation actions, are likely to become candidates for listing under the Endangered Species Act (ESA) of 1973.” BCC (Birds of Conservation Concern) is the most recent effort to carry out this mandate (USFWS 2008a). The overall goal of this report is to accurately identify the migratory and nonmigratory bird species (beyond those federally listed as threatened or endangered) that represent our highest conservation priorities. Several categories of bird species are considered for inclusion on lists in this report: nongame birds; gamebirds without hunting seasons; subsistence-hunted nongame birds in Alaska; and ESA candidate, proposed, and recently delisted species. Bird species are included on the lists on the basis of several factors; these include population trends, threats, distribution, abundance, and relative density.

The goal is to prevent or remove the need for additional ESA bird listings by implementing proactive management and conservation actions among Federal, State, tribal, and private partners. BCC lists should be consulted in accordance with Executive Order 13186, “Responsibilities of Federal Agencies to Protect Migratory Birds.” The 2008 BCC report should also be used to develop research, monitoring, and management initiatives. By focusing attention on the highest priority species, the report is intended to promote greater study and protection of the habitats and ecological communities upon which these species depend, thereby contributing to healthy avian populations and



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*A badger relaxes in the sun.*

communities. Table 6 lists the species that have been identified as birds of conservation concern or priority species for this region. The districts have developed a list of focal species—distilled from the larger list of species shown in table 6—that they are best positioned to help protect and maintain on the basis of the species’ geographic ranges and specialized habitats (table 7).

### Mammals

There can be little doubt that the activities of wild American bison, which were extirpated from the Prairie Pothole Region of South Dakota in the 19th century, had a major influence on prairie uplands and wetlands in presettlement times. Unfortunately, there is no documentation of how wetlands were affected by the feeding, drinking, dusting, or other activities of millions of bison as they roamed the prairies. Other grassland mammals extirpated from the area are grizzly bear, kit fox, and plains wolf. Currently, the suite of mammal species occurring in the districts includes coyote, red fox, badger, raccoon, striped skunk, mink, long-tailed weasel, white-tailed deer, mule deer, white-tailed jackrabbit, eastern cottontail, muskrat, thirteen-lined ground squirrel, deer mouse, prairie vole, and meadow vole. In addition to these common species, moose, elk, and pronghorn are occasionally sighted on or adjacent to district lands.

### Threatened and Endangered Species

Laws passed in the late 1960s gave some attention to endangered species; however, it was not until ESA was passed in 1973 that significant protection was granted to rare species. This landmark law, considered by some the most significant environmental law ever passed, has been amended and reauthorized by Congress on numerous occasions, most recently in 1988. The Service administers the law for all inland species and certain marine species. When Congress authorized ESA, it declared that species of “fish, wildlife, and plants are of aesthetic, ecological, educational, historical, recreational, and scientific value to the nation and its

**Table 6. Birds of Conservation Concern or Priority Species.**

<i>Species</i>	<i>Range</i>	<i>Prairie Potholes Birds of Conservation Concern (USFWS 2008a)</i>	<i>Region 6 Birds of Conservation Concern (USFWS 2008a)</i>	<i>South Dakota Priority Species (Bakker 2005)</i>	<i>Threatened or Endangered Species</i>
American bittern	All three districts	X	X	X	
Bald eagle	All three districts	X	X		
Baird's sparrow	Sand Lake	X	X	X	
Bell's vireo	All three districts		X		
Black tern	All three districts	X		X	
Black-billed cuckoo	Sand Lake/Madison	X	X	X	
Black-crowned night heron	All three districts			X	
Bobolink	All three districts				
Burrowing owl	All three districts		X	X	
Chestnut-collared longspur	All three districts	X	X	X	
Dickeissel	All three districts	X			
Ferruginous hawk	Huron/Sand Lake		X	X	
Franklin's gull	All three districts			X	
Golden eagle	Huron/Sand Lake		X		
Grasshopper sparrow	All three districts	X	X	X	
Greater prairie-chicken	All three districts			X	
Horned grebe	Sand Lake	X	X	X	
Lark bunting	Huron/Sand Lake			X	
Le Conte's sparrow	Sand Lake			X	
Least bittern	All three districts	X	X		
Least tern	Huron/Sand Lake				X
Loggerhead shrike	All three districts		X		
Long-billed curlew	Huron/Sand Lake	X	X		
Marbled godwit	All three districts	X	X	X	
Nelson's sharp-tailed sparrow	Sand Lake	X		X	
Northern harrier	All three districts			X	
Piping plover	All three districts				X
Red-headed woodpecker	All three districts	X	X		
Savannah sparrow	All three districts			X	
Sedge wren	All three districts				
Sharp-tailed grouse	Huron/Sand Lake			X	
Short-eared owl	All three districts	X	X	X	
Sprague's pipit	Sand Lake	X	X		
Swainson's hawk	All three districts	X		X	
Upland sandpiper	All three districts	X	X	X	
Virginia rail	All three districts			X	
Western meadowlark	All three districts			X	
Willet	All three districts			X	
Willow flycatcher	All three districts		X		
Wilson's phalarope	All three districts			X	

**Table 7. Selected focal grassland bird species by wetland management district.**

<i>Species</i>	<i>Huron</i>	<i>Madison</i>	<i>Sand Lake</i>
Baird's sparrow			X
Blue-winged teal	X	X	X
Bobolink		X	X
Chestnut-collared longspur	X		X
Gadwall	X	X	X
Grasshopper sparrow	X	X	X
Greater prairie-chicken	X		
Mallard	X	X	X
Marbled godwit	X	X	X
Northern harrier		X	
Northern pintail	X	X	X
Northern shoveler	X	X	X
Short-eared owl	X		
Upland sandpiper	X	X	X
Willet			X
Wilson's phalarope		X	

people.” The purpose of ESA is to provide a means whereby endangered species and their ecosystems may be conserved. The intent of the act is not merely to list species as endangered or threatened, but rather to recover the populations of these species to a point where they can be removed from the list.

Occurrences of eight federally listed species and two candidate species (Dakota skipper and Sprague's pipit) have been documented within at least one of the three districts. These species are listed in table 8 and described below.

#### **American Burying Beetle**

Although the Service lists South Dakota as a State where burying beetle is known to occur, the last documented occurrence in the districts was in Brookings County in 1945. Habitat associations with historical collections of burying beetle are not well defined. It is thought that carrion availability is more important than vegetation or soils to the species' occurrence.

#### **Dakota Skipper**

Dakota skippers occur in the Sand and Lake Madison WMDs. Dakota skipper is a small butterfly with a 1-inch wingspan. It has a thick body and a faster and more powerful flight than most butterflies. Skippers are likely to occur only in scattered remnants of high-quality native prairie across a vast area of grassland in the north-central United States and south-central Canada. The most significant remaining populations of Dakota skipper are in western Minnesota, north-eastern South Dakota, north-central North Dakota, and southern Manitoba. The species' current distribution straddles the border between tallgrass and

mixed-grass prairie; it occurs in two types of habitat (USFWS 2002a):

- Flat, moist native bluestem prairie in which three species of wildflowers are usually present—stage-wood lily, harebell, and smooth camas.
- Upland (dry) prairie that is often on ridges and hillsides; bluestem grasses and needlegrasses dominate these habitats and three wildflowers are typically present in quality sites—pale purple, upright coneflowers, and blanketflower.

Dakota skipper populations have declined due to widespread conversion of native prairie for agricultural and other uses. This has left the remaining skipper populations isolated from one another in relatively small areas of remnant native prairie. In addition, many of the habitats where the species persists are threatened by overgrazing, conversion to cultivated agriculture, inappropriate fire management and herbicide use, woody plant invasion, road construction, gravel mining, invasive plant species, and flooding.

#### **Topeka Shiner**

Topeka shiner habitat is characterized as small to mid-sized streams of the central prairie regions of the United States with relatively high water quality and cool to moderate temperatures. Many of these streams exhibit perennial flow, although some become intermittent during summer or periods of prolonged drought.

Few historical data are available regarding the distribution of Topeka shiner in South Dakota; at the time this species was proposed for listing in 1997, only five locations were known. Since then, several

**Table 8. Listed species (based on published population data).**

<i>Status</i>	<i>Species/listing name</i>
E	American burying beetle ( <i>Nicrophorus americanus</i> )
C	Dakota skipper ( <i>Hesperia dacotae</i> )
E	Topeka shiner ( <i>Notropis topeka</i> [=tristis])
E	Whooping crane ( <i>Grus americana</i> )—except where EXPN
E	Eskimo curlew ( <i>Numenius borealis</i> )
T	Piping plover ( <i>Charadrius melodus</i> )—except Great Lakes watershed
E	Least tern ( <i>Sterna antillarum</i> )—interior DPS
C	Sprague's pipit ( <i>Anthus spragueii</i> )
E	Black-footed ferret ( <i>Mustela nigripes</i> )—entire population, except where EXPN
E	Gray wolf ( <i>Canis lupus</i> )—lower 48 States, except where delisted or EXPN. Mexico.

*E* = listed as endangered under ESA

*T* = listed as threatened under ESA

*C* = candidate for listing under ESA

*EXPN* = experimental nonessential population

*DPS* = distinct population segment

surveys conducted throughout South Dakota found that the species was more widespread than previously thought. In its Final Ruling on Topeka shiner critical habitat (69 Federal Register 44736, July 27, 2004), the Service elected to exclude from designation all previously proposed critical habitat in South Dakota under authority of ESA section 4(b)(2). As a result, several agencies partnered to develop a plan for the shiner's recovery in South Dakota. Current measures to protect the species defer to this plan.

#### **Whooping Crane**

Whooping crane is one of the most endangered birds in North America. According to Tom Stehn, Service Whooping Crane Coordinator, as of 2010 the only naturally occurring wild, migratory population in the world numbered approximately 290 individuals. Each spring and fall, whooping cranes use wetlands and agricultural fields in the Huron and Sand Lake WMDs as migratory stopover areas en route to their summer and winter grounds.

#### **Eskimo Curlew**

Although the Service lists South Dakota as a State where Eskimo curlew is known to occur, no specific location information is available.

#### **Piping Plover**

Designated critical habitat for this threatened species is defined as prairie alkali wetlands and surrounding shoreline, extending into upland habitat to 200 feet outside the high water mark; river channels and associated sandbars and islands; reservoirs and their sparsely vegetated shorelines, peninsulas, and islands; and inland lakes and their sparsely vegetated shorelines and peninsulas.

Historic data on the distribution of northern Great Plains piping plovers are scarce, with regular surveying

efforts beginning after 1980. More recent breeding records exist for counties along the Missouri River, as well as Codington, Day, and Miner Counties in South Dakota (South Dakota Ornithologists' Union 1991).

According to C. D. Kruse of the U.S. Army Corps of Engineers, nesting in South Dakota has generally been limited to the Missouri River, primarily below the Gavins Point and Fort Randall Dams and on Lake Oahe. Piping plovers have occasionally nested on Lake Sharpe (Missouri River); they have been sighted on Lake Francis Case (Missouri River) during the nesting season, but nesting has not been documented. Along these rivers, plovers often nest near interior least terns (federally listed as endangered).

Of the roughly 6,000 piping plovers left in the world, about half breed in the northern Great Plains. This population is declining between 6 and 12 percent annually (Larson et al. 2002; Plissner and Haig 2000; Ryan et al. 1993), and is expected to become extinct in 50–100 years unless significant conservation activities are initiated. The decline and poor prognosis led to the listing of this population in the 1980s as threatened in the United States and endangered in Canada.

#### **Interior Least Tern**

The Service lists the Sand Lake WMD as an area where the least tern is known to occur. This tern, the smallest member of its family, arrives on its breeding grounds in early May. Interior least terns nest in small, loosely defined groups on barren beaches of sand, gravel, or shells; on dry mudflats and salt-encrusted soils (salt flats); and at sand and gravel pits along rivers. Nesting success depends on the presence of bare or nearly barren sandbars, favorable water levels during nesting, and abundant food. The chicks leave the nest only a few days after hatching, but the adults continue to care for them, leading them to shelter in



Ryan Hagerty/USFWS

*The whooping crane is a listed species.*

nearby grasses and bringing them food. Terns hover over and dive into standing or flowing water to catch small fish. The interior least tern was federally listed as endangered in 1985, primarily due to the loss of nesting habitat as a result of dramatic alterations (channelization and impoundment) of important river systems. Water level fluctuations, vegetation of nesting habitat, and disturbance (from people, pets, predators, and livestock) continue to jeopardize nesting success.

### **Sprague's Pipit**

Once common, the Sprague's pipit has now declined drastically. Surveys have found a long-term (approximately 40-year) population decline of approximately 3.9 percent annually. Conversion of native grasslands to agriculture probably significantly reduced the total global population of Sprague's pipit to current levels. Populations are still threatened by the loss and conversion of breeding habitat to agriculture and human development. Overgrazing by cattle and the invasion by exotic grasses have further reduced the quality of much of the species' breeding habitat. In addition, loss, conversion, fragmentation, and degradation of grasslands on the pipit's wintering grounds are continuing threats.

The Sprague's pipit is one of the few endemic species to the North American grasslands, requiring grassland habitat for both breeding and wintering. The species' breeding range includes parts of Montana, North Dakota, South Dakota, and Minnesota. During the breeding season, Sprague's pipits are most common in relatively large patches of prairie for nesting (estimated at between 170–776 acres), and thus may

be area sensitive. Although they use exotic vegetation, they are significantly more abundant in, and prefer, native prairie. They avoid non-prairie features in the landscape, so the impact of an object (for example, an oil and gas well or a wind turbine) is much larger than the actual footprint of the feature. Energy development is increasing rapidly throughout the breeding range of the Sprague's pipit, a trend that is expected to continue.

The male has a high breeding flight display that can last up to 3 hours. On the ground, Sprague's pipits have very secretive behavior, landing several meters away from the nest and approaching on foot. Sprague's Pipits are one of the least-studied birds in North America, in part due to their elusive behavior and habit of singing high above the ground.

The Service has determined that the Sprague's pipit, a small grassland bird, warrants protection under the ESA, but that listing the species is precluded by the need to address other listing actions of higher priority. The Sprague's pipit will be classified as a candidate species until a listing proposal can be prepared. The Service has completed a comprehensive status review—known as a 12-month finding—and determined that there is sufficient scientific and commercial data to propose listing the species as threatened or endangered throughout its range due to loss of habitat and the inadequacy of existing regulations to protect the habitat. However, the districts have chosen to postpone developing a species-specific objective for the Sprague's pipit until a formal conservation strategy and guidelines for Sprague's pipit management can be developed.

**Black-Footed Ferret**

It is assumed that ferrets occurred in association with prairie dog colonies—likely including portions of the three-district area. However, the most recent documented observation of wild black-footed ferrets in the vicinity was west of the Missouri River in 1974.

**Gray Wolf**

Gray wolves once lived in much of the contiguous United States. They were only absent from a portion of California, the southwest corner of Arizona, and the red wolf range in the southeastern United States. By 1974, when gray wolf was listed as an endangered species, the species' breeding range had been reduced to a small corner of northeastern Minnesota and Isle Royale, Michigan. Individual wolves were periodically observed in the West, but there were no breeding packs. Recovery efforts have since restored the species to some areas of its historic range, including portions of the Southwest, the Rocky Mountains, and the western Great Lakes Region. No records exist for South Dakota.

The Western Great Lakes DPS (Distinct Population Segment) has been proposed for delisting.

## 4.3 Cultural Resources

Humans have occupied central North America for more than 12,000 years and have left a diverse cultural material legacy on the landscape. Several researchers have summarized our understanding of the prehistory and history of the region (Bonnichsen et al. 1987; Gregg et al. 1996; Schneider 1982; SHSND 1990; Winham and Hannus 1989; Wood 1998), and only a brief review will be provided here. The following summary is adapted from Michael A. Jackson and Dennis L. Toom's 1999 report, "Cultural Resources Overview Studies of the Tewaukon National Wildlife Refuge, Sargent County, North Dakota, and the Waubay National Wildlife Refuge, Day County, South Dakota" (Jackson and Toom 1999).

The Northeastern Plains cultural chronology can be divided into five basic periods:

1. Paleoindian (9500–5500 B.C.)
2. Plains Archaic (ca. 5500–500 B.C.)
3. Plains Woodland (500 B.C.–A.D. 1000)
4. Plains Village (A.D. 1000–1780)
5. Historic (A.D. 1780–1890)

The names of the first four periods also refer to mainly prehistoric Native American cultural traditions, with the Plains Village tradition extending into early historic times. The Historic period encompasses the decline of the Plains Village tradition and the rise of the Plains Equestrian tradition, which developed as a consequence of the introduction of the domestic horse, European manufactured trade goods, and epidemic diseases. It subsumes Native American lifeways during

protohistoric and early historic times in the Northern Plains from about A.D. 1780 to A.D. 1880. Later in the Historic period, at the end of the Plains Equestrian tradition at ca. A.D. 1880, the Euroamerican tradition becomes dominant.

**PALEOINDIAN PERIOD (9500–5500 B.C.)**

The Paleoindian period has been provisionally dated to approximately 9500–5500 years B.C. The age range of this period is based mainly on Paleoindian finds elsewhere in the Great Plains because the amount of Paleoindian artifacts identified in the Northeastern Plains subarea is minimal. This period began with the initial entry of humans into the Northeastern Plains following the retreat of the last Pleistocene glaciers. These Paleoindian peoples exhibited nomadic settlement patterns and subsistence economies based on hunting and gathering that were adapted to late Pleistocene and early Holocene climates, animals, and plants.

Paleoindian artifacts have rarely been identified in the eastern Dakotas, but they are more common farther west. In the eastern Dakotas, including the Glaciated Plains and Prairie Coteau, erosion has been limited (in comparison to the western Dakotas); consequently, most of the upland land surfaces have been relatively stable since the last glacial retreat. The modern ground surface is therefore essentially the same surface as that on which Paleoindian peoples lived, so cultural remains of those peoples should be present at or near the surface. If Paleoindian materials are present, they are likely in poor context because of the cumulative effects of thousands of years of bioturbation and approximately 100 years of agricultural plowing.

**PLAINS ARCHAIC PERIOD (5500–500 B.C.)**

The Plains Archaic period followed the Paleoindian period from approximately 5500 B.C. to 500 B.C. Relatively few Plains Archaic sites have been identified in the Northeastern Plains, and even fewer have been extensively investigated. This period is characterized as an extension of the nomadic hunting and gathering adaptation from the preceding period, but it was adapted to essentially modern (Holocene) climate, fauna, and flora. Bison remained the principal quarry of these people, although deer, elk, and moose were exploited along the prairie/woodland transition. There is also evidence of intensified seed and plant gathering and processing during the Plains Archaic period. Other changes included the adoption of the atlatl and dart, and an overall decline in the quality of flintknapping.

**PLAINS WOODLAND PERIOD (500 B.C.–A.D. 1000)**

Plains Woodland lifeways are thought to have shared many similarities with those of the Plains Archaic period, particularly subsistence economies based on hunting and gathering. However, the practice of

mound burial, possibly indicative of more complex ceremonialism; the production and use of ceramic vessels; and the first use of the bow and arrow all appear to have been developments that distinguish the Plains Woodland period. It is also possible that horticulture made its first appearance during Plains Woodland times, but direct evidence of this is lacking in the Northern Plains. It also has been suggested that Plains Woodland peoples enjoyed a somewhat more settled lifeway, shifting from the fully nomadic settlement pattern of the Plains Archaic period to a seminomadic pattern.

Artifact assemblages of the Plains Woodland tradition reflect the introduction of ceramic technology and the acquisition of exotic trade materials. Late in the tradition, the transition from dart or spear points to arrow points can be seen in weapons technology. The lifeway is characterized by increased sedentism, population growth, and the construction of earthen burial mounds. The appearance of the Plains Woodland tradition in the eastern Dakotas is an extension of the general Woodland lifeway that flourished throughout the Midwest (to the east and southeast) during this period. Again, adaptation to the plains/prairie environment resulted in a distinctive subsistence pattern that relied heavily on bison hunting. Plains Woodland campsites are generally identified where river and stream valleys extended into the Plains proper, affording a riparian setting for the establishment of base camps.

### **PLAINS VILLAGE PERIOD (A.D. 1000–1780)**

In the Northern Plains, the Plains Village tradition is best known from its many village sites that have been found in the Middle Missouri subarea, a region consisting essentially of the Missouri River trench in the Dakotas. The Plains Village tradition first appeared in the Middle Missouri at about A.D. 1000. It flourished there throughout most of the late prehistoric period and persisted in attenuated form well into historic times. The period is brought to a close at A.D. 1780 following the decimation of the Plains Village population base along the Missouri River by a smallpox epidemic that originated in the American Southwest.

Plains Village culture was distinctly different from its Plains Woodland antecedent. It was characterized by the construction of substantial, permanent dwellings, known as earthlodges, that were arranged into villages of various sizes and configurations, some of which were fortified and some not. Subsistence was based on a mixed strategy of horticulture, or garden agriculture, including the cultivation of maize, beans, squash, and sunflowers; bison hunting; and general hunting and gathering, or foraging. Continued elaboration and sophistication in ceramic manufacture also typify the period, with well-made, globular-shaped and shouldered pots exhibiting a wide variety of stylistic variability typifying most village collections.

The Plains Village settlement pattern is interpreted as semi-sedentary, with people residing in their villages at various times of the year, especially during times of important horticultural activity, and leaving their villages at other times to go on extended hunts. A key element in the Plains Village adaptation was the production of a dependable, storable, surplus food supply. This surplus consisted of both meat and garden produce that was usually stored in subterranean storage pits, commonly called cache pits, another identifying attribute of the tradition. Considerable archeological and ethnohistorical evidence indicates direct connections between the prehistoric Plains Village tradition; the related Coalescent Tradition in the Northern Plains; and the historically known Mandan, Hidatsa, Arikara, and Cheyenne peoples.

### **PROTOHISTORIC AND EARLY HISTORIC PERIOD (A.D. 1780–1890)**

The Plains Equestrian tradition, also referred to as the Equestrian Nomadic tradition, evolved during protohistoric and early historic times following the introduction of the domestic horse via trade networks extending into the Spanish Southwest. In the Northern Plains, acquisition of the horse by Native American peoples was well underway by about A.D. 1750. The Plains Equestrian tradition represents the well-known nomadic bison hunters of early historic times who spent much of the year in tipi camps. During this period, there was greater cultural interaction among native groups as a consequence of improved transportation (i.e., the horse) and ever increasing Euro-American influence.

“Protohistoric” refers to the time of initial Euro-American cultural impact on native cultures prior to actual contact. European cultural influence may have come as early as A.D. 1650 with the introduction of trade goods filtering into the area from the north via native trade networks. As mentioned above, horses were introduced from the south by the mid-1700s. By the end of the eighteenth century and the beginning of early historic times, fur trade expansionism had profoundly influenced Native American lifeways in the Dakotas. Participation in the trading system brought changes in material culture and subsistence practices as interaction with Euro-Americans intensified.

Later in the Historic period—by about A.D. 1880—Euro-American domination of what was to become North and South Dakota was complete. Permanent non-Indian settlement of the States came about with the construction of railroads and the security of military protection. Military occupation of the Dakotas accelerated in response to the 1862 Sioux Uprising in Minnesota. The establishment of permanent forts in the Dakota Territory prepared the way for settlement. In addition to the military complement and their families, a civilian population was employed to supply goods and services to the army. Railroads penetrated

the territory in the 1870s, and homesteaders immigrated to the area partly because transportation and military protection were assured. Settlers acquired land from the railroads or from the government through the Homestead, Pre-emption, and Timber Culture acts in the 1870s and 1880s. Agricultural settlement followed a cyclical pattern of boom and decline, especially in the eastern part of the State. Settlement spread generally from east to west, and in 1889 the Dakotas achieved statehood.

## 4.4 Visitor Services

The Improvement Act emphasizes the importance of compatible, wildlife-dependent recreation. The act identifies six priority public uses: hunting, fishing, wildlife observation, photography, environmental education, and interpretation.

### HUNTING

Centuries ago, the coteau areas were considered a prominent landmark to the Plains Indians and early European settlers who camped and hunted waterfowl and other game species in the wetlands and potholes areas. With the settlement of the prairie States, certain hunting restrictions were established for the protection and propagation of wildlife.

Through Federal Duck Stamp sales, districts purchase and provide habitat for migratory and nesting waterfowl. Hunting of migratory waterfowl is allowed at WPAs, where only federally approved nontoxic shot is permitted. All other State regulations apply at WPAs.

Most of the WPAs are open to hunting for upland birds (ring-necked pheasant, sharp-tailed grouse, gray partridge). The districts also offer archery, rifle, and muzzleloader deer hunting.

### FISHING

Fishing is allowed year-round at the districts; however, ice fishing during the winter months seems to be the most popular fishing activity. Restrictions on vehicle access into WPAs may be limited to designated trails. Permanent lakes at the districts offer fishing for northern pike, walleye, yellow perch, and a few other species.

Due to the abundance of aquatic life in the permanent wetlands, growth rates of fish are often very high. Fishing on WPAs, like all fishing on Service lands, requires the angler to follow both State fishing regulations and special refuge regulations.

### WILDLIFE OBSERVATION AND PHOTOGRAPHY

The districts provide outstanding opportunities for viewing wildlife. They offer optimal viewing for waterfowl, grassland birds, and shorebirds from April through early June and from late August through



*District programs reach out to young hunters.*

October. Seasonal highlights include the spring courtship dances of sharp-tailed grouse and western grebe, spring and fall shorebird migrations, daily fall movements of thousands of waterfowl, and winter activities of various bird and mammal species. Many wildlife species can be observed from public roads. In some areas, viewing blinds are available, and their locations on the districts change from time to time. Please contact individual district offices to obtain information on current viewing blind availability.

### ENVIRONMENTAL EDUCATION AND INTERPRETATION

Each district has either a standalone headquarters or a headquarters co-located with a national wildlife refuge. Each headquarters office displays information in the visitor contact area.

The visitor centers offer exhibits and a variety of informational pamphlets about the Service, district, Refuge System, and other natural resources-related information. Strategically located kiosks contain information about prairie wetlands and wildlife species found throughout the districts. District staff provides educational talks and tours for schools and other groups, on request. The environmental education and outreach programs expand beyond the boundaries of the districts. District staff is involved in local, regional, and statewide programs.

### TRAPPING

Recreational trapping is available at all WPAs, in accordance with State trapping regulations. Authorized by 50 CFR, part 31.16, recreational trapping is administered by the Service.

## 4.5 Partnerships

District staff has established partnerships with a wide variety of local, State, and national groups in efforts to achieve habitat objectives or expand environmental education. Most districts have local partnerships with weed boards, water resource boards, rural volunteer fire departments, law enforcement departments, Scouts, 4-H clubs, and private landowners. The districts have worked closely with SDGFP on projects such as hunting and fishing opportunities, disease issues, and management of habitat and invasive plants. District staff has developed partnerships with groups and agencies such as the U.S. Army Corps of Engineers, Ducks Unlimited, The Nature Conservancy, National Audubon Society, National Wild Turkey Federation, National Fish and Wildlife Foundation, USGS, and NRCS for habitat management, research, and environmental education.

## 4.6 Socioeconomic Environment

A socioeconomic study prepared by BBC Consulting (2009) is the source for information in this section.

### BACKGROUND

The three districts offer hunting, fishing, wildlife observation, photography, environmental education, and interpretation opportunities to the public. These recreational opportunities attract visitors, who spend money in the surrounding communities. Ancillary visitor activity, such as spending on food, gasoline, and overnight lodging, provides local businesses with supplemental income. Management decisions regarding public use, expansion of services, and habitat improvement measures at the districts affect recreation activity and, consequently, visitor expenditure.

### CURRENT SOCIOECONOMIC, POPULATION, AND EMPLOYMENT CONDITIONS

The only large metropolitan area in the planning area is Sioux Falls in Minnehaha County. Other large communities in the planning area include Pierre, Huron, and Aberdeen. According to 2006 population estimates by the Bureau of Economic Analysis, the planning area is home to almost 347,000 individuals, or about 44 percent of the South Dakota population. Population growth in the planning area has been driven exclusively by growth in the metropolitan area south of Sioux Falls, the most populous city in South Dakota. The population of this city grew by more than 50 percent between 1980 and 2006, while the population in

the rest of the planning area declined by more than 20 percent.

According to the Bureau of Economic Analysis, the planning area employs about 268,500 workers.

This same source discloses that most of the jobs in South Dakota are in government (13 percent), retail trade (12 percent), "other professional services" (12 percent), and health care and social assistance (11 percent). According to the Bureau of Labor Statistics, unemployment in the planning area ranged from 2.2 percent in Brookings County to 11.5 percent in Buffalo County in 2008. However, with the exception of Buffalo County, all counties in the planning area had unemployment rates below 5 percent. South Dakota's statewide unemployment rate of 4.6 percent was one of the lowest in the country during this period.

### District Operations, Staffing Conditions, and Recreational Opportunities

Huron, Madison, and Sand Lake WMDs share contiguous boundaries in eastern South Dakota. Similarly, they share management activities such as controlling water quality and quantity, mitigating the presence of invasive species, disease control, restoration of native plant species, and ecological research.

Huron WMD currently employs 12 full-time, year-round employees, while Madison WMD employs 9 full-time, year-round employees. Sand Lake National Wildlife Refuge Complex, of which Sand Lake WMD is part, employs 11 full-time, year-round and 6 seasonal employees, but most of these employees are shared by the district and Sand Lake National Wildlife Refuge. Based on estimates of the relative amount of time spent by each employee on management at the district versus the refuge, and considering their full-time or seasonal status, the district supports the equivalent of about 6.25 FTEs (full-time equivalents).

Hunting, the principal activity driving the area's tourist industry, is by far the most popular visitor activity at all three districts, accounting for about 80 percent of visitation. The fall hunting season brings thousands of visitors by road and air into eastern South Dakota, and in many communities lodging is fully booked throughout this period. The majority of these hunters come to hunt pheasant, but some hunt migratory birds and a small portion pursue big game. The largest number of hunters visit Madison WMD due to its proximity to Sioux Falls, and hunting activity generally decreases along the Highway 14 corridor toward Huron WMD and the more remote Sand Lake WMD. Nevertheless, the cities of Huron and Aberdeen experience large influxes of hunters during the hunting season.

Fishing accounts for about 12 percent of visitation to the districts. It is most popular at Madison WMD, accounting about 14 percent of the visitation to this

district. Huron and Sand Lake WMDs report a combined total of fewer than 100 fishermen per year.

Non-consumptive recreational activities account for less than 8 percent of visitation to the districts and take place year-round, although they are most popular during the spring and summer months. Birding is the most popular non-consumptive activity at the districts, especially during the migration season.

Trapping is also permitted at the districts and accounts for about 19,800 visits per year to Madison WMD. Camping is not permitted on lands managed by the districts, although visitors often stay overnight in local commercial lodging establishments.

Annual visitation to the three districts in recent years has totaled more than 240,000 visitor-days, according to district staff. The majority of visitation (more 207,500 visitor-days) takes place at Madison WMD, due to its proximity to Sioux Falls. Huron WMD sees about 27,000 annual visitor-days and Sand Lake WMD only about 6,000.

District managers estimate that slightly less than a quarter of visitation (58,200 visitor-days) involves non-locals, but this proportion varies greatly by visitor type. More than 60 percent of pheasant hunters are from outside the planning area, compared to only 6 percent of big game hunters. District fisheries do not attract many trophy fishermen from outside the area, and fishing-related visitation to the districts is almost entirely local. An estimated 13 percent of non-consumptive recreational visitors to the districts are non-local. The proportion of visitation that is non-local also varies by district: almost 80 percent of visitation to Madison WMD is local due the presence of Sioux Falls; Huron WMD draws a somewhat higher proportion of non-locals (about one-third); and the more remote Sand Lake WMD has the highest proportion of non-local visitation (60 percent).

Offsite spending by visitors helps support local lodging and retail establishments in surrounding towns. Only non-resident visitor spending can be considered when calculating the socioeconomic impact of refuges on the local economy in the planning area in eastern South Dakota. The money spent by local residents on visitation to these districts would likely be spent on other local recreational activities if the complex did not exist, so it cannot be considered “new” expenditure in the local economy.

The Service’s Banking on Nature 2006 study examines visitor expenditure by activity (hunting, fishing, or non-consumptive) for a sample of refuges and districts throughout the country. Huron WMD and Madison WMD are both profiled in this study; Sand Lake WMD is not. However, representations by district managers indicate that visitation to Sand Lake WMD is very similar to visitation to Huron WMD, and that spending levels are likely the same. Based on data reported in Banking on Nature, the average

daily expenditure of non-local visitors to the districts is about \$79 for hunters, \$56 for anglers, and \$25 for wildlife viewers and recreationists.

### **Baseline Economic Activity**

The three districts affect the economy through the non-resident visitor spending they generate and the employment they support. The districts employ approximately 27.25 FTEs. A full-time year-round employee counts as one FTE, while seasonal and part-time employees, as well as those shared by districts and refuges, are counted as a fraction of an FTE. Payroll supported by the three districts totals \$1,735,000, or nearly \$64,000 per FTE. Using Bureau of Labor Statistics Consumer Expenditure Survey data for individuals in this income category, roughly 79 percent of annual income is spent locally. Under this assumption, the WMDs contribute \$1,371,000 to the local economies in employee spending.

### **Visitor Spending**

The three districts currently experience total visitation of approximately 58,200 non-resident visitor days per year. Of these, roughly 54,400 are for hunting, 1,500 for fishing, and 2,300 for non-consumptive recreational activities. Combining these visitation numbers with nonresident spending averages from the Banking on Nature study, total visitor expenditure generated by the three districts is estimated to be \$4,414,000 per year. Almost all expenditures (almost 97 percent) come from hunting and the remainder from fishing and non-consumptive recreation. Combining the effects of Service employment and visitor spending, the total direct economic activity generated by the Huron, Madison, and Sand Lake WMDs on the planning area is approximately \$5.79 million annually.

## **4.7 Operations**

Funding for operations at the districts supports the staff, facilities, and equipment needed to carry out management activities to meet the each districts’ purposes, goals, and objectives. Each of the three stations that is not part of a complex has its own staff and facilities. Despite that, office working conditions are limited and can impose some constraints on conducting business.



# CHAPTER 5— Environmental Consequences



Wyman Meinzer/USFWS

*Sandhill cranes flying overhead.*

This chapter describes the environmental consequences for the management alternatives considered for the three wetland management districts (see chapter 3). The Service assessed the environmental consequences of carrying out each alternative on the biological, physical, social, economic, and cultural resources of the districts.

## 5.1 Effects Common to All Alternatives

All alternatives would have the same effects on the following resource areas, as described in this section:

- climate change
- soils
- water quality, wetlands, and floodplains
- air quality
- cultural resources
- socioeconomics
- public health and safety
- environmental justice

### CLIMATE CHANGE

The actions proposed in this document would conserve or restore land and habitat, thus retaining existing carbon sequestration in the districts. These actions

would contribute positively to efforts to mitigate human-induced global climate change.

The use of prescribed fire, which releases CO<sub>2</sub>, would result in no net loss of carbon sequestration capacity because new vegetation would quickly replace the consumed biomass. Overall, there should be little or no net change in the amount of carbon sequestered at the districts under any of the management alternatives. As it relates to global climate change, the documentation of long-term changes in vegetation, species, and hydrology is an important part of monitoring and research. Adjustments in management may be necessary over time to adapt to a changing climate.

### SOILS

All alternatives would beneficially affect soil formation processes on district lands. Some disturbances to surface soils and topography would occur at those locations selected for administrative, maintenance, and visitor facilities; invasive plant removal and eradication; and restoration of native habitat.

### WATER QUALITY, WETLANDS, AND FLOODPLAINS

All alternatives would beneficially affect water quality. Such effects are anticipated to result from protecting groundwater recharge, preventing runoff, retaining sediment, and minimizing nonpoint source pollution.

The management alternatives are not anticipated to have any adverse effects on the districts' wetlands and floodplains, pursuant to Executive Order (EO) 11990 and EO 11988.

## AIR QUALITY

No adverse effects on air quality are expected. Short-term effects on air quality from the use of prescribed fire at the districts would not vary significantly between any of the alternatives.

## CULTURAL RESOURCES

Overall, cultural resources would be enhanced through protection of existing resources and extension of such protection to newly discovered cultural resources.

Cultural resource surveys in the districts have been limited on the Service's fee-title lands. Consequently, additional surveys would be required before any new construction or excavation to comply with NEPA and applicable acts and policies related to historical and archaeological resources. Potentially adverse effects from construction of trails or facilities would require review by the regional archaeologist and consultation with the South Dakota State Historic Preservation Office.

## SOCIOECONOMICS

Economic impacts are typically measured in terms of numbers of jobs lost or gained and the associated result on income. None of the alternatives would significantly affect the economics of the local area.

## PUBLIC HEALTH AND SAFETY

None of the alternatives are anticipated to have any adverse effects on the quality of the human environment, including public health and safety.

## ENVIRONMENTAL JUSTICE

None of the alternatives would disproportionately cause any adverse environmental, economic, social, or health effects on minority or low-income populations.

Implementation of any action alternative that includes visitor services and environmental education is anticipated to benefit minority and low-income citizens living near the districts by stimulating the economy and creating jobs.

# 5.2 Description of Consequences by Alternative

Management actions are prescribed under each alternative as the means for responding to problems and issues raised by Service managers, the public, and governmental partners. Because management would differ under each alternative, some of the environmental effects resulting from implementation would likely differ as well.

This section presents an analysis of the effects anticipated to result from the alternatives. Table 3 in chapter 3 summarizes these findings. The effects are

organized to correspond to the presentation of the affected environment in chapter 3.

## ALTERNATIVE A—CURRENT MANAGEMENT (NO ACTION)

### Habitat and Wildlife

The current level of habitat management would be maintained at approximately the same intensity using the same resources (funding and staff). All management activities at WPAs would be prioritized, with only the high-priority WPAs receiving consistent management.

All conservation easements would continue to be monitored annually, and all easement violations would be consistently enforced. Habitat protection through acquisition efforts would focus on high-priority tracts. Only those legally identified invasive plants on high-priority WPAs would be addressed with some type of management. Active management such as prescribed burning, grazing, farming, and invasive plant control would be used to maintain and improve native prairie tracts and tamegrass units. The quality of native vegetation on high-priority WPAs would be improved, and vegetation on medium- and low-priority WPAs would be maintained at current conditions.

District staff would continue the current level of monitoring and documenting the presence and use of district lands by federally listed species, such as piping plover and whooping crane. The staff would continue to impose area closures to public use to protect federally listed species using the districts.

Prescribed burning during the nesting season can lead to nest destruction and/or increased nest production. Destruction is usually caused by burning nests, but islands of unburned areas may be targeted by nest predators (e.g., coyote, skunk, raccoon). However, birds frequently re-nest if the nest is destroyed, although re-nests typically contain fewer eggs. This loss of nests and potential reduction in bird numbers is offset in future years by improved habitat conditions, which lead to improve nesting conditions and numbers.

Prescribed fire's effects on vegetation are influenced by the fire's heat and the phenological state of the vegetation. Grass fires conducted in late spring generally benefit warm-season grasses while decreasing native forbs and cool-season grasses. Late summer burns can reduce woody encroachment.

Fire has little effect on wetland vegetation other than removal of residual cover. However, if wetland soils are dry, fire can burn down into these organic layers and kill cattails and phragmites. Fires during drought conditions may lead to increased soil erosion by reducing regrowth.

Prescribed fire can assist in controlling nonnative vegetation, often in concert with chemical treatment. Prescribed fire in conjunction with chemical or mechanical treatments can be used to reduce hazardous



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*The black-crowned night heron is a wetland inhabitant on several continents.*

fuels and reduce risk of wildfire damage. Prescribed fire reduces wildland fuel loadings leading to a reduction in a wildfire's resistance to control.

Prescribed fire treatments for Huron, Madison, and Sand Lake WMDs range between 1,000 and 2,500 acres per station during the past 5 years depending on management needs, funding levels, and priorities.

### Monitoring and Research

By maintaining the current level of monitoring, inventory, and research, Service staff would be able to use available information and sound science to continue making informed management decisions.

### Visitor Services

The hunting and fishing programs at the WPAs would continue to be valued as two of the six priority public uses and would provide hunters with many opportunities to hunt without compromising the System's mission and goals.

The current level of environmental education and interpretive programs would continue to be priority public uses and would provide visitors with many opportunities to learn about the districts and the Refuge System. Events such as Service-led school visits would be conducted upon request. District staff would occasionally make updates to brochures and publications. Staff would undertake occasional media outreach.

### Partnerships

Existing partnerships would allow district staff to accomplish much more than they could in the absence of partnerships. District staff would continue to improve and build partnerships with the local public, primarily landowners adjacent to the WPAs. Partnerships with SDGFP would help the staff manage hunting at the WPAs.

### Operations

District staff would be maintained at existing levels of personnel, funding, and resources. The districts would continue with the current level of operations and

maintenance, including the maintenance of equipment and vehicles in good working conditions to achieve management goals. Prescribed fire acres treated annually would likely decrease because hazardous fuel treatments and wildland-urban interface treatments must be allocated nationwide, and funding is prioritized as appropriate.

## ALTERNATIVE B—INCREASED EFFICIENCY (PROPOSED ACTION)

### Habitat and Wildlife

Under alternative B, district lands would be managed with an emphasis on establishing and following an improved, science-based priority system to restore prairie habitats to native vegetation for the benefit of waterfowl, State- and federally listed species, migratory birds, and other native wildlife. The focus of this alternative would be to restore ecological processes and native grassland species where possible. District staff would monitor and enforce all conservation easements. Monitoring efforts would evaluate the effects of management and restoration actions on target migratory birds.

Alternative B would offer the potential to increase the quality and distribution of native grasses and forbs, leading to a corresponding decrease in the acreage of nonnative grasses and forbs. Once some degree of success is achieved in this undertaking, it is likely that, through continued management, the degree of future invasion would be minimized.

The management actions specified under this alternative, if successful, would result in improved breeding habitat conditions for the target bird species—waterfowl, shorebirds, and grassland-dependent neotropical migrants—and commensurate increased nest success and nest densities for these groups. Less favorable breeding habitat conditions could be created for certain species, such as nonnative birds.

Predator management through trapping, where feasible and desirable, could lead to a reduction of nest predators (such as skunks, red fox, and raccoon); however, such an approach could also result in expanded populations of small mammals such as shrews and voles as a result of the removal of mid-sized predators.

Removal of trees would result in less favorable habitat conditions for game species such as wintering deer and resident bird species. Landscape fragmentation would be reduced through the replanting of native grass cover in areas where trees are removed, as well as through acquisition of additional lands.

Habitat protection through acquisition would focus on high-priority conservation easements.

In the long term, waterfowl and other grassland birds would benefit from increased areas of native prairie that, otherwise, would be invaded by introduced grasses and forbs.

## Monitoring and Research

District staff would improve their understanding of the effects of management activities in upland communities (for example, prescribed burning, grazing, and haying) on the composition and structure of vegetation communities. Monitoring would also contribute to better understanding of how management activities in both uplands and wetlands affect overall habitat productivity.

Under this alternative, district staff would set priorities and develop strategies regarding the extent of land in the WPAs that is monitored for changes in vegetation structure and composition in wetland and upland habitats. Sustained monitoring activities would lead to an improved understanding of wildlife responses to management activities, facilitating better management decisions that target specific wildlife objectives. This understanding of habitats at the landscape scale would (1) guide acquisition efforts for habitat protection, and (2) promote management-level research to improve understanding of habitat management practices.

Through additional research, district staff would improve their knowledge of the response of migratory birds—particularly waterfowl, shorebirds, and grassland species—to management actions.

## Visitor Services

There would be no change to the priority uses of hunting, fishing, wildlife observation and photography, and environmental education and interpretation. Further fee-title acquisition of lands within district boundaries would consequently provide visitors with enhanced opportunities for the existing compatible wildlife-dependent recreational opportunities.

District staff would have the opportunity to continue organizing and participating in events such as school visits and waterfowl identification workshops. All visitor programs would be evaluated for their effectiveness and, if necessary, would be modified to ensure the continued and expanded quality of programs and visitor experiences. The districts would evaluate community interest in existing and potential new programs to ensure that the CCP's vision and the Service's and System's missions are met. Brochures and publications would be reviewed annually, and updates would be completed as needed.

With expanded and new visitor facilities, district staff would be able to (1) meet the demand for increased visitation, (2) provide infrastructure to conduct education programs for school groups, and (3) host larger, more diverse groups of visitors.

## Partnerships

Maintenance of existing partnerships and pursuit of new ones would increase the Service's ability to provide quality habitats for waterfowl, shorebird, and grassland bird species and improve public use opportunities. District staff would have improved relationships with

a greater number of private landowners, government agencies, and NGOs.

## Operations

Under alternative B, increased funding is not contemplated for staff, equipment, or supplies (such as fuel and native grass seed). Consequently, the districts would rely on increased efficiencies to afford district staff the ability to accomplish goals and objectives associated with habitat and wildlife management, visitor services, monitoring, and research.

Increased efficiencies and partnerships would enable the districts to meet legal and obligated mandates, to provide management at high- and medium-priority WPAs, to use limited resources for other projects, and to provide adequate law enforcement for visitor safety and protection of facilities and wildlife. This alternative would result in both positive and negative effects pertaining to the use of prescribed fire. Increased efficiencies would allow high-priority treatments to be accomplished, but the overall acreage treated with prescribed fire could be reduced due to funding constraints associated with the National Fire Plan.

## ALTERNATIVE C—INCREASED EFFICIENCY WITH EXPANDED RESOURCES

### Habitat and Wildlife

In addition to the effects described for alternative B, alternative C would increase the number of treated units, thereby increasing the acreage of native grasses and forbs. This increase would result in a corresponding decrease in the acreage of nonnative grasses and forbs.

Under this alternative, district staff would expand the use of prescribed fire and of other habitat management tools. This alternative would facilitate a finer scale of restoration, with a greater focus on local genetics and diversity of plant species included in seeding projects. More restoration, albeit partial, would occur on more lands under this alternative.

Use of IPM activities would provide for a more proactive and effective treatment program.

Because degraded wetlands would be proactively identified and treated to improve their condition under this alternative, it is expected that a more robust and diverse population of waterfowl, other waterbirds, neotropical migrants, and other wildlife would make use of these habitats.

### Monitoring and Research

District staff would improve their understanding of the effects of management actions on vegetation composition and structure. Specific research would be conducted to answer management questions and improve understanding of native prairie habitat. Under this alternative, district staff would complete baseline inventories and would refine ongoing inventory efforts, thus allowing for increased knowledge of the natural

resources in the districts and increased efficiencies in subsequent land management treatments.

Grassland-, wetland-, and wildlife-monitoring activities would be increased through additional funding and resources. Vegetation transects on native prairie habitats would be expanded to include more district lands and would be surveyed annually. Ultimately, this alternative would result in an improved understanding of wildlife responses to management activities, allowing for better management decisions that target specific wildlife objectives. The result would be improved habitat throughout the districts and a better ability for staff to maintain and improve recruitment of target wildlife populations.

Through additional research, district staff would improve their knowledge of the response of migratory birds—particularly waterfowl, shorebirds, and grassland species—to management actions.

### Visitor Services

In addition to the effects described for alternative B, enhanced outdoor education opportunities would enable students to gain an improved understanding of South Dakota's natural history, wildlife biology, the history and qualities of Service lands, and the missions of the Service and the System.

Public use would be enhanced, outdoor classroom activities would be developed, and interpretive exhibits and displays would be added to improve the public's understanding of South Dakota's prairie system and associated wildlife. District staff would be increasingly able to conduct or support more events, such as school outdoor lab activities and waterfowl identification sessions.

These changes would give the districts the potential to generate greater support for future district and System programs.

### Partnerships

Maintenance of existing partnerships and pursuit of new ones would increase the Service's ability to provide quality habitats for waterfowl, shorebird, and grassland bird species and improve public use opportunities. District staff would have improved relationships with a greater number of private landowners, government agencies, and NGOs.

### Operations

In addition to the effects described for alternative B, increased funding would be available for facility and program development, as well as for possible increased costs for operations and staff. Increased resources would enable district staff to monitor and enforce all conservation easements.

## 5.3 Cumulative Impacts

Cumulative impacts are the potential effects of each alternative in combination with past, present, and future actions. NEPA regulations define cumulative effects as “the impact on the environmental which results from the incremental impact of the actions when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor, but collectively significant actions taking place over time.” (40 CFR 1508.7.)

The cumulative effects analysis for this draft CCP and EA is based on reasonably foreseeable future actions that, if carried out, would contribute to the effects of the alternatives. No reasonably foreseeable actions are anticipated. Impacts would be monitored during implementation of the final CCP. Implementation over an extended period would reduce the likelihood of negative cumulative impacts.

NEPA requires mitigation measures when the environmental analysis indicates possible adverse impacts on habitats, wildlife, or the human environment. All activities that constitute the Service's proposed action (alternative B) are not expected or intended to produce significant levels of environmental impacts that would require mitigation measures. Nevertheless, the final CCP will contain the following measures to preclude significant environmental impacts from occurring:

- Federally listed species will be protected from intentional or unintentional adverse effects by banning or restricting activities where these species occur.
- All proposed activities will be regulated to reduce potential effects on wildlife and plant species, especially during their sensitive reproductive cycles.
- Hunting safety regulations will be closely coordinated with and enforced by district staff and SDGFP personnel.
- Monitoring protocols will be established to determine goal achievement levels and possible unforeseen effects on resources. Results of monitoring will be used in developing and implementing adaptive management measures to ensure that habitat and wildlife resources, as well as cultural resources, are preserved.
- The final CCP can be revised and amended after 5 years of implementation for application of adaptive management to correct unforeseen effects that occur during the first years of the plan.



# CHAPTER 6— Implementation of the Proposed Action



Bridgette Flanders-Wanner/USFWS

*A young enthusiast measures up at a visitors' center.*

The planning team developed objectives in support of goals identified in chapter 2 to carry out the proposed action (alternative B) for management of the Huron, Madison, and Sand Lake WMDs. This chapter presents suggested strategies to achieve objectives; rationale supporting the goals, objectives, and strategies; and assumptions used in developing the plan.

Biological goals and objectives emphasize management of plant communities as habitat for wildlife, especially migratory birds, and are organized by major habitat types that occur in the three districts. Goals and objectives are habitat- rather than wildlife-based, because wildlife often respond to factors beyond control of local refuge management (for example, disease outbreaks or habitat conditions on important staging or wintering sites can affect populations of migratory birds). Furthermore, management practices (such as fire, grazing, haying, tree removal, and water level manipulation) focus on plant communities rather than wildlife populations. Habitat-based objectives emphasize monitoring of important vegetation attributes such as community composition and vegetation structure over time. In most cases, wildlife population responses to habitat changes are not directly monitored. Rather, site-specific inventories, applied research, and literature reviews allow for reasonable predictions of wildlife response to habitat management.

According to Section 7 of Director's Order 172, "Responsibilities of Federal Agencies to Protect Migratory Birds" (USFWS 2004a):

Many Service programs are actively involved in bird conservation activities. Our objective for migratory bird management and conservation is to minimize the potential adverse effects of migratory bird take, with the goal of striving to eliminate take, while implementing our mission. All Service programs strive to take an ecosystem approach to protection and restoration of species and their associated habitats. As migratory birds is one of our trust resources, all programs must emphasize an interdisciplinary, collaborative approach to migratory bird conservation in cooperation with other Service programs, in addition to other governments, State and Federal agencies, and non-Federal partners. However, we recognize that direct or indirect actions taken by Service employees in the execution of their duties and activities as authorized by Congress may result in the take of migratory birds. In many instances, short-term negative impacts on migratory birds are balanced by long-term benefits. We will incorporate ecosystem integrity, reduction of invasive species, and long-term adaptive management in migratory bird management, using the best available scientific information.

## 6.1 Identification of the Proposed Action

The Service has identified a proposed action (alternative B) after a determination that it accomplishes the following:

- best achieves the districts' purposes, vision, and goals
- helps fulfill the System mission
- maintains and, where appropriate, restores the ecological integrity of the districts and the System
- addresses the significant issues and mandates
- is consistent with principles of sound fish and wild-life management

## 6.2 Description of Alternative B, the Proposed Action

Alternative B is the proposed action for the CCP for the three districts. Under alternative B, management of the three districts would emphasize developing and implementing an improved, science-based priority system to restore native prairie habitats for the benefit of waterfowl, State- and federally listed species, migratory birds, and other native wildlife. District staff would focus on high-priority tracts and, when possible, on medium-priority tracts. The districts' focus would be to restore ecological processes and native grassland species to the greatest extent possible within the parameters of available resources and existing constraints. District staff would seek to maintain the existing levels and types of public use programs, ensuring that programs offered to the public are of consistently high quality.

## 6.3 Goals, Objectives, Strategies, and Rationale

The management direction presented here meets the purposes, vision, and goals of the three districts. Objectives and strategies to carry out the goals would support both resource needs and public use.

- A goal is a descriptive, broad statement of desired future conditions that conveys a purpose, but does not define measurable units.
- An objective is a concise statement of what is to be achieved, how much is to be achieved, when and where it is to be achieved, and who is responsible for achieving it.

- Strategies are ways to achieve an objective.
- A rationale presents the background details used to formulate an objective. The rationale provides context to enhance comprehension and facilitate future evaluations.

### NATIVE PRAIRIE GOAL

*Conserve, restore, and improve the biological integrity and ecological function of the native prairies to support healthy populations of native plants and wildlife and promote the natural role of fire and grazing in shaping and managing these landscapes.*

The native prairie objectives address tracts of native prairie on fee-title lands within the districts. Native prairie is defined as native ("unbroken") sod. It exists in all three districts in various acreages and with broad management histories. Most of the northern mixed-grass prairie and tallgrass prairie has been destroyed through conversion to agriculture, and remnant tracts appear to be particularly vulnerable to invasion by smooth brome and Kentucky bluegrass (Murphy and Grant 2005).

Contribution to ecosystem integrity and conservation of biological integrity are key roles of the System. Accordingly, the WPAs should contribute to the conservation of native prairies unique to South Dakota.

### Prioritization

Waterfowl habitat protection and restoration are the districts' primary emphases. Strategic planning enables the Service to make decisions on what habitats need protection and what landscapes have the greatest value to the health of waterfowl populations. HAPET, based in Bismarck, North Dakota, conducts research and develops predictive models. Through HAPET's research and modeling of the Prairie Pothole Region of South Dakota, the Service can predict duck pair density. This modeling tool provides the Service with information needed to conserve and restore wetland and grassland landscapes that will benefit waterfowl and other bird species. The Service bases its protection priority for wetland and grassland habitat on this modeling effort. The Service's goal is to protect habitat capable of supporting 25 or more breeding duck pairs per square mile. Figure 10 shows the predicted concentrations of duck pairs throughout the districts.

A 2007 report by the Government Accountability Office analyzed the effectiveness of Service acquisitions under the WPA program. As a consequence of this analysis, the Service recently completed a "decision tree" matrix (shown in figure 11) that outlines how to set priorities for grassland and wetland acquisitions. Strategic planning increases the likelihood of making cost-effective decisions by avoiding misapplications of management treatments or investing in areas with limited potential to affect populations. Strategic planning for waterfowl applies not only to native prairie but to planted grasslands and wetlands as well.

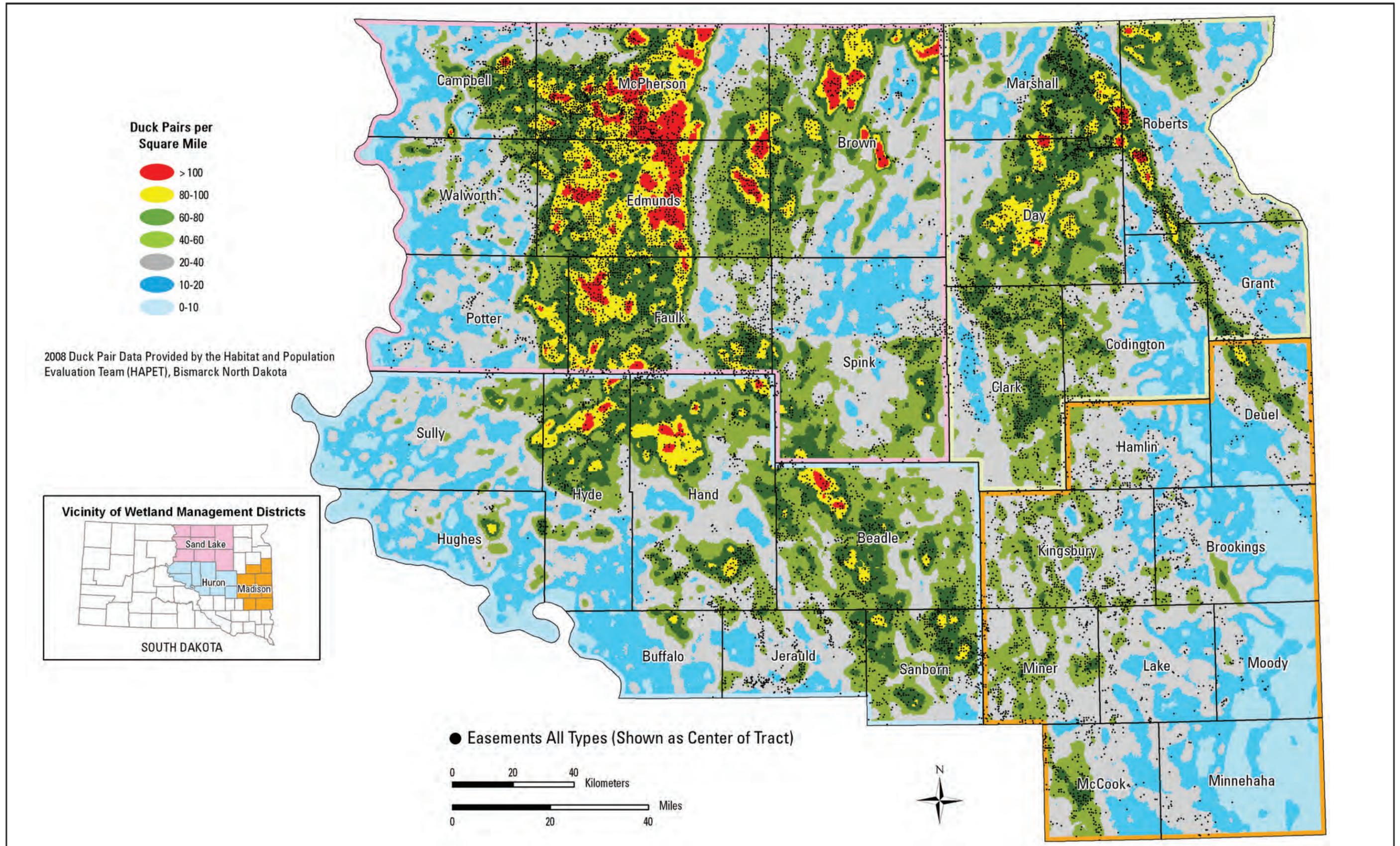


Figure 10. Map of predicted duck-pair concentrations in the three districts, South Dakota.



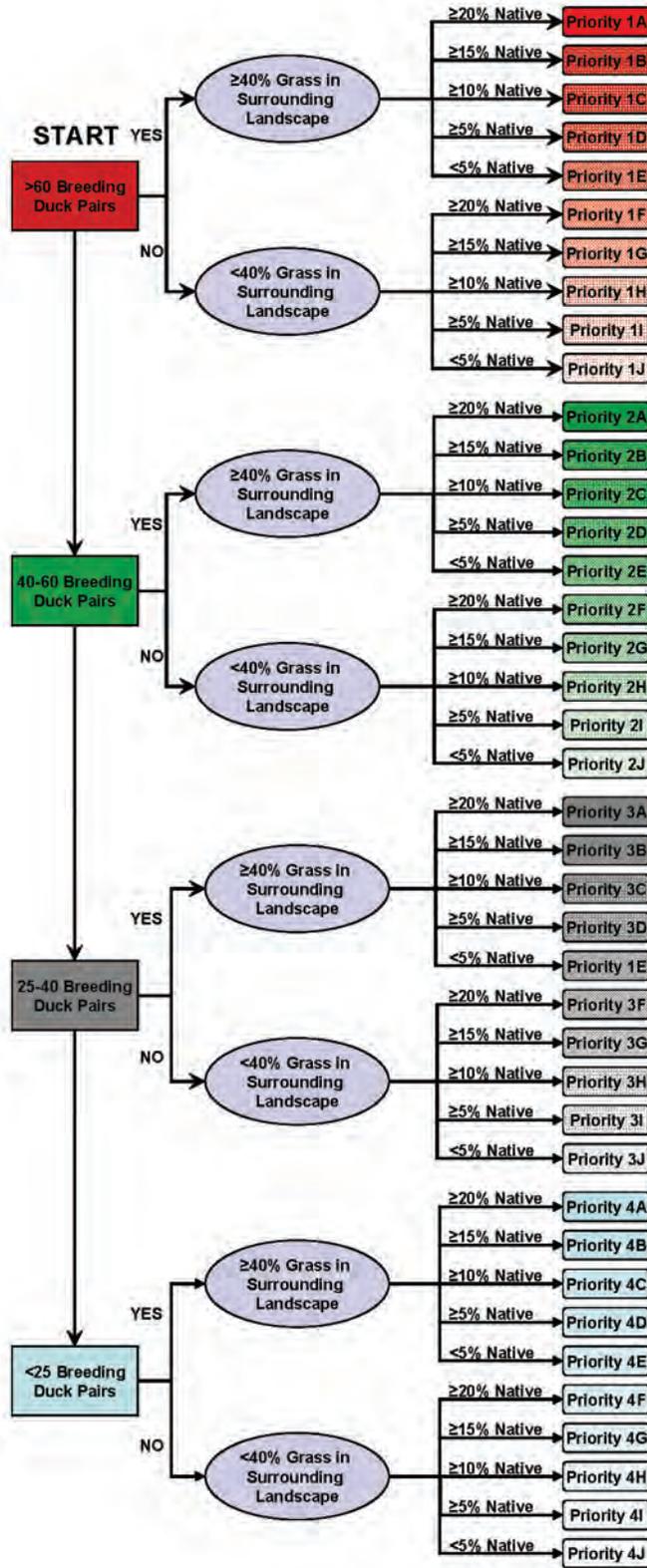


Figure 11. Decision tree for prioritizing management of native sod tracts on WPAs.

**Prioritization Objective**

Implement the standardized, science-based prioritization decision tree developed for the CCP (figure 11) so that limited funding and management resources are objectively allocated to native prairie tracts according to the potential for that tract to benefit waterfowl and grassland birds. Allocate limited resources to native prairie tracts as discussed in the Native Prairie Restoration Objectives below. Allow each district to further refine the prioritization system as additional biological information becomes available; reevaluate the prioritization system 15 years after CCP approval.

**Strategy**

Apply multiple selection criteria for prioritizing native prairie tracts according to the decision tree (figure 11) and as summarized below.

## 1. Primary Criterion—Duck Pairs per Square Mile.

This criterion is divided into four levels of priority— $\geq 60$ ,  $\geq 40$ ,  $\geq 25$ , and  $< 25$  duck pairs per square mile—that match the Service's Grassland Easement

Priority Zones (Ron Reynolds, USFWS, HAPET, personal communication, 2010).

2. Secondary Criterion—Percent Grass on the Landscape. The surrounding landscape is categorized as high or low grass composition— $\geq 40$  percent grass or  $< 40$  percent grass. This criterion coincides with requirements for maintenance levels of waterfowl nesting success (Reynolds et al. 2001).
3. Tertiary Criterion—Native Floristic Composition. This criterion is divided into five levels characterizing the percentage of native species in the vegetation community— $\geq 20$ , 15–19, 10–14, 5–9, and 0–4 percent). Vegetation is characterized by mean frequency (percentage occurrence) of South Dakota Upland Plant Associations (Belt Transect Categories; see appendix F) as described in Grant et al. 2004a.

The result of objectively applying these three criteria using the decision tree (figure 11) is the assignment of a priority level for each tract of native prairie in the three districts (table 9). In all, there are 40 priority

**Table 9. Assigned priority levels according to the decision tree for prioritizing management of native prairie.**

<i>County</i>	<i>WPA</i>	<i>Priority Code</i>	<i>County</i>	<i>WPA</i>	<i>Priority Code</i>
<b>Huron WMD</b>			Sanborn	Long Lake	1E
Hand	Slunecka	1A	Hand	Spring Lake	1E
Buffalo	Mills	1A	Jerauld	Johnson	1J
Hand	VenJohn	1B	Beadle	Moser	1J
Hand	Treichler	1C	Hand	McGillvrey	2A
Beadle	LeClaire	1D	Hyde	Cowan	2A
Beadle	Bauer	1D	Hyde	Harter	2A
Sanborn	Winter	1E	Hand	Boomsma	2C
Beadle	Yauney	1E	Hand	Millerdale	2D
Beadle	Weiting	1E	Hughes	Robbins	2D
Beadle	Maga-Ta-Hohpi	1E	Beadle	LeClaire	2D
Beadle	Shoemaker	1E	Sanborn	Reed	2E
Beadle	Ruppel	1E	Beadle	Reed	2E
Beadle	Rogers	1E	Beadle	Mud Lake	2E
Hand	Lingemann	1E	Hand	Johnson	2E
Beadle	Kleinsasser	1E	Sanborn	Hoarty	2E
Beadle	Ingle	1E	Sanborn	Brandenburg	2E
Hand	Campbell	1E	Hand	Fischer	2E
Beadle	Cain Creek	1E	Sanborn	Linn	2E
Beadle	Boomsma	1E	Sanborn	Long Lake	2E
Beadle	Andressen	1E	Hand	Spring Lake	2E
Hand	Reinhardt	1E	Beadle	Glanzer	2J
Hand	Mullenberg	1E	Hughes	Hyde	3A
Sanborn	Kraft	1E	Sanborn	Zink	3E
Sanborn	Jackson	1E	<b>Madison WMD</b>		
Hand	Cahalan	1E	Deuel	Schafer	1A
Hand	Weideman	1E	Deuel	Coteau Prairie	1A

**Table 9. Assigned priority levels according to the decision tree for prioritizing management of native prairie.**

<i>County</i>	<i>WPA</i>	<i>Priority Code</i>	<i>County</i>	<i>WPA</i>	<i>Priority Code</i>
Deuel	Eilen	1A	Moody	Thompson	2E
Deuel	Miller	1B	Miner	Muller	2E
Miner	Sullivan	1D	Brookings	Wenk	2J
Miner	North Windedahl	1D	Hamlin	Rider	2J
Miner	Hepner	1D	Kingsbury	Hodges	2J
Deuel	Bunde	1E	Kingsbury	Katke	2J
Kingsbury	R.S. Anderson	1E	Kingsbury	Ratfield	2J
Kingsbury	Silver Lake	1E	Kingsbury	Williams	2J
Miner	Corbin	1E	Lake	Fischer	2J
McCook	Gottlob	1E	Lake	Pearson	2J
McCook	Huls	1E	Moody	Heinricy	2J
Miner	Twin Lakes	1E	McCook	Reif	2J
McCook	Sabers	1J	Moody	Benson	2J
McCook	Schuldt	1J	McCook	Holm	2J
McCook	Hamaker	1J	Lake	Cassutt	2J
Hamlin	Peterson	2A	McCook	Hamilton	2J
Deuel	Nelson	2A	Deuel	Nordquist	3A
Deuel	Stoltenburg	2A	Hamlin	Cox	3A
Lake	Alquire	2A	Lake	Long Lake	3B
Deuel	Severson	2A	Lake	Madison	3C
Moody	Long	2A	Minnehaha	Petri II	3C
Brookings	Goodfellow	2B	Minnehaha	Jordan	3C
Brookings	Errington	2C	Hamlin	Wayrynen	3D
Kingsbury	Shutler	2C	Minnehaha	Wise_becker	3D
Brookings	Bjornlie	2C	Minnehaha	Kindt-Munce	3D
Lake	Katke	2C	Deuel	Kreger	3E
Brookings	Gerdink	2D	Brookings	Pittenger	3E
Lake	Murfield	2D	Lake	Wolf	3E
Miner	Raesley	2D	Minnehaha	Island Lake	3E
Miner	Foos	2D	Minnehaha	Graham	3E
Kingsbury	Muser	2E	Minnehaha	Petri I	3E
Brookings	Brush Lake	2E	Minnehaha	Acheson	3F
Brookings	Cotton	2E	McCook	Lukes	3F
Brookings	Lund	2E	Deuel	Lounsbery	3H
Brookings	Eriksrud	2E	Kingsbury	Schultz	3H
Deuel	Adams	2E	Lake	Gerry	3H
Kingsbury	Apland	2E	Brookings	Bjornlie	3H
Kingsbury	Holland	2E	Lake	Katke	3H
Kingsbury	Neu	2E	Deuel	Bork	3I
Kingsbury	Plum Lake	2E	Brookings	Dry Lake	3I
Lake	Pekarek	2E	Minnehaha	Costello	3I
Miner	South Windedahl	2E	Brookings	Bolstad	3J
Miner	Hein	2E	Brookings	Brookings	3J
Miner	Johnston	2E	Moody	Reaves	3J
Lake	Lake Henry	2E	Moody	Anderson	3J

**Table 9. Assigned priority levels according to the decision tree for prioritizing management of native prairie.**

<i>County</i>	<i>WPA</i>	<i>Priority Code</i>	<i>County</i>	<i>WPA</i>	<i>Priority Code</i>
Moody	Petsch	3J	McPherson	Schafer	1D
Minnehaha	Clear Lake	3J	McPherson	Swisher	1D
Minnehaha	Buffalo Lake	3J	McPherson	West North	1D
Minnehaha	Voelker II	3J	Campbell	BLM-1A	1E
Minnehaha	Lost Lake	3J	Faulk	Lane	1E
McCook	Bank	3J	Faulk	Seidschlaw	1E
McCook	Deneui	3J	Faulk	Stephan	1E
Minnehaha	Schaefer	3J	Faulk	Waldman	1E
Brookings	Kasperson	3J	Faulk	Zell Lake	1E
Brookings	Kasperson	3J	Faulk	Zens	1E
Brookings	Kasperson	3J	McPherson	Adam-Gienger	1E
Lake	Long Lake	4B	McPherson	Bauer-Fischer	1E
<b>Sand Lake WMD</b>			McPherson	Schnabel-Hoff	1E
Campbell	Goetz	1A	McPherson	Eureka Demonstr. Area	1E
Campbell	Cooper	1A	McPherson	Feickert	1E
McPherson	Anderson-Vilhauer	1A	McPherson	Haerter	1E
McPherson	Burrer-Schnabel	1A	McPherson	Helfenstein-Opp	1E
McPherson	Dockter	1A	McPherson	Heyd Lake	1E
McPherson	Eureka Grazing Association	1A	McPherson	Highland	1E
McPherson	Long Lake	1A	McPherson	Job-Anderson	1E
McPherson	Imberi	1A	McPherson	Mehlhoff I	1E
McPherson	Schafer-Schafer-Hoffman	1A	McPherson	Neuharth	1E
McPherson	Weisser	1A	McPherson	Schultz-Reinhold	1E
McPherson	Woehlhoff-Schnabel	1A	Edmunds	Bierman	1E
Edmunds	Bowdle Lake	1A	Edmunds	Hettich	1E
Campbell	Schlomer	1B	Edmunds	Kindlespire-Leboldus	1E
Brown	Hayes	1B	Edmunds	Ryman	1E
McPherson	Buntrock	1B	Edmunds	Mitzel	1E
McPherson	Charley-Harley	1B	Edmunds	Rieger	1E
McPherson	Rau Lake	1B	Edmunds	Stotz	1E
Edmunds	Dewald	1B	Edmunds	Tang	1E
Edmunds	Hosmer	1B	Spink	Jessen	1E
Edmunds	Schurr	1B	Brown	Lord Lake	1I
Edmunds	Stephan North	1B	Brown	Maunu	1I
Brown	Proud	1C	Brown	Engle Dam	1J
Brown	Ristau	1C	Walworth	Leibelt	2A
Edmunds	Anderson	1C	Campbell	Thullner	2E
Edmunds	Stephan South	1C	Campbell	Goehring	2E
Faulk	Christianson	1D	Spink	Boekelheide East	2E
McPherson	10/45	1D	Spink	Boekelheide West	2E
McPherson	Cantwell	1D	Faulk	Voight	2E
McPherson	Ehresman	1D	McPherson	Mettler	2E
McPherson	Hoffman-Gottlieb	1D	Spink	Hahler-Carda	2J
McPherson	Klooz	1D	McPherson	Mettler	3E
McPherson	Mehlhoff II	1D	Spink	Sanderson, Bruckner	3I
McPherson	Perch Lake	1D			

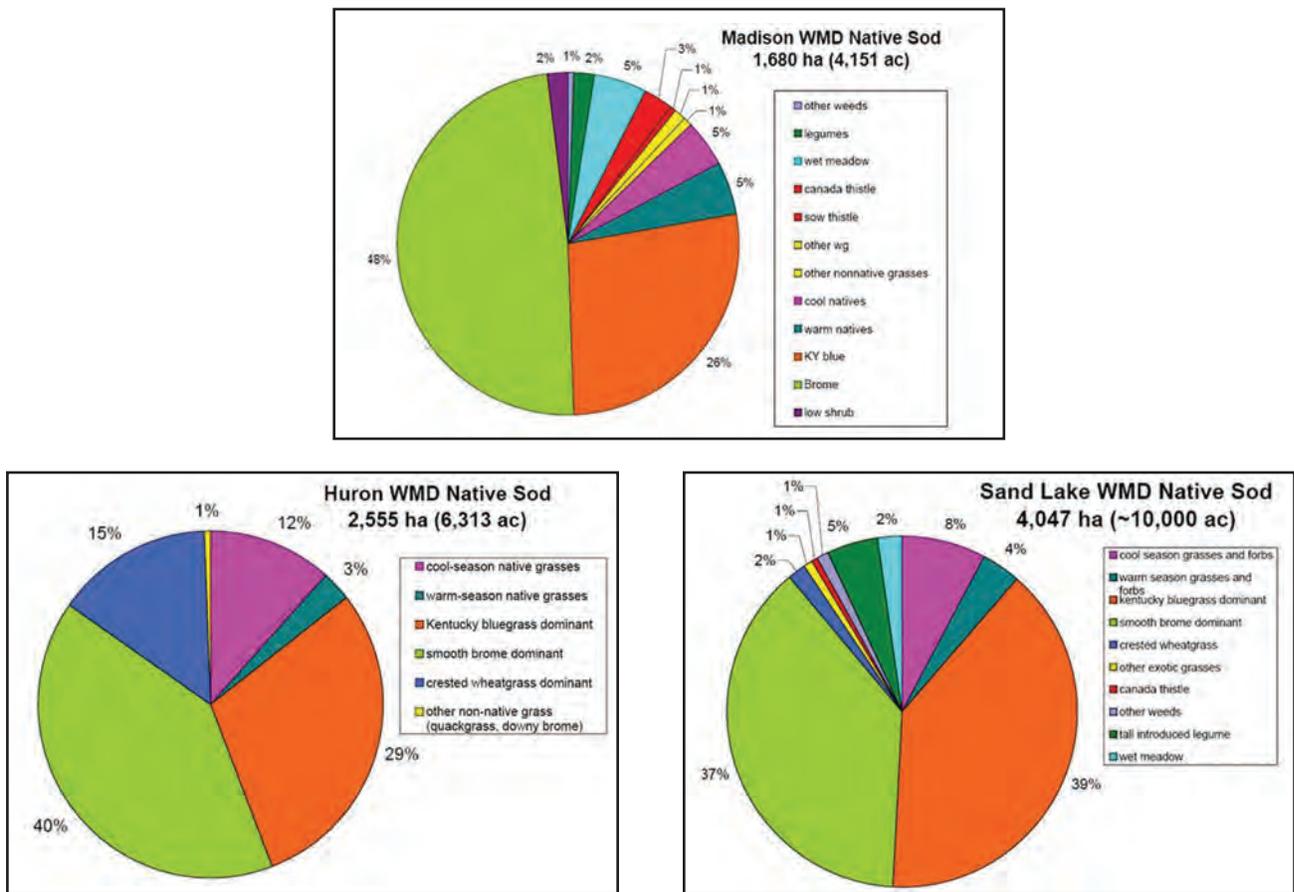


Figure 12. Dominant vegetation community types on native prairie, averaged by district, 2006–2008.

levels from Priority 1A to Priority 4J. This provides each district with a range of flexibility in applying the standardized decision tree. Each district is permitted to individually identify high-priority, moderate-priority, and low-priority levels as outlined in the Native Prairie Restoration Objectives below.

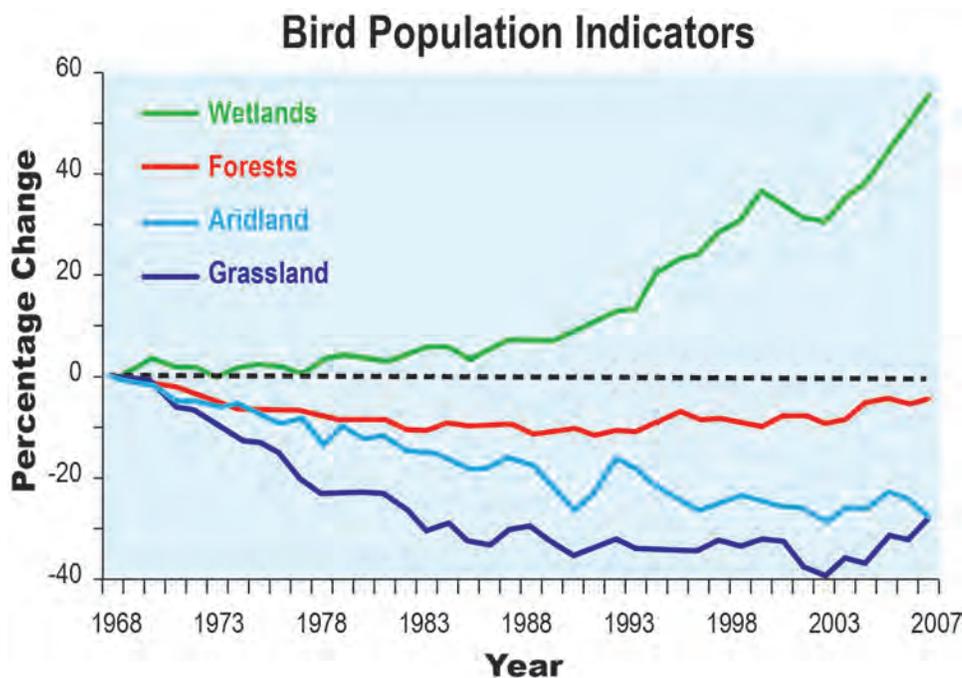
#### Rationale

Most northern mixed-grass and tallgrass prairie has been destroyed. Key roles of the System include conservation of biological integrity, diversity, and ecological health (USFWS 2001a). Accordingly, the Huron, Madison, and Sand Lake WMDs should contribute to the conservation of native prairie communities.

However, Service-owned native prairie is badly deteriorated, mainly through extensive invasion by introduced, cool-season grasses. Recent inventory data suggest that relatively intact native herbaceous flora is uncommon on Service-owned land in the Dakotas, with few remaining large tracts dominated by native grasses and forbs (Grant et al. 2009). Across-district averages based on current inventory data (2008 for the Sand Lake and Madison WMDs and 2006 for the Huron WMD) indicate that native grasses and forbs comprise 12, 10, and 15 percent of the native prairie, respectively (figure 12).

It is likely that some native prairie in the districts has already passed a threshold—in other words, restoration of a modestly diverse, native herbaceous flora in such areas is an unrealistic and impractical goal. Multiple experiments in the northern Great Plains have found that fire and other control methods such as herbicide applications depend heavily for their success on the presence of a minimum of 20% of native species in the matrix (Dill et al. 1986; Willson and Stubbendieck 2000). A grass matrix dominated by a few introduced species inhibits the germination, establishment, and persistence of most native species. However, restoration may be possible on some tracts, especially where native grasses, sedges, and forbs are more common and widespread. Such tracts need to be identified by objective criteria that focus on (1) the diversity and prevalence of existing native plants, and (2) landscape area and connectivity.

Both criteria underlie the quality of nesting habitat for grassland birds, a species guild of significant conservation concern. Grassland birds have become the fastest and most consistently declining guild of birds in North America (figure 13) (Herkert 1995; Knopf 1994; Peterjohn and Sauer 1999; Samson and Knopf 1994; Vickery and Herkert 2001); 48 percent of



**Figure 13. North American bird population indicators based on trends for obligate species in four major habitats (North American Bird Conservation Initiative 2009).**

grassland species are of conservation concern and 55 percent show significant declines (North American Bird Conservation Initiative 2009). As a result, a multitude of grassland-dependent birds are of conservation concern (table 6). Johnson (2006) found that at current rates of decline, within 40 years only 10–25 percent of the population of these grassland bird species will remain. Accordingly, because South Dakota constitutes the central portion of many grassland obligate bird species' geographical ranges (Sauer et al. 2008), managing habitat for grassland birds is of critical importance. Each district has developed a list of focal species it is best positioned to help protect and maintain on the basis of the species' geographic ranges and specialized habitats (table 7).

A recent evaluation of habitat use and requirements for grassland bird species of greatest conservation need in central and western South Dakota provided the following recommendations to managers for preservation and restoration of grassland habitat to help maintain populations of grassland obligate bird species.

To maintain current populations and species diversity, it is critical that managers preserve as much native grassland as possible. Due to the diverse habitat requirements of these species of concern, grasslands should be under varying management regimes including rest, grazing (in varying intensities), mowing, and prescribed burning. Reduction and removal of exotic plant species should be a key element in establishing habitat for grassland obligate species as many were negatively affected by increases in exotic plant coverage. Preserved patches should be large in size

as some species were area sensitive and preferred patches  $\geq 250$ –1,600 ha. Grassland patches should also have little to no woody edge. Finally, these patches should be located in close proximity to one another, or in areas of little fragmentation, to help increase the amount of grassland habitat in the landscape, as many of these grassland bird species were positively associated with the landscape variables, some up to 3,200 meters (Greer 2009).

A fundamental assumption is that, under current management—which lacks an objective, science-based system of identifying and prioritizing restoration of native prairie tracts—native herbaceous flora would continue to decline and disappear. Implementation of the Prioritization Objective and its supporting strategy would improve the chances that some native prairie would be restored.

### Native Prairie Restoration

#### **Native Prairie Restoration Objective 1**

On high-priority native prairie tracts, apply frequent and precisely timed disturbance (principally fire and grazing) to restore vegetation to the following standards within 15 years of CCP approval. This would provide habitat for most wildlife species that were characteristic of South Dakota's eastern prairie regions.

- At 5-year intervals, increase the composition of natives by at least 5 percent.
- At 5-year intervals, maintain or decrease levels of smooth brome to the Huron WMD's 2006 baseline levels and to the Madison and Sand Lake WMDs' 2008 baseline levels.

- No planted shelterbelts or invasive volunteer trees, whether nonnative (such as Russian olive or Siberian elm) or native (such as eastern red cedar), exist on the landscape.

#### Strategies

- On high-priority tracts, disturb the vegetation, typically using livestock grazing or fire, at least 2 of every 3 years.
- Actively participate in the NPAM project throughout its duration to maximize understanding of BMPs (best management practices) for restoration.
- Reseed adjoining old cropland units into native vegetation that includes cool-season and warm-season grass components, as well as a native forb component. Manage these intensively, in concert with the high-priority tracts they adjoin, to sustain a native-dominated flora and to reduce sources of invasion by introduced cool-season grasses and noxious weeds (see Tamegrass Objective 1).
- Experiment on low-priority tracts with new or high-risk restoration methods for use on high-priority tracts.
- Experiment with control of introduced, cool-season grasses and subsequent release of native plants on a small, localized scale with selective herbicide treatment.
- Periodically survey for noxious weeds. Use herbicides, mechanical treatment, or biological control as needed, especially along boundaries with private lands.
- Avoid herbicides that are unnecessarily detrimental to native forbs. Stay abreast of advancements in chemical herbicides that increasingly do a better job of targeting State-listed noxious species while leaving desirable native forbs unharmed.
- Remove local human disturbances and artifacts of twentieth-century origin. These include rock piles, junk piles, and old machinery. Restore such sites as close as possible to their original condition.
- Experiment with noninvasive methods to interseed native plants into heavily invaded native prairie, such as prescribed fire followed by seeding with a grass drill.
- *NOTE: Service policy regarding refuge management implicitly promotes seeding to reestablish native plants in native prairie where such plants have become rare or absent (National Wildlife Refuge System Biological Integrity, Diversity, and Environmental Health [BIDEH], 601 FW 3, 2001).*

#### Rationale

##### Native Prairie Restoration

One of the most important management standards of the Improvement Act is a provision directing the



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*The short-eared owl is a focal grassland species.*

Secretary of the Interior to “ensure that the biological integrity, diversity, and environmental health of the System are maintained for the benefit of present and future generations of Americans” (ecological integrity provision). With the exception of the System mission, the ecological integrity provision is the most important and pervasive provision of the Improvement Act. Maintaining the biological integrity, diversity, and environmental health of protected lands is a fundamental concept widely recognized as basic to modern scientific resource management, and by virtue of the Improvement Act, the Service now has a fundamental legal duty to do so.

This objective focuses on restoration and maintenance of the floristic composition on tracts identified as high priority on the basis of criteria used to determine their restoration potential.

A fundamental assumption is that, with continued management focused on vertical structure over other prairie qualities and values, native herbaceous flora would continue to decline and disappear on native prairie tracts. Native Prairie Restoration Objective 1 would improve the chances that some native prairie would be restored on high-priority tracts by applying frequent and precisely timed disturbance.

Over the last several decades, rest (that is, lack of grazing, haying, and prescribed fire) was emphasized as a management approach to increase densities of duck nests in uplands on WPAs in the Dakotas. In the short term (2–20 years), greater vertical structure may be maintained in northern grasslands that are rested. The structure of such idle vegetation is believed to be more important than plant species composition when the management goal is waterfowl production, in part because the density and survival of nests of prairie ducks are believed to be greatest on rested grasslands (Naugle et al. 2000; Schranck 1972).

However, a management approach for upland-nesting duck habitat that emphasizes rest has long-term implications that are often overlooked in short-term management studies, because continuous idling



Bridgette Flanders-Wanner/USFWS

*Prairie habitat on the Sluenecka Waterfowl Production Area.*

without periodic defoliation disturbance fails to promote long-term grassland health (Naugle et al. 2000). With extended rest, introduced grasses, especially smooth brome and Kentucky bluegrass, may more rapidly displace native vegetation (Murphy and Grant 2005). Monotypic stands of smooth brome and Kentucky bluegrass are less attractive to upland-nesting ducks than other types of grass-forb cover (Nenneman 2003).

Studies conducted on exotic plant species and habitat quality for grassland birds have shown that grassland bird species richness and/or abundance are lower in grasslands dominated by exotic species than in grasslands containing native species (Bakker and Higgins 2009; Greer 2009; Lloyd and Martin 2005; Pampush and Anthony 1993; Wilson and Belcher 1989). Recent South Dakota research reported that increasing coverage of grasslands by exotic plant species had a negative effect on the occurrence and/or densities of four of South Dakota's species of greatest conservation need—chestnut-collared longspur, western meadowlark, grasshopper sparrow, and lark bunting (Greer 2009). Bakker and Higgins (2009) found that intermediate wheatgrass monotypes and cool-season mixes of exotic species in South Dakota contained 40–60 percent fewer grassland bird species than did native sod prairie. Ribic et al. (2009) found that grasshopper sparrows occurred in higher densities in native prairie remnants with greater native plant coverage than in CRP fields or hay fields containing greater amounts of exotic species. Increased vegetative heterogeneity in tracts of native sod prairie may support more arthropod prey for grassland birds (Hickman et al. 2006; McIntyre and Thompson 2003); arthropod prey diversity is positively associated with grassland bird richness (Hamer et al. 2006).

Losses of plant, bird, and arthropod species diversity are not the only consequences when introduced plants invade northern prairie. The long-term effect of introduced perennials does more than simply determine species composition; it also affects ecosystem processes

(Wilson 2002). Ecosystem processes such as nutrient cycling and water-use patterns in prairies dominated by smooth brome and Kentucky bluegrass differ from those in native grasslands (Hunt et al. 1991; Trlica and Biondini 1990). Nutrient pools, energy flows, soil invertebrate and mycorrhizal relationships, and the water cycle can all be altered significantly (Christian and Wilson 1999; Seastedt 1995; Vinton and Goergen 2006; Wilson 2002).

In efforts to emulate these natural regimes that sustained wildlife populations prior to pioneer settlement, land managers must attempt to simulate the ecological processes that maintained the habitat prior to settlement. A strategy to improve competitive advantages of native herbaceous plants should match the types, timing, and frequencies of prescribed disturbances to those under which these plants evolved. Several sources indicate that native grasslands devoid of grazing and fire deteriorate quickly (Anderson et al. 1970; Kirsch and Kruse 1973; Kirsch et al. 1978; Schacht and Stubbendieck 1985). The grasslands function similarly to living organisms in that they respond to activities within the ecosystem. Specifically, the forbs and grasses covering the landscape have developed biological adaptations to thrive in the presence of herbivory and fire. Wildlife managers use various tools—including prescribed fire and prescribed grazing—to emulate the defoliation process with which prairie plants evolved. The frequency of certain activities depends on the particular habitat components. For instance, a pristine native prairie tract may require a burn every 3–5 years and intermittent, prescribed grazing of domestic cattle, whereas areas that are heavily invaded require more frequent management treatments. Prescribed burning, mowing, and herbicide application can reduce the abundance of smooth brome, but without sustained control efforts, the species is remarkably persistent (Willson and Stubbendieck 2000).

In determining restoration actions, vegetation composition is considered along a habitat continuum, where plant communities can be separated by degree of invasion by undesirable plants. A continuum for native prairie in eastern South Dakota (beginning with the least desirable vegetation) could be shown as: noxious weeds (e.g., Canada thistle or leafy spurge) → nonnative, woody species (e.g., Russian olive, Siberian elm) → invasive, volunteer woody species (e.g., eastern red cedar) → smooth brome → Kentucky bluegrass → native low shrubs (e.g., western snowberry) and native herbaceous vegetation. With management, less desirable plant species are replaced by more desirable plant groups. For example, it is acceptable in the short term to increase Kentucky bluegrass in areas where leafy spurge is reduced. Conversely, replacement of Kentucky bluegrass by smooth brome is undesirable.

Therefore, restoration management should focus more on strategies to reduce smooth brome. Smooth



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*An upland sandpiper surveying its habitat from a convenient vantage point.*

brome generally seems more difficult to control than other introduced cool-season grasses (Murphy and Grant 2005). Smooth brome, Kentucky bluegrass, and crested wheatgrass are all “strong invaders” (Ortega and Pearson 2005), able to become community dominants and form nearly monospecific stands. However, smooth brome more significantly alters the quality and structure of native prairie than does Kentucky bluegrass (Blankespoor 1987); may have a competitive advantage over native grasses, particularly in high nitrogen soils (Vinton and Goergen 2006); and can modify soil microbiota to directly facilitate its own invasion and subsequently impede restoration of native communities (Jordan et al. 2008).

A strategy to decrease the competitive abilities of Kentucky bluegrass and smooth brome should focus on the combined use of prescribed fire and prescribed grazing. Kentucky bluegrass responds well to fire, decreasing in abundance as fire frequency increases until it is nearly absent in annually or biannually burned plots in both low-productivity (Knops 2006) and high-productivity prairies (Smith and Knapp 1999; Towne and Owensby 1984). Fire has the greatest negative effect on Kentucky bluegrass during stem elongation or in dry years (Murphy and Grant 2005). Conversely, Kentucky bluegrass tends to increase under prolonged rest or with grazing (Murphy and Grant 2005). Smooth brome also increases under rest but, in contrast to Kentucky bluegrass, appears sensitive to repeated grazing but unaffected or variably affected by prescribed fire (also reviewed in Murphy and Grant 2005). Periodic monitoring will ensure that the appropriate management treatment is applied for the invasive species and severity of the infestation on the given management unit.

Historically, the prairie was a treeless landscape. Trees and tall shrubs can diminish the survival of nests of grassland birds by harboring potential nest predators. They also provide perches from which brown-headed cowbirds can find other species’ nests in

which to lay eggs. Relatively small areas of tall woody vegetation can effectively fragment grassland habitats and cause many grassland bird species to avoid entire landscapes. Based on these findings, elimination of tall woody cover is a logical strategy for restoration of landscape structure and plant community composition, as well as a means to improve the attractiveness and security of the habitat for a variety of grassland-breeding bird species.

#### Wildlife Response

Although the focus of this objective is the restoration and maintenance of floristic composition in native prairie, wildlife would also benefit. The contemporary breeding bird community on WPAs in eastern South Dakota is characterized by species that tolerate introduced, cool-season grasses and relatively tall, dense, herbaceous cover. Habitat for a broader array of northern prairie birds (including several endemics and other species characteristic of the historical native prairie community) may be significantly increased by providing frequent disturbance and the resulting increases in early successional stages.

Nevertheless, there are often tradeoffs in wildlife response to consider when reintroducing major habitat disturbances such as fire and grazing; short-term losses should be weighed against net gains over longer periods. For example, management treatments might influence the survival of grassland bird nests—directly by burning nests or through livestock trampling, or indirectly through increased predation or brood parasitism rates—when nest site vegetation is modified by fire or grazing.

Despite declines in densities during the first growing season following a prescribed burn, Murphy et al. (2005) found that most species of breeding grassland birds in northern mixed-grass prairie are adapted to recurring fire (every 4–6 years) by nesting in unburned patches and returning to pre-burn levels of abundance and nest density after the first growing season. Further, the authors found that fire had almost no discernible impact on nest survival for all species of grassland birds examined, with the exception of the Savannah sparrow in the first post-burn growing season.

Murphy et al. (2005) found similar results for waterfowl; duck nest densities were reduced during the first growing season following a fire, but recovered 2–3 years post-fire. Similarly, Kruse and Bowen (1996) found that grazing alone reduced nest densities during the grazing years, but the vegetation and ducks recovered quickly after grazing ended. However, studies of nesting success have reported neutral to positive responses of waterfowl to grazing and prescribed fire. Murphy et al. (2005) found greater nest survival for mallards and gadwalls during the first post-fire growing season than in subsequent years and no fire effects on nest survival in other duck species,



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*A badger on the move in prairie habitat.*

regardless of how recently fire had occurred. Kruse and Bowen (1996) found that waterfowl nest success was not influenced by burning and grazing treatments, while several studies have reported greater nesting success in grazed grasslands than in other habitats in the Prairie Pothole Region (Barker et al. 1990; Greenwood et al. 1995). Warren et al. (2008) found that nesting females were most successful at sites with above-average vegetation density that are in fields with increased grazing intensity (that is, nesting in clumps of vegetation in areas more generally characterized by low levels of residual cover). Grazed areas may attract fewer predators because of low densities of some types of prey, such as small mammals (Grant et al. 1982; Runge 2005); less cover for concealment; or both. Higher nesting success in grazed fields may occur because predators respond negatively to low prey density (Clark and Nudds 1991; Larivière and Messier 1998).

### **Native Prairie Restoration Objective 2**

Moderate tracts are managed as high-priority tracts as funding and staff time permits. In years with insufficient budgets or staff resources, moderate tracts are managed as low-priority tracts.

### **Native Prairie Restoration Objective 3**

On low-priority native prairie and smooth brome-dominated tracts, apply disturbance approximately every 4–7 years to remove plant litter, restore plant vigor, reverse woody plant expansion, and provide a mix of structural types that include (1) tall/dense vegetation for species such as mallard, northern harrier, gadwall, and bobolink; (2) vegetation of medium height and density for species such as blue-winged teal, short-eared owl, northern shoveler, northern pintail, and grasshopper sparrow; and (3) relatively short/sparse vegetation for species such as upland sandpiper, willet, marbled godwit, and chestnut-collared longspur.

There is almost no monitoring of vegetation on these tracts except for routine, cursory surveillance

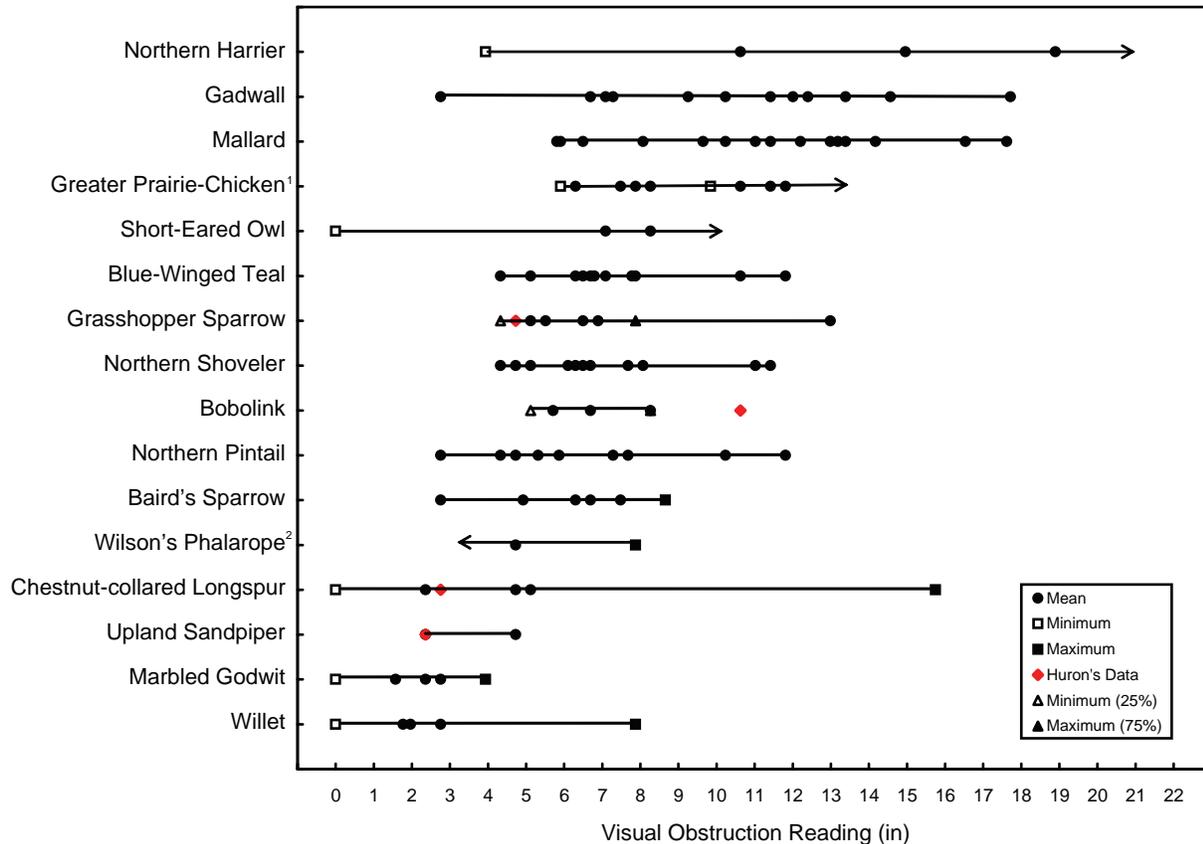
for noxious weeds. Nevertheless, knowledge of the relationship between disturbance (that is, any management treatment or natural event that results in the significant removal of vegetative biomass) and the resulting post-disturbance vegetation structure enables land managers to predict the habitat conditions described below. Vegetation should exhibit these characteristics within 15 years of CCP approval.

At least 50 percent of the total acreage of low-priority native prairie is in a condition of 4–7 years post-disturbance, at least 25 percent is in a condition of 2–3 years post-disturbance, and less than 25 percent is in a condition of 0- to 1-year post-disturbance. These characteristics correspond roughly to structural categories, measured as VOR (visual obstruction reading) of at least 7 inches, 4–7 inches, and less than 4 inches (Robel et al. 1970). Such a distribution, or mosaic, of structural conditions is desirable to meet the needs of a wide array of grassland-nesting birds (figure 14).

No invasive, volunteer trees exist on the landscape, whether nonnative (for example, Russian olive, Siberian elm) or native (for example, eastern red cedar). Removal of shelterbelts is not required as it is on high-priority tracts.

### **Strategies**

- Manage tracts or portions of tracts with prescribed fire, grazing, or haying.
- Burn opportunistically at any time, mainly to remove litter and control invasive, volunteer trees. Similarly, utilize livestock grazing with wide latitude on timing, intensity, and duration, mainly to remove litter and promote tillering (sending forth new shoots that sprout from the base of a grass) to improve plant vigor.
- Experiment on low-priority tracts with new or high-risk restoration methods, including seeding or “interseeding” of native grasses and forbs, mainly to help develop effective restoration approaches for high-priority units.
- Periodically survey for noxious weeds. Use herbicides, mechanical treatment, or biological control as needed, especially along boundaries with private lands.
- Avoid herbicides that are unnecessarily detrimental to native forbs. Stay abreast of advancements in chemical herbicides that increasingly do a better job of targeting State-listed noxious species while leaving desirable native forbs unharmed.
- Remove invasive, volunteer trees with a chainsaw, roller chopper, or other effective method of mechanical removal. Individual volunteer trees should be checked for the presence of migratory birds nests before removal. All tree removal activities will be conducted in accordance with the September 23, 2010, policy and guidance (appendix I).



**Figure 14. Quantitative measurements of visual obstruction readings of upland nesting species (Laubhan et al. 2006, except [1] Svedarsky et al. 2003 and [2] Dechant et al. 1999).**

#### Rationale

By 2 years after CCP approval, district staff would have identified high-priority native prairie tracts to manage for biological integrity, ecological diversity, and environmental health. This would improve the chances of restoring at least some native prairie by more intensively managing these areas. It is likely that low-priority native prairie tracts have already passed a threshold—in other words, restoration of a modestly diverse, native herbaceous flora in such areas is an unrealistic and impractical goal. However, with modest effort, the prevalent, introduced cool-season grasses can be managed to provide structural diversity, emphasizing structure that is tall/dense to medium for nesting waterfowl and apposite grassland-dependent birds.

Structural habitat preferences of bird species vary widely. It is assumed that the needs of all species would not be met on a single tract or management unit, but rather the needs of various species groups would be met by providing a mosaic of vegetative structures (tall/dense, medium, and short/sparse) across many tracts in the districts. Because WPAs are “waterfowl first” lands, it is appropriate to manage for a high percentage of tall/dense and medium VOR acres (at least

50 percent and at least 25 percent, respectively) and low percentage of short/sparse VOR acres (less than 25 percent). South Dakota’s five most abundant species of upland-nesting ducks (gadwall, mallard, blue-winged teal, northern shoveler, and northern pintail) prefer vegetation structure (as defined by VORs) in the medium (4–7 inches) and high (more than 7 inches) categories (Laubhan et al. 2006).

Management of low-priority units for taller, denser vegetation (see Planted Grassland Objectives) can increase grassland habitat diversity across WPAs by providing a tallgrass prairie component for waterfowl. This may be increasingly important as vegetation height and density are reduced on much of the high-priority units. Such reduction results from the frequent and intensive management treatments to effectively restore native prairie and address the needs of a broader suite of grassland birds.

#### Dakota Skipper

The Madison and Sand Lake WMDs contain habitat suitable for Dakota skipper; occurrences are documented in Edmunds County in the Sand Lake WMD and Hamlin and Deuel counties in the Madison WMD (figure 15). Dakota skipper is likely to occur only in scattered remnants of high-quality native prairie

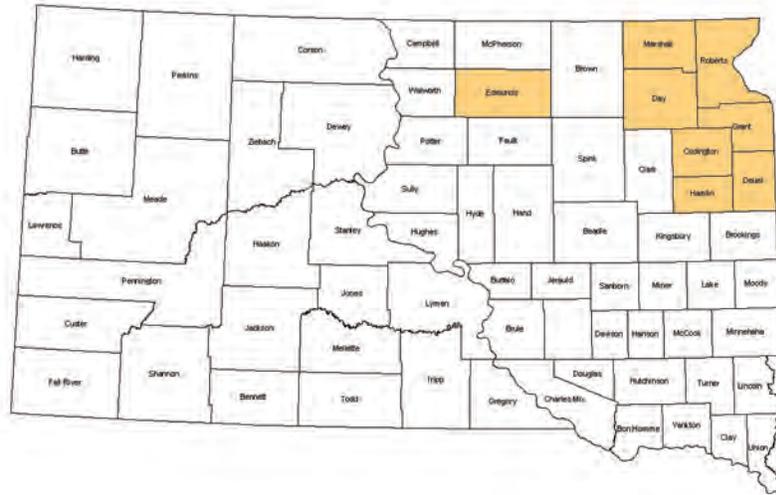


Figure 15. Known Dakota skipper locations in South Dakota by county (USFWS 2002b).

across a vast area of grassland in the north-central United States and south-central Canada. The most significant remaining populations occur in western Minnesota, northeastern South Dakota, north-central North Dakota, and southern Manitoba. The species' current distribution straddles the border between tall-grass and mixed-grass prairie; it occurs in two types of habitat (USFWS 2002a):

- Flat, moist, native bluestem prairie in which three species of wildflowers are usually present—wood lily, harebell, and smooth camas.
- Upland (dry) prairie that is often on ridges and hill-sides; bluestem grasses and needlegrasses dominate these habitats and three wildflowers are typically present in quality sites—pale purple coneflower, upright coneflower, and blanketflower.

Dakota skipper is a candidate for listing under the Endangered Species Act. Candidates are species for which the Service has information to support the listing of this species, but other species have higher priority for listing. Dakota skipper received a priority of 11 on a scale of 1–12.

#### **Dakota Skipper Objective**

At 5-year intervals, reevaluate native prairie areas larger than 80 acres in WPAs for suitability as Dakota skipper habitat on the basis of new species composition data. Manage sites deemed suitable for Dakota skipper (tier 2, after Murphy 2005) in accordance with its habitat needs, according to “The Conservation Strategy & Guidelines for Dakota Skippers on Service Lands in the Dakotas.” Within 5 years of classification, survey sites one or more times to document Dakota skipper presence or absence.

#### **Strategies**

- Use vegetation data to reevaluate vegetative species composition.
- Systematically survey for Dakota skipper using either the checklist or Pollard Walk methods (Royer et al. 1998). Contract survey work to qualified lepidopterists.

#### **Rationale**

Dakota skipper populations have declined due to widespread conversion of native prairie for agricultural and other uses, leaving the remaining skipper populations isolated from one another in relatively small areas of remnant native prairie. In addition, many of the habitats where the species persists are threatened by overgrazing, conversion to cultivated agriculture, inappropriate fire management and herbicide use, woody plant invasion, and invasive plant species.

Dakota skipper's historical range is not known precisely, because extensive destruction of native prairie preceded widespread biological surveys in central North America. Although this butterfly likely occurred throughout a relatively unbroken and vast area of grassland in the north-central United States and south-central Canada, it now occurs only in scattered blanketflower remnants of high-quality native prairie. Scientists have recorded Dakota skippers from northeastern Illinois to southern Saskatchewan. Dakota skippers now occur no farther east than western Minnesota, and scientists presume that the species has been extirpated in Illinois and Iowa.

The Madison and Sand Lake WMDs contain habitat capable of supporting Dakota skippers; these lands need to be systematically surveyed in an attempt to document the presence or absence of the species. Periodic reevaluation (every 5 years) of native prairie

WPAs must be performed to capture changes in species composition that occur over time as a result of management, climatic changes, and other factors (such as new infestations by invasive plants).

## Upland Management

### *Upland Management Objective*

Enhance grassland systems in an ecosystem management context through the use of prescribed fire and grazing, applied scientifically under selected weather and environmental conditions. The use of fire should increase by 25 percent above levels in the 2006–2008 field seasons to accomplish habitat management objectives. Grazing and fire will be symbiotically incorporated into grassland management to maximize management efficacy.

### *Strategies*

The strategies listed below are applicable to all habitats in the three districts based on the priority system.

- Use prescribed fire and grazing to maintain grassland health in restoration areas (stimulating native plant growth, increasing seed germination, supporting nutrient cycling, and reducing organic litter accumulation).
- Apply fire and grazing at various times (spring–fall) to benefit phenology of native plant species (cool- and warm-season species).
- Implement a patch-dynamic approach to grassland management to improve ecosystem function.
- Use fire to prevent encroachment of woody-stemmed plants and invasive tree species.
- Use fire to combat the invasion of cool-season exotic grasses (smooth brome and Kentucky bluegrass) and thus maintain the integrity of grassland restorations.

### *Rationale*

The prairie evolved through the interactions of a drying climate, herbivory, and fire (Anderson 1990; Axelrod 1985; Pyne 1982, 1986; Sauer 1950; Webb 1983; Wells 1970). Grasslands are disturbance-dependent systems that are significantly affected by the presence or absence of these disturbances. Without disturbance, grassland systems degrade and lose functionality.

The accumulation of plant litter adversely affects the system functions of a grassland. According to Knapp and Seastedt (1986), plant litter limits available light energy input into the system; alters the microclimate and physiology of emerging shoots such that CO<sub>2</sub> uptake is reduced; limits intake of inorganic nitrogen from rainwater as well as nitrogen fixing by free-living microbes and blue-green algae; and reduces soil temperature. These conditions diminish root productivity as well as invertebrate and microbial activities. Gibson and Hulbert (1987) determined that

in tallgrass prairie, the diversity and percent cover of warm-season grasses decreases as time increases since fire occurrence. Briggs and Gibson (1992) determined that tree invasion is a function of the burning regime, dispersal vectors, habitat availability, and reproductive mode.

Historically, fires were intermittent, occurring throughout the year (Jackson 1965). The timing of fire application affects the vegetation response. The greatest response to fire is observed in species that are approaching the initiation of spring growth when the treatment occurs (Towne and Owensby 1984). Treating grasslands with fire at different times in the seasonal cycle facilitates the manipulation of species composition. Additionally, the application of fire in the spring and fall negatively affects woody seedlings or saplings while increasing the productivity of many prairie forbs and grasses (Collins 1987; Collins and Wallace 1990; Hill and Platt 1975; Hulbert 1969, 1986; Knapp 1984, 1985; Knapp and Seastedt 1986; Old 1969; Peterson 1983). Grassland integrity and health cannot be achieved without restoring fire to the landscape.

Herbivory can change plant species composition. Selective foraging, which decreases the presence of preferred forage species while increasing the presence of those not selected (Howe 1994), can affect the occurrence of individual species and determine species dominance in grasslands. The species of herbivore and the timing and density of prescribed grazing determines the magnitude and specific effect on the target area.

The interaction of grazing and fire affects community structure differently than either alone (Collins and Barber 1985; Collins and Uno 1983). Grazing and fire affect the nitrogen cycling process that occurs belowground, creating a shifting mosaic of vegetation (Johnson and Matchett 2001). The interaction of grazing and fire can be maximized using a patch-dynamic approach. Fuhlendorf and Engle (2004) determined that the “patch-burn-graze” approach created a shifting mosaic of vegetation across the landscape and Vermeire et al. (2004) described the ability of a “patch-burn-graze” system to create vegetative structural heterogeneity. A holistic approach to grassland management should include both forms of disturbance. The timing, frequency, intensity, and interaction of these ecological processes shape the community structure and species composition.

### **Invasive and Planted Woody Vegetation on WPAs**

Historically, the northern Great Plains was a grassland-dominated ecosystem where fire and grazing restricted natural tree growth to riparian floodplains, wooded draws, islands in lakes, and small patches along leeward wetland edges (Higgins 1986). These patches and corridors of trees and shrubs were the only woodland features in the prairie landscape (Rumble et al. 1998).

The prevalence of fire in the presettlement prairie created an environment inhospitable to trees (Higgins 1986; Severson and Sieg 2006). The growing points of most grassland species are usually protected at the base of the plant. In contrast, woody vegetation possesses elevated growing points that are more vulnerable to injury or fatality from fire. Grassland plants persist and expand with frequent and repetitive burns, whereas woody plants tend to decrease (Vogl 1974). The tallgrass and mixed-grass prairie types that cover South Dakota produce large quantities of fuel that dry quickly and burn easily (Steuter and McPherson 1995). Specifically, bluestem prairies recover quickly post-fire and can even provide enough fuel for multiple burns in a single growing season (Bragg 1982).

Climate also played a pivotal role in the development of grasslands—particularly the limiting effect of periodic drought on the growth and expansion of trees (Weaver and Albertson 1936). Herbivory and hoof action of grazing animals also constrained the establishment and expansion of woody vegetation. The effects of ungulates, fire, and drought combined to inhibit tree growth and expansion across the grasslands of South Dakota.

Presently, however, grassland fragmentation is escalating at an alarming rate. During 2008, in eastern South Dakota, the USDA and County Conservation Districts planted 255 miles of trees, covering 2,801 acres of land with 1,115,780 trees (G. Yapp, USDA, personal communication, 2009).

The response of grassland birds to unnatural tree conditions has received recent research emphasis. Grant et al. (2004) determined that the probability of occurrence of breeding grassland birds decreased notably for 11 species as the percentage of woody vegetation increased. Further, negative effects on grassland bird communities increased as the height of woody plants increased (that is, brush giving way to tall shrubs giving way to trees). By most accounts, the grasslands became unsuitable for nine species of grassland birds as woodland cover exceeded 25 percent (Grant et al. 2004b). A recent study in the Dakotas determined that bobolink, Savannah sparrow, and sedge wren specifically avoided tree plantings; however, these species would utilize the same areas after tree-belts were removed (Naugle and Quamen 2007).

Nest predators and nest parasite species increase near woody habitat edges (Burger et al. 1994; Johnson and Temple 1990); in other words, planting woody vegetation in previously treeless grasslands exacerbates these problems. Tree plantings in grasslands create den and foraging sites for predators historically uncommon to grasslands (Kuehl and Clark 2002; Pedlar et al. 1997; Sargeant 1972; Sargeant et al. 1987). Gazda et al. (2002) indicated that duck nest success decreases near planted woodlands as a result of increased predation by mammal and bird species associated with

trees and shrubs. Waterfowl and waterbirds have been shown to avoid wetlands where trees and shrubs occur along wetland margins, presumably to evade predation (Rumble and Flake 1983; Shutler et al. 2000). Johnson and Temple (1990) determined that nest predation rates were lower for five species of grassland songbirds in areas where nests were more than 148 feet from woody vegetation.

Brown-headed cowbird is a nest parasite whose population has increased in recent decades to the detriment of other birds (Shaffer et al. 2003). Cowbirds lay eggs in the nest of other birds, and the host birds act as foster parents to the cowbird young, thus reducing survival of the host bird's young (Lorenzana and Sealy 1999). Studies in mixed-grass prairie and tallgrass prairie determined that grassland birds nesting close (less than 541 feet [165 meters]) to wooded edges incur higher rates of brood parasitism from cowbirds than nests farther away (Johnson and Temple 1990; Patten et al. 2006; Romig and Crawford 1995). Shaffer et al. (2003) documented that brown-headed cowbirds parasitize 24 of the 36 North American grassland bird species.

Service-owned lands in South Dakota are part of this historically grassland-dominated ecosystem, where fire, grazing, and drought restricted natural tree growth to limited areas (Higgins 1986). Now, planted or volunteer trees and shrubs occur in many WPAs. Although most woody plantings existed before Service ownership of these lands, the Service did establish tree planting after acquisition in attempts to improve wildlife habitat. Volunteer trees are prevalent primarily due to lack of fire. Planted trees and shrubs such as green ash, cottonwood, and buffaloberry are native to North America; however, many others, such as caragana, Russian olive, and Siberian elm, are non-native species. The most troublesome species planted in South Dakota is eastern red cedar. The species' extreme adaptability has enhanced the spread of these trees into areas where they were formerly rare or absent. Additional increases in their spread are due to tree plantings and the selection of the most aggressive cultivars (Ortman et al. 1996). Most of these plantings are considered unnatural components of the historical habitat. Additionally, nonnative species such as Russian olive and Siberian elm are invasive and also readily spread from both Service-owned and non-Service-owned plantings into new areas.

Preventing the encroachment and planting of woody vegetation into grassland ecosystems contributes significantly to the recovery of grassland bird populations (Herkert 1994). Recent research indicates that the elimination and reduction of invasive and planted woody vegetation will benefit most grassland-dependent bird species (Bakker 2003; Grant et al. 2004b; Johnson and Temple 1990; Naugle and Quamen 2007; Patten 2006 et al; Shaffer et al. 2003; Sovada et al.



Bridgette Flanders-Wanner/USFWS

*Invasive nonnatives such as this Russian olive tree can degrade prairie habitat if they remain unchecked.*

2005). Although many woodland bird species might nest in planted woodlands, few are of management concern (Kelsey et al. 2006), suggesting that the loss of planted woodlands will have negligible effects on woodland bird species whose populations are stable or expanding.

In view of the research that has highlighted the deleterious effects of woody vegetation on prairie ecosystems, systematic removal of invasive and planted woody vegetation from Service lands is critical to the improvement of habitat for grassland-dependent birds. Sites for tree removal on WPAs are prioritized on the basis of landscape characteristics; the majority of removal is targeted in areas with the largest blocks of grassland, with emphasis on native prairie tracts and areas to be restored to planted native vegetation. Reducing fragmentation in these core areas has the potential to provide the most benefits to grassland-dependent birds. In addition, the removal of woody species more than 3.28 feet (1 meter) tall should target the removal of the larger shrubs and trees that pose the greatest ecological threat to grassland ecosystems on Service lands, rather than on small native shrubs, such as prairie rose, leadplant, and western snowberry, which are an important component of grassland ecosystems.

#### ***Invasive and Planted Woody Vegetation Objective***

Over a 15-year period, remove invasive or planted woody vegetation on a minimum of two sites per year on priority units (based on the ability to remove woody vegetation across the landscape such that doing so will create larger blocks of habitat for grassland birds).

#### ***Strategies***

- Cut standing trees and shrubs and remove belowground woody material (stumps and roots) using chainsaws and a variety of heavy equipment. Where removal of stumps and roots is not viable, herbicide treatment may be necessary for control.
- Apply herbicides in situations where suckering occurs or is anticipated.
- Pile and burn downed woody material.
- Use high-intensity spring or fall fires to initially kill trees within 4 years. Then use fire or herbicides to reduce viability of recurring growth. Continue control of trees and tall shrubs with periodic fire (every 3–6 years).
- Plan and conduct tree removal to minimize the impacts on nesting migratory birds. If it is determined that these activities will be conducted during the nesting season, they will be limited to sites where improvements to the ecological integrity of the site will outweigh the short-term losses of individual birds.
- Restore bare areas resulting from woody vegetation removal to perennial grass cover.
- Due to the potential controversial nature of this management strategy, conduct outreach and appropriate education to the relevant local communities, politicians, media, and other interested parties.
- Use appropriate bird survey methods to monitor bird response to removal of woody vegetation.

#### ***Rationale***

Prior to Euro-American settlement in South Dakota, woody vegetation primarily occurred in riparian or

streamside areas in broken topography in the upper drainages of streams, as well as on escarpments and in sandhills. These areas often had increased soil and foliar moisture, standing water, and relatively steep topography that provided protection from fires (Severson and Sieg 2006).

Although numerous patches of native woodlands still exist in the northern Great Plains, today, large expanses of once nearly treeless prairie are now intermixed with cropland and scattered small (less than 5 acres) linear and block-shaped tree plantings (also commonly referred to as windbreaks, shelterbelts, and tree belts). Baer (1989) estimated that these plantings cover 3 percent of the landscape in the State. Tree plantings are designed to reduce soil erosion from croplands (Baer 1989) and to provide shelter for farm sites and livestock, and are viewed by many as striking landscape features that symbolize settlement of the western United States. However, they also further fragment remaining grasslands by creating abrupt boundaries that exacerbate edge effects (O’Leary and Nyberg 2000; Ribic and Sample 2001; Winter et al. 2000). Additionally, the suppression of ecological processes such as fire and grazing has allowed an increase in the encroachment of woody plants into grasslands (Bakker 2003). These factors have been linked to the deterioration of grassland bird populations, which are declining faster and more consistently than any other group of North American birds (Herkert 1995; Samson and Knopf 1994). Research indicates that native grassland birds need large, contiguous tracts of treeless grasslands to maintain populations (Bakker et al. 2002; Herkert 1994; Winter et al. 1999). The literature overwhelmingly indicates that invasive and planted trees in prairie landscapes often adversely affect a variety of bird groups (Bakker 2003). Specifically, trees on the prairie are correlated with adverse consequences for ducks (Rumble and Flake 1983), wetland birds other than ducks (Naugle et al. 1999), prairie grouse (Hanowski et al. 2000; Niemuth 2000), grassland songbirds (Grant et al. 2004b; Winter et al. 2000), and ring-necked pheasant (Schmitz and Clark 1999; Snyder 1984).

## PLANTED GRASSLANDS GOAL

*Manage planted grasslands to contribute to the production and growth of continental waterfowl populations, other migratory birds, threatened and endangered species, and other wildlife.*

### Prioritization

#### **Planted Grasslands Prioritization Objective**

Implement the standardized, science-based prioritization decision tree developed for the CCP (figure 16) so that limited funding and management resources are objectively allocated to planted grasslands according to the potential for that tract to benefit waterfowl and

grassland birds. Allocate limited resources to planted grasslands as outlined in the Planted Grasslands Management Objectives below. Allow each district to further refine the prioritization system as additional biological information becomes available; reevaluate the prioritization system 15 years after CCP approval.

### Strategies

- Apply multiple selection criteria for prioritizing planted grassland tracts according to the decision tree (figure 16) and as summarized below.
  - Primary Criterion—Duck Pairs per Square Mile. This criterion is divided into four levels of priority—at least 60, at least 40, at least 25, and fewer than 25 duck pairs per square mile—that match the Service’s Grassland Easement Priority Zones (Ron Reynolds, USFWS, HAPET, personal communication, 2010).
  - Secondary Criterion—Percent Grass on the Landscape. The surrounding landscape is categorized as high or low grass composition—at least 40 percent or less than 40 percent grass. This criterion coincides with requirements for maintenance levels of waterfowl nesting success (Reynolds et al. 2001).
  - Tertiary Criterion—Native Floristic Composition. This criterion is divided into three levels that characterize the percentage of native species in the vegetation community: 25–65, 66–100, and 0–24 percent). Vegetation is characterized by mean frequency (percentage occurrence) of South Dakota Upland Plant Associations (Belt Transect Categories; see appendix F) as described in Grant et al. 2004a.

The result of objectively applying these three criteria using a decision tree (figure 16) is the assignment of a priority level for each tract of planted vegetation in the three districts (table 10). In all, there are 40 priority levels from Priority 1A to Priority 4J. This provides each district with a range of flexibility in applying the standardized decision tree. Each district is permitted to individually identify high-priority, moderate-priority, and low-priority levels as outlined in the Planted Grasslands Management Objectives below.

### Rationale

In attempt to restore the prairie lost to conversion to agriculture, Service personnel have planted various types of vegetation to restore the functions of a grassland ecosystem on Service lands. This discussion examines previous grassland restoration activities and considers future efforts.

The prairie was once the most common ecosystem in North America, but the modern loss of prairie habitats exceeds that of most other major ecosystems in

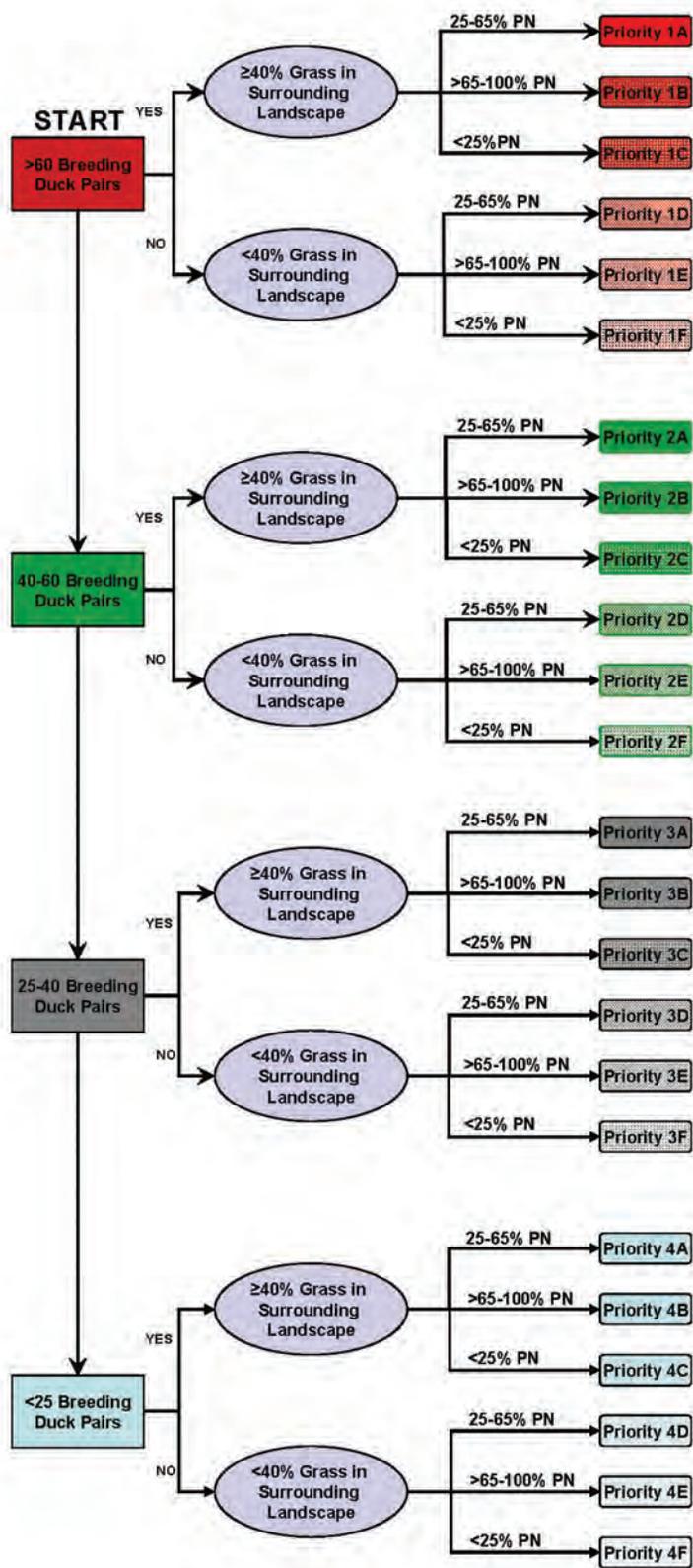


Figure 16. Decision tree for prioritizing management of planted grasslands.

**Table 10. Assigned priority levels according to the decision tree for prioritizing management of planted native vegetation.**

<i>County</i>	<i>WPA</i>	<i>Management unit</i>	<i>Priority code</i>	<i>County</i>	<i>WPA</i>	<i>Management unit</i>	<i>Priority code</i>
<b>Huron WMD</b>				Deuel	Stoltenburg		2C
Beadle	Schull		1A	Deuel	Johnson I (W)		3F
Beadle	Weaver		1C	Hamlin	Juntunen		2E
Beadle	Wipf		2A	Hamlin	LaClair		1E
Beadle	Kahre		1B	Kingsbury	Albrecht		2E
Beadle	Rogers		1C	Kingsbury	Duffy		2E
Beadle	Thesenvitz		1B	Kingsbury	Easland		2D
Beadle	South Weaver		1B	Kingsbury	Hoyer		2B
Beadle	Yauney		1B	Kingsbury	Kattke		2F
Beadle	Weiting		1B	Kingsbury	Kopperud		2C
Beadle	Kleinsasser		1A	Kingsbury	Plum Lake		2A
Beadle	Cain Creek		1B	Kingsbury	R.S. Anderson		1C
Beadle	LeClaire	Unit 4&5	1B	Kingsbury	Warne		3E
Beadle	LeClaire	Unit 6A	1B	Kingsbury	Williams		2E
Beadle	LeClaire	Unit 6&3	1C	Kingsbury	Silver Lake		1A
Beadle	Clouser	Unit 1B	1B	Kingsbury	Johnson		2B
Beadle	Clouser	Unit 2	1B	Kingsbury	Sterr		2B
Beadle	Ingle	Unit 3	1B	Lake	Hart		3D
Beadle	Ingle	Unit 1&2	1B	Lake	Gerry		3D
Beadle	Maga-Ta-Hohpi	Unit 5	1A	Lake	Lentsch		2F
Beadle	Maga-Ta-Hohpi	Unit 12,13&8	1B	Lake	Krug		2E
Beadle	Maga-Ta-Hohpi	Unit 7	N/A*	Lake	Habeger		2E
Beadle	Maga-Ta-Hohpi	Unit 3&4	1B	Lake	Hansen		3D
Beadle	Bauer	Unit 4C	1B	Lake	Alquire		2C
Beadle	Bauer	Unit 2	1B	Lake	Fischer		2E
Beadle	Bauer	Unit 4A	1B	Lake	Kattke	West	2D
Beadle	Bauer	Unit 3	1B	Lake	Kattke	East	3D
Buffalo	Mills	Unit 5	1B	Lake	Lake Henry	North	3E
Buffalo	Mills	Unit 4	N/A*	Lake	Lake Henry	South	3D
Hand	Sluneka	Unit 2A&2C	1B	McCook	Garrett		2F
Hand	Sluneka	Unit 1	1B	McCook	Gottlob		1B
Jerauld	Freudenburg		1B	McCook	Schimmel		1A
Jerauld	Winter		1B	McCook	Lions Lake		1C
<b>Madison WMD</b>				McCook	Sabers		1D
Brookings	Brush Lake		2A	McCook	Holm		2F
Brookings	Gerdink		2A	McCook	DeNeui		3D
Brookings	Eriksrud		3B	Miner	Corbin		1C
Brookings	Bjornlie		2B	Miner	Eyekamp		3E
Brookings	Kenneth Nelson		2A	Minnehaha	Johnson		3A
Deuel	Schafer		1C	Minnehaha	Fensterman		3A
Deuel	Bunde		2C	Minnehaha	Wise/Becker		3A
Deuel	Coteau Prairie		1C	Minnehaha	Island Lake		3C
Deuel	Fox Lake		2E	Minnehaha	Jordan		1F

**Table 10. Assigned priority levels according to the decision tree for prioritizing management of planted native vegetation.**

<i>County</i>	<i>WPA</i>	<i>Management unit</i>	<i>Priority code</i>	<i>County</i>	<i>WPA</i>	<i>Management unit</i>	<i>Priority code</i>
Minnehaha	Buffalo Lake	West	N/A*	Brown	Hayes		1A
Minnehaha	Buffalo Lake	East	3D	Brown	Hecla		1B
Minnehaha	Kindt/Munce	North	3A	Brown	Ryman		2B
Minnehaha	Kindt/Munce	Middle	3B	Spink	Einspahr		1A
Minnehaha	Kindt/Munce	South	N/A*	Spink	Stroschein		2E
Moody	Reaves		2F	Spink	Jessen		1A
Moody	Dobbs		3E	McPherson	Helfenstein-Opp		1C
Moody	Long		2B	McPherson	Kary		1C
Moody	Benson		2E	McPherson	Haerter		1A
Moody	Bothwell	East	2E	McPherson	Bauer-Fischer		1A
Moody	Lee	Northwest	3E	McPherson	Schell		1C
Moody	Lee	Southeast	2E	McPherson	Stuglemayer		1C
Moody	Bothwell	West	3E	McPherson	Rath		1C
Moody	Anderson	North	3E	McPherson	Heyd Lake		1C
Moody	Anderson	South	N/A*	Edmunds	Bieber-Buechler		1C
<b>Sand Lake WMD</b>							
Edmunds	Tang		1A	Edmunds	Feiock		1C
				Edmunds	Grismer		1C

\*Species composition data not available

North America (Noss et al. 1995; Samson and Knopf 1994). Consequently, grassland birds have experienced steeper, more consistent, and more widespread population declines than any other group of North American birds (Herkert 1995; Igl and Johnson 1997; Peterjohn and Sauer 1999). Breeding Bird Survey data from 1966–1996 indicates that populations of 13 species of North American grassland birds declined significantly, while populations of only 2 species increased (Peterjohn and Sauer 1999). Declines are attributed to severe habitat loss (e.g., Herkert 1994) and degradation of remaining prairie remnants (Herkert et al. 2003).

The conversion of native prairie to cropland has directly affected wetland and grassland birds by reducing and fragmenting available breeding habitat (Batt et al. 1989; Sugden and Beyersbergen 1984). In addition, encroachment of woody vegetation has fragmented grasslands and created suitable habitat for predators and forest-edge bird species. As a result, birds considered grassland obligates have been displaced and are less productive (Johnson 2006b; Naugle and Quamen 2007). Moreover, many avian species occurring in the Great Plains are grassland and wetland obligates (Igl and Johnson 1995), whereas birds associated with woody vegetation are habitat generalists with wider distributions across the continent (Johnson et al. 1994; Kelsey et al. 2006).

Current grazing regimes often do not emulate the historical processes under which grasslands evolved, resulting in altered grassland communities. In addition, some areas of native sod have remained idle for extended periods—a condition that is advantageous to invasive plant species such as smooth brome and Kentucky bluegrass. These invasive species tend to dominate and displace native species and degrade the habitat. Wilson and Belcher (1989) found that Eurasian plant species in the North American prairie not only replace the native plant community, but also affect wildlife species richness.

### Planted Grasslands Management

Native prairies typically exhibit a diversity of plant forms that includes short, rhizomatous grasses; taller bunchgrasses; a low shrub component; and a variety of forbs, depending on management and location. In comparison, structural diversity in tamegrass fields—which are dominated by introduced vegetation such as smooth brome and Kentucky bluegrass, and invasive species such as Canada thistle, wormwood, and leafy spurge—is usually lower, exhibiting a more homogeneous height across a field (Wilson and Belcher 1989). Grassland-dependent birds have adapted to the diverse structure of native prairie, whereas DNC-type mixtures limit this structural diversity and likely attract only bird species that key in on this tall, dense cover.

Restoration efforts will focus on converting tamegrass grasslands to planted native grasslands. These areas will be restored using a diversity of native vegetation that, with active management, will be relatively resistant to infestation by invasive plant species and noxious weeds (Davis and Pelsor 2001; Dukes 2001; Tilman et al. 1996). This approach will benefit grassland and wetland birds by providing vegetative structure that resembles historical conditions, thereby expanding and improving habitat for grassland-obligate wildlife species. Howell (1988) suggested that attempting to recreate the elements found in native communities may promote desirable species interactions and allow for natural selection. For example, Baird's sparrow and Sprague's pipit appear to use short, sparse grass structure and mostly associate with native bunchgrasses, rather than the broad-leaved introduced species used for DNC mixes (Madden et al. 2000). Moreover, according to Stewart (1975) and Kantrud and Higgins (1992), marbled godwit and willet typically select native grass cover over tamegrass cover.

Planted native grasslands are meant to mimic the diversity of native prairie areas. Tilman (1997) stated that biological diversity is dependent on the functionality and sustainability of the ecosystem, supporting the premise that grassland restoration actions should use diverse seed mixtures. Inclusion of forbs in native mixtures appears to be necessary in attempts to restore system functions such as nutrient cycling and energy flow (Pokorny et al. 2005). Sheley and Half (2006) indicated that seeding a wide range of forbs increases the likelihood that more niches will be filled and facilitates overall survival of the forbs. The use of multiple forbs may also be important because forb germination can vary by species in response to the yearly variation in weather conditions (Sheley and Half 2006). More specifically, varying numbers and combinations of species in differing developmental phases may be a requirement for a native seeded area to achieve the best possible results. As a stand matures, a diverse mixture may play an important role in the belowground community by providing a well-developed root system for sustainability over time (Guo and Shaffer 2006). It is suggested that planting a species-rich seed mixture will lead to the establishment of highly diversified native vegetation that is more resilient to infestation by invasive plants in restored grasslands (Biondini 2007; Blumenthal et al. 2003; Carpinelli 2001; Pokorny 2002; Pokorny et al. 2005; Sheley and Half 2006; Tilman 1997). Diverse plant communities may use resources more completely, leaving fewer resources available for potential invaders (Case 1990; Jacobs and Sheley 1999). The dominant theory in the literature indicates that planting a diverse seed mixture increases the inclusion of various functional groups among plant species and increases the ability of the grassland to maintain

integrity. Moreover, in theory, native seed mixtures should persist into perpetuity under appropriate management, which entails disturbances that mimic the natural regimes that sustained wildlife populations before human interventions. Habitat management on district lands typically involves various strategies—especially prescribed fire and rotational grazing—to emulate the defoliation agents with which prairie plants evolved. The prescription of management treatments depends on the particular vegetative components that determine the quality of the habitat (species and structure).

With extremely limited data on the reestablishment of native flora mixtures, there is a need to begin long-term research in this area. Ensuring science-based management for reseeding these areas is paramount to the perpetuation of the grassland resources.

The districts' focus on using native plants to restore WPAs is in line with the Improvement Act, which includes an "Integrity Policy" that states that System units are to promote biological integrity, diversity, and environmental health and attempt the restoration of historical conditions on System lands (Schroeder et al. 2004).

#### ***Planted Grasslands Management Objective 1***

On high-priority planted native units, apply appropriate management practices to maintain vegetation at the specified standards within 15 years of CCP approval.

#### ***Strategies***

- At 5-year intervals, increase or maintain native plants as the dominant vegetation cover, monitored using qualitative estimation in the Sand Lake WMD and quantitative estimation in the Huron and Madison WMDs.
- At 5-year intervals, maintain or decrease smooth brome and Kentucky bluegrass levels.
- No planted shelterbelts or volunteer nonnative trees (such as Russian olive or Siberian elm) exist on the landscape.
- Increase the diversity of native species by interseeding a mixture of native forbs. The mixture of native forbs should include species that are competitive across the topographic gradient and varying soils of the unit, as well as including species of the successional gradient (that is, pioneer to conservative species. Pioneer species are the early successional, frequently weedy, species that quickly colonize open spaces. Conservative species are the climax species that establish permanently and maintain site stability). The diversification process may also include the integration (through interseeding) of more native grass species over time as funding or availability allows.



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*The Savannah sparrow is a South Dakota Priority Species.*

- Develop a management plan for maintaining grasslands at the established levels.
- Careful consideration of the type of treatment used will depend on vegetation composition and succession status of the site (Gillen et al. 1987), timing of spring burning (Towne and Owensby 1984), and proper application time of chemicals (Rehm 1984).

#### *Rationale*

Certain “established” native grass plantings may lack a diversity of native forbs—perhaps as a result of cultivation, herbicide use, or lack of management (that is, disturbance). Native forbs are an important habitat component for prairie-obligate wildlife species. Dakota skippers utilize the nectar (Cochrane and Delphey 2002), while grassland birds benefit from the invertebrate community (Hickman et al. 2006) associated with the native forb component.

Seed mixes that contain a larger percent of forbs (50–60 percent by weight) tend to produce more diverse prairie communities of both grasses and forbs (Diboll 1997). Furthermore, establishing native forbs during restoration is critical for invasive species management because indigenous forbs improve community sustainability and resist invasion by exotic plants (Carpinelli 2001; Pokorny et al. 2004; Sheley and Half 2006). Ultimately, planting a mixture of forbs compared to a single forb species will help to mitigate seasonal, annual, or local conditions that can impair the success of forb establishment (Sheley and Half 2006).

Planted native sites need to be appropriately managed to ensure grassland health. Management treatments such as fire, grazing, and haying are critical to restoration success. The site-specific timing, frequency, and type of management treatment will be based on monitoring information.

#### **Planted Grasslands Management Objective 2**

Moderate units are managed as high-priority units as funding and staff time permits. In years with insufficient funding or staff resources, moderate units are left idle.

#### **Planted Grasslands Management Objective 3**

On low-priority units, apply disturbance every 5–8 years to remove plant litter, restore plant vigor, reverse woody plant expansion, and provide a mix of structural types that include (1) relatively short/sparse vegetation for species such as upland sandpiper, marbled godwit, northern pintail, and chestnut-collared longspur; (2) moderately short vegetation for species such as blue-winged teal, short-eared owl, northern shoveler, and grasshopper sparrow; and (3) tall/dense vegetation for species such as mallard, northern harrier, gadwall, and bobolink.

There is almost no monitoring of vegetation on these WPAs except for routine, cursory surveillance for noxious weeds. Nevertheless, knowledge of the relationship between fire frequency and the resulting post-fire vegetation structure enables land managers to predict the habitat conditions described below. Vegetation should exhibit these characteristics within 15 years of CCP approval.

#### *Strategies*

- One-fourth of the total acreage of low-priority planted native grassland is in a condition of 0–1 year post-disturbance, one-fourth is in a condition of 2–3 years post-disturbance, and one-half is in a condition of 4–6+ years post-disturbance. These characteristics correspond roughly to VOR categories of 6 inches or less, 6–14 inches, and more than 14 inches, respectively (Robel et al. 1970). Such a distribution, or mosaic, of structural conditions is desirable to meet the needs of a wide array of grassland-nesting birds.
- Target volunteer and nonnative trees (such as Russian olive or Siberian elm) for removal (this does not require removal of shelterbelts as in high-priority units).

#### *Rationale*

Under the native floristic composition criterion for prioritizing, planted vegetation with native floristic composition of 0–24 percent is considered highly degraded and is the lowest priority. In the northern Great Plains, fire and other control methods, such as herbicide applications, depend heavily for their success on the presence of a minimum of 20 percent of native species in the matrix (Dill et al. 1986; Willson and Stubbendieck 2000). A grass matrix dominated by a few introduced species inhibits the germination, establishment, and persistence of most native species. Willson and Stubbendieck (2000) suggested that, at sites dominated by smooth brome and supporting less than 20 percent native species, alternative methods for prairie restoration should be tried. Because restoration of highly degraded prairies is not likely to be successful using traditional methods such as grazing and prescribed fire, these tracts are of low

management priority. Further, these tracts are likely to be approached as tamegrass tracts, where the most appropriate action is to completely restore the area to planted vegetation through preparation of the seedbed and reseeding.

### **Tamegrass Grassland**

“Tamegrass grassland” is a term used to identify uplands with a farming history that are dominated by cool-season exotic species such as smooth brome and Kentucky bluegrass. Some tamegrass grasslands were acquired during the establishment of wetland management districts when grasslands enrolled in the CRP were purchased for the benefit of wildlife as part of a WPA. CRP grasslands were typically tame grasses (such as smooth brome) designed to stabilize highly erodible land. Additionally, during the procurement of property for WPAs, cropland was purchased and reseeded to DNC. Although DNC is beneficial on multiple levels, this mixture requires intensive inputs to maintain over the long term. Oftentimes, fields are not reseeded at the prescribed frequencies; this allows cool-season invasive species to outcompete, and results in tamegrass grasslands.

#### ***Tamegrass Objective 1***

Over a 15-year period, annually seed a minimum of 200 acres of old cropland in high-priority WPAs to a native grass mix to develop grassland communities of varied structure as appropriate to the site. By 5 years post-establishment, these areas should be characterized by native plants as the dominant vegetation cover, as determined by qualitative estimation in the Sand Lake WMD and quantitative estimation in the Huron and Madison WMDs.

- **Special Note:** For this objective, planning team members used their knowledge and expertise to develop an acreage objective. This objective was deemed to be achievable under the funding and staff levels specified in the draft CCP.

#### ***Strategies***

- Use appropriate site preparation techniques to ensure a weed-free seedbed. These may include a combination of cropping and chemical treatment using a glyphosate-based herbicide.
- Develop a seed mixture with equal parts by weight of grass and forbs. The grass component should contain both cool- and warm-season species. The forb component should contain both early and late-flowering species. Both grass and forb species should be selected to span the gradients associated with site topography, successional stages (that is, early pioneer to conservative plants), and soil types.
- Use a variety of tools in post-seeding management, including clipping, prescribed fire, prescribed grazing, and appropriate IPM strategies.

- Monitor results of vegetation establishment.
- To ensure that grassland restoration efforts are science-based, conduct research on selected newly seeded sites to determine the establishment success of species included in the mixtures. From this dataset, within 15 years of CCP approval, develop a decision matrix to help with selecting optimal species to use in grassland restoration projects.
- To ensure effectiveness of native seed mixes containing grasses and forbs, conduct research on wildlife response that focuses on Lepidoptera and grassland-dependent migratory birds (waterfowl, shorebirds, and songbirds) within 10 years of CCP approval.

#### ***Rationale***

The establishment of native-dominated perennial herbaceous cover, in concert with prescribed application of periodic fire and grazing, resists the encroachment and establishment of invasive species. Sources in the literature suggest that species-rich seed mixtures may reduce weed invasion on native seeded grasslands (Blumenthal et al. 2003; Carpinelli 2001; Pokorny 2002; Sheley and Half 2006; Tilman et al. 1996). In a study by Pokorny et al. (2005), the investigators determined that indigenous forbs resisted invasion by spotted knapweed better than grasses did. The overall theory in the literature indicates that seeding a species-rich seed mixture increases the inclusion of various functional groups among plant species. The more species included in a mixture, the higher the probability of providing competition to resist invasion by nonnative plants.

Moreover, native vegetation is preferred over nonnative vegetation by a number of grassland birds (Bakker and Higgins 2009). Mark Sherfy of USGS found that ducks nesting in CRP fields in North Dakota and South Dakota showed no significant preference for tamegrass-seeded (that is, DNC) fields over native seeded fields. In addition, nest success was slightly higher in native seedings than in tamegrass seedings. According to Klett et al. (1984), nest initiation rates for mallard, gadwall, and blue-winged teal in the Dakotas were as high or higher in native-seeded fields than in seeded fields that lacked natives. Similarly, nest success was not significantly different in native-seeded than in tamegrass-seeded study fields (Klett et al. 1984).

Ultimately, restoration success (habitat improvement) is dependent on monitoring and management efforts. Monitoring determines the nature and the appropriate timing of the management action. Effective management (prescribed fire, grazing, mowing, or chemical treatment) of restoration sites is critical for establishment, productivity, and longevity of the grassland stands.

The districts' focus on using native plants to restore WPAs is consistent with the Improvement Act, which

includes an “Integrity Policy” that states that Refuge System units are to promote biological integrity, diversity, and environmental health and attempt the restoration of historical conditions on Refuge System lands (Schroeder et al. 2004).

### **Tamegrass Objective 2**

Over a 15-year period, continue to maintain perennial grass cover (DNC, tamegrass) on tracts that have not yet been seeded to native grass or begun the seedbank preparation process (for example, multiple years of row cropping) for eventual reseeded.

#### **Strategy**

- Use various combinations of management actions (chemical application, mowing, haying, grazing, and burning) to maintain grassland vigor and treat infestations.

#### **Rationale**

Tamegrass fields that have not yet entered into the seedbed preparation process generally consist of a predominance of introduced cool-season grass species. Prior to initiating seedbed preparation management for eventual seeding to native grass, these sites are of relatively low priority. Management efforts can be better directed toward higher priority upland areas (specifically native prairie, tracts already reseeded to native grass, and tracts being actively prepared for native reseeded). Despite their substantial degree of degradation in the context of floristic diversity, perennial grass cover will likely support multiple plant species and generalist birds, including upland nesting ducks, northern harriers, and sedge wrens, and is also important for maintaining soil organic matter (McLauchlan et al. 2006), a condition that is critical for future restoration potential.

### **Dense Nesting Cover**

Certain upland areas were seeded back to an herbaceous cover of introduced vegetation known as DNC (dense nesting cover). Traditionally, these seed mixtures comprised cool-season introduced grasses and legumes (intermediate wheatgrass, tall wheatgrass, alfalfa, and sweetclover) that establish well under a wide variety of soil, moisture, and climatic conditions that exist across the Prairie Pothole Region. Such a mixture provides nesting cover for generalist birds including upland-nesting ducks (Duebber et al. 1981), northern harrier, and sedge wren (Johnson et al. 2004). DNC provides attractive nesting cover for 6–8 years after seeding and up to 15 years with proper management (Duebber and Frank 1984; Higgins and Barker 1982; Lokemoen 1984).

Ideally, the majority of these tracts planted to DNC will be seeded back to a native mixture; however, certain situations may limit the opportunity to do so. If a DNC mixture is used, intermediate wheatgrass

and tall wheatgrass are viable grasses to select, and alfalfa is an appropriate legume. Under no circumstances should smooth brome or sweetclover be used in DNC mixtures. DNC tracts must also be managed to maintain optimal vigor throughout the life cycle of the planting. Especially in cropland-dominated areas, invasive plant threats will persist and will require appropriate treatments to control. Management methods such as grazing and fire may be used to stimulate the height and density of DNC mixtures. Mechanical methods such as haying may also benefit plantings by removing the litter layer. Finally, the most productive stands of DNC are those that are reseeded approximately every 10–15 years, including appropriate crop rotation frequency as seedbed preparation (Duebber et al. 1981). Before a tract is planted back to DNC, the Service’s Integrity Policy and the sustainability of native grasslands should be considered.

### **Dense Nesting Cover Objective**

During the life of the CCP, manage habitat blocks of DNC to sustain a composition of approximately 25 percent legumes.

#### **Strategies**

- Use appropriate site preparation techniques to ensure weed-free seedbeds.
- Use farming activities to provide an appropriate seedbed for seeding.
- Manage this habitat using varying tools such as fire, haying, grazing, and idling. Reseed introduced DNC species mixes every 10–15 years.

#### **Rationale**

Tamegrass grassland tracts that have not begun the seedbed preparation process will be maintained in an idle state that generally consists of a predominance of introduced cool-season grass species. Before seedbed preparation for seeding to native grass, these sites are of relatively low priority. Management efforts can be better directed toward higher priority upland areas such as native prairie, tracts already reseeded to native grass, and tracts being prepared for native reseeded. According to Mark Sherfy of USGS, there is evidence that, despite the presence of introduced cool-season perennial grass cover, DNC likely supports multiple plant species and generalist birds, including upland-nesting ducks.

### **Noxious Weeds**

Significant infestations on Service lands have resulted in a loss of habitat for wildlife and a decline of species diversity in prairie grasslands. Control of noxious weeds is costly in time and money. Control requires careful planning, implementation, and monitoring as defined by an integrated approach to management of noxious weeds designed to meet a habitat objective.

**Noxious Weeds Objective 1**

After CCP approval, maintain the current IPM plan, following stated guidelines for the use of chemical, mechanical, and biological control of priority invasive plants.

**Strategies**

- Review and update the IPM plan every 5 years.
- Prepare annual progress reports in the Pesticide Use Proposal Database.
- Hold annual meetings to share current treatment techniques and results, including information on successful and unsuccessful treatment protocols, future plans, and new problematic species.

**Rationale**

Each district has developed an IPM plan specific to its needs. These plans detail strategies for (1) inventory and mapping of invasive plants, including noxious weeds; (2) prevention and control of new infestations; and (3) control of current known infestations. An integrated approach to pest management will be used to treat infestations of invasive plants on Service lands. The IPM plans identify the statewide distribution of species of concern and suitable control methods. A surveillance program will be designed and carried out to document the current infestations and document the introduction and spread of new invasive plants. The implementation of an early detection and rapid response system requires annual coordination with the South Dakota Department of Agriculture; county weed boards; and other Federal, State, and local partners. All parties will share information and discuss the most effective, economical, and environmentally appropriate control strategies for priority invasive plant species.

**Noxious Weeds Objective 2**

The Huron and Madison WMDs will maintain an inventory of all noxious weeds on Service lands.

**Strategies**

- Utilize RLGIS (Refuge Land Geographic Information System) to ensure standardized mapping format.
- Repeat inventories at a minimum of 2-year intervals.
- The Sand Lake WMD has initiated an RLGIS inventory of noxious weeds on Service lands.

**Rationale**

Noxious weeds are a major threat to native ecosystems in the United States. Invasions of natural ecosystems by nonnative species now rank second to habitat loss as the major threat to biodiversity (ISSG 2001; Wilcove et al. 1998:607; Wilson 1992:253). Infestations of noxious weeds have a direct effect on the ability of the districts to fulfill their wildlife conservation mission—particularly species recovery and the maintenance

and restoration of biological diversity, integrity, and ecological health. The utilization of RLGIS to inventory and maintain noxious weed information will provide managers with a starting point in ranking areas to be treated.

Trying to manage an infestation of noxious weeds without any idea of the size, canopy cover, or rate of spread jeopardizes the efficacy of the control efforts and wastes precious time and money. An inventory will help establish priorities for the strategies used both to eliminate new and isolated infestations and to contain or reduce larger infestations by attacking the perimeter and working toward the center. Inventory maps are an invaluable planning tool for management and play a critical role in monitoring the effectiveness of control methods—for example, by ensuring that a treated area is not reinfested after several years by viable dormant seed.

The Service, the State of South Dakota, and other partners have not yet developed and universally adopted criteria for mapping noxious weeds. Regional invasive species experts and IPM coordinators in Region 6 are in the process of drafting protocols for field mapping noxious weeds for entry and storage in the RLGIS. These protocols will provide guidelines for (1) mapping new and old infestations, (2) minimum mapping units, and (3) the use of point data versus polygons and canopy cover. The guidelines will incorporate the minimum standards outlined in “The North American Invasive Plant Mapping Standards” (North American Weed Management Association 2002). Once a baseline inventory has been completed for Service lands in South Dakota, the focus will shift to more scientific surveys to provide quantifiable data.

**Noxious Weeds Objective 3**

Carry out measures to reduce and control 20% of targeted noxious weeds on priority WPAs by 15 years after CCP approval.

**Strategies**

- Conduct a surveillance program for new infestations of noxious weeds.
- Apply early detection, rapid response strategies to attack new infestations before they become large and costly to treat.
- Respond promptly to all landowner or other public complaints.
- Monitor infestation rates and effectiveness of control efforts.
- Map sites of invasive plant treatments in the RLGIS.
- Use GIS to predict areas at greatest risk of new infestations.
- Monitor change over time by collecting RLGIS cover-type data for all invasive plant species. Share GIS layers of invasive plant infestations with partners.

- Obtain help with noxious weeds (treatments and monitoring) by pursuing additional money through partnerships, grants, and invasive plant programs.
- Communicate with and educate local, State, and Federal agencies and the public about invasive plant issues.
- In a timely manner, make known information about new infestations, effective or ineffective treatment methods, and new treatment options.
- Coordinate invasive plant control by meeting at least once per year with county weed boards, representatives from weed management areas, and other partners to share information and discuss control strategies.
- Address public complaints about noxious weeds on Service-owned lands, using IPM strategies.
- Use only certified weed-free seed to restore habitat.
- Avoid purchasing seed from sources known to have violated the weed-free seed regulation.
- Focus restoration activities on high-diversity mixes of native grasses and forbs in order to develop habitat that will be more resistant to invasion by noxious weeds.

#### *Rationale*

In 2008, an estimated 2 million acres of Canada thistle (1,600,989 acres) and leafy spurge (307,558 acres) infested South Dakota's pastures, cropland, and wildlife areas (Moechnig et al. 2009). Using IPM methods to control State-listed noxious weeds is a Service priority. These problem plants can displace native vegetation over large areas and have the ability to form nearly monotypic stands in the absence of management; therefore, these plants threaten native biodiversity (Bedunah 1992; Hutchison 1992; Svedarsky and Van Amburg 1996; Trammell and Butler 1995; Watson 1985). Due to the extent of infestation, these species have been the priority noxious weeds on Service lands in South Dakota.

The first step in control programs is to prevent the introduction, reproduction, and spread of noxious weeds. Many of the newer invasive plants and "watch" species were introduced by seed imported from States and countries that have noxious weeds. Wherever possible, all grass seed should be bought from seed grown in South Dakota to minimize the introduction or spread of new invasive plant species.

The conversion of tamegrass areas to plantings of native grasses and forbs is a form of grassland restoration utilized to improve habitat. This restoration process targets invasive cool-season grasses (smooth brome and Kentucky bluegrass); however, the same process also addresses noxious weeds. The grassland restoration process often incorporates a cropland phase, which may include the use of genetically modified (Roundup® ready) varieties of corn or soybeans



Mason Sieges/USFWS

*Control of Canada thistle is one objective of upland management on the districts.*

that are treated with glyphosate, a nonselective herbicide. The utilization of genetically modified organisms (specifically crops) has been approved for each station by the assistant regional director, National Wildlife Refuge System based on the authority and process identified in "Guidance and Approval for the Use of Genetically Modified Crops on the Nation Wildlife Refuge System," memo and attached exhibits, issued January of 2008.

Maintaining these fields in crop production for several years helps prepare the seedbed for planting and restoration by significantly depleting the percentage of viable invasive plant seed in the upper soil layer, thereby reducing germination potential. The cropland phase of the restoration process is more critical when areas are heavily infested with Canada thistle or other noxious weeds. Such fields will be replanted to a grass and forb mixture designed to meet habitat objectives for individual tracts.

Mowing or haying may be used to remove the aboveground growth of noxious weeds before flowering and seed production in areas where other treatments may not be available or practical. Heavily infested areas can often be hayed early to prepare the site for other control practices (for example, biological control agents and chemical control). Two common obstacles to haying for control of noxious weeds are (1) excessively rough and uneven ground, usually due to pocket gopher activity; and (2) potential to spread the noxious weeds in hay transported off Service lands to private lands. Grazing by sheep or goats can be used to maintain an invasive plant population at a level that the plant no longer presents an economic hardship. Prescribed fire and grazing may also be used as a pretreatment to prepare for herbicide application.

Biological control may be the most cost-effective and long-term solution to controlling large areas of leafy spurge. Flea beetles have been used successfully to reduce root density, stem density, biomass, and number of roots buds (Kirby et al. 2000). Significant results are usually detectable in root biomass within

2–3 years and aboveground after 5 years post-release (Kirby et al. 2000). Researchers from North Dakota, South Dakota, Montana, and Wyoming have documented that approximately 85 percent of all release sites are established by releasing 1,000–6,000 flea beetles (Anderson et al. 2003). They also detected an average rate of control of approximately 1.6 acres per release site per year. These flea beetles tend to grow and decline exponentially depending on the amount of forage that is available for them to consume. The use of other biological controls for other invasive plant species needs to be investigated. Releases of Canada thistle stem mining weevil, seed head weevil, and stem gall fly have shown mixed results for control of Canada thistle. Biocontrol is commercially available for musk thistle, yellow and Dalmatian toadflax, yellow star-thistle, knapweeds, and purple loosestrife.

## WETLANDS GOAL

*Protect, restore, and enhance prairie pothole wetlands to support diverse plant communities and provide habitat to waterfowl, shorebirds, wading birds, and associated wetland-dependent wildlife.*

### Natural Wetlands on WPAs

Service-owned wetlands in the three districts consist of a wide variety of wetland sizes and regimes (temporary, seasonal, semipermanent, and permanent) (Stewart and Kantrud 1971). Wetland clusters of these diverse types constitute wetland complexes (Weller 1988).

The majority of wetlands on Service lands are natural wetlands (that is, they are not influenced by water level management features or activities). Natural wetlands are dynamic systems: some—temporary and seasonal wetlands—are influenced only by spring runoff and rainfall. Others—semipermanent and permanent wetlands—are also influenced by ground water interaction. However, in all these types, natural processes guide temporal fluctuations in water levels, abiotic conditions such as salinity, and biotic conditions such as plant and invertebrate communities. All these conditions drive the nutrient and vegetation cycles that shape the dynamic character of these wetlands.

The drought and deluge frequencies associated with a given climate determine the speed of the nutrient and vegetation cycles (Murkin et al. 2000; Weller and Spatcher 1965). Prolonged high water produces a “lake” wetland with little emergent cover and few nutrients in detritus, whereas persistent low water produces heavy emergent cover and high nutrient sequestering in plant material. The occurrence of these extremes during weather cycles causes plant population turnover (maintaining biological diversity) and nutrient mobilization. Euliss et al. (2004) stressed the need to consider the changes these prairie wetland systems undergo as a result of normal climatic variation when



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*An American bittern enjoying the bounty of its wetland habitat.*

evaluating biological wetland data or wetland conditions (for example, dry, devoid of emergent vegetation, or choked with emergent vegetation).

Wetland ecologists have recognized the contribution of the Prairie Pothole Region wetland complexes to ecosystem goods and services at the landscape scale (Brown and Dinsmore 1986; Fairbairn and Dinsmore 2001; Swanson et al. 2003). Five key wetland functions provide important services: flood abatement, water quality improvement, biodiversity enhancement, carbon management, and aquifer recharge (Gleason et al. 2008). However, provision of wildlife habitat and the sustainability of waterfowl and other water-dependent populations have traditionally received the most attention.

Although the Prairie Pothole Region occupies only 10 percent of North America’s waterfowl breeding range, it produces approximately 50 percent of the continental waterfowl population (Kantrud 1983). While semipermanent and permanent wetlands provide brood-rearing and migratory stopover habitat, temporary and seasonal wetlands draw breeding duck pairs to South Dakota and other parts of the Prairie Pothole Region. Complexes of depressional, palustrine wetlands scattered throughout eastern South Dakota attract breeding duck pairs, support nesting and re-nesting intensity, and provide brood habitat (Kantrud et al. 1989). According to Ron Reynolds of the Service’s HAPET (Habitat and Population Evaluation Team), it is estimated that every ten 1-acre wetlands can predictably support 20 duck pairs; in contrast, one 10-acre wetland likely supports only seven duck pairs; hence, the availability of wetlands is a major factor driving duck breeding in the Prairie Pothole Region. Meeting the objectives for natural wetlands requires habitat management activities such as restoration and protection against wetland degradation (such as sedimentation, invasive plant infestation, drainage, filling, and contamination).



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*The Canadian toad is a denizen of the Prairie Pothole Region.*

### **Natural Wetlands Management Objective**

Over a 15-year period, wetlands will be managed along with the uplands in which they are embedded according to the priority systems developed for upland vegetation. A minimum of 10 degraded (drained, filled, leveled, invasive-choked, and contaminated) wetlands will be restored for improved wetland function in each district.

### **Strategies**

- Initiate restoration actions on wetlands as the need for restoration is identified (for example, discovery of an old drainage ditch would trigger restoration actions).
- On selected wetlands, control the invasion of hybrid cattail and reed canarygrass.

### **Rationale**

Wetland managers have been restoring prairie wetlands since the 1960s (Dornfeld 1988). Most wetland restorations are accomplished by plugging ditches with simple clay-core dams and seeding the surrounding upland to perennial grassland cover (Knutsen and Euliss 2001). Fill and sediment may be removed to restore hydrologic function.

It has generally been concluded that, whenever possible, restoration efforts in the Prairie Pothole Region should focus on restoring wetland complexes rather than individual basins. Wetlands in a single complex, even if widely separated, are often hydrologically connected by surface or ground water (Murkin et al. 2000; Winter and Rosenberry 1995). The biodiversity and productivity of wetland complexes are affected by exogenous forces, such as climate, and endogenous forces, such as the mix of permanence types, surficial geology, water regimes, wetland juxtaposition, and vegetation (Swanson et al. 2003; van der Valk 2005; Weller 1994, 1999; Weller and Fredrickson 1974).

Organisms move among components of the wetland complex seeking food, water, and cover (Naugle et al. 2001). Because of the variability of water conditions over seasons and years, wetland complexes are more likely to have at least some wetlands in a water and plant regime favorable to a given species, thus ensuring diverse species representation in wetland landscapes (Weller 1999). Waterbirds often build their local habitat units around a wetland complex that provides various needs and that may also act as a backup in the event of catastrophic change (Weller 1999). Knutsen and Euliss (2001) suggested that targeting large blocks of wetlands for restoration would increase the chances for the successful return of all wetland characteristics, including wildlife.

### **Wetlands with Water Control Structures on WPAs**

Wetlands with water control structures or other capability for managers to manipulate water levels are generally managed impoundments. Their relatively shallow depths and periodic flooding and drying regimes support highly productive systems with respect to invertebrates and wetland vegetation. Corresponding bird use is generally quite diverse.

Meeting objectives for developed wetlands would require that water level management actions are carried out in a timely and appropriate manner. Ideally, impoundments should provide a mosaic of wetland habitat types to a wide variety of wetland-dependent birds such as waterfowl, shorebirds, and wading birds.

### **Wetlands with Water Control Structures Objective**

Throughout the life of the CCP, manage the developed wetlands as dynamic wetland systems that cycle between drawdown and flood events to provide quality habitat for waterfowl, shorebirds, and wading birds. During periods between drawdowns, manage developed wetlands to provide 30–70 percent emergent vegetation and annual species.

### **Strategies**

- In high-priority wetlands, implement periodic disturbance using water control structures to provide the full spectrum of wetland conditions—dry marsh, densely vegetated marsh (regenerative phase), hemi-marsh, open marsh (degenerative phase), and open water—to benefit wetland-dependent species of wildlife.
- Review all water management structures for improvements or repairs that would enhance management capability and seek funding necessary to carry out the improvements or repairs.

### **Rationale**

Periodic drought may hasten full or partial drawdowns in some units. Although such drawdowns maximize the long-term viability of wetlands, the availability

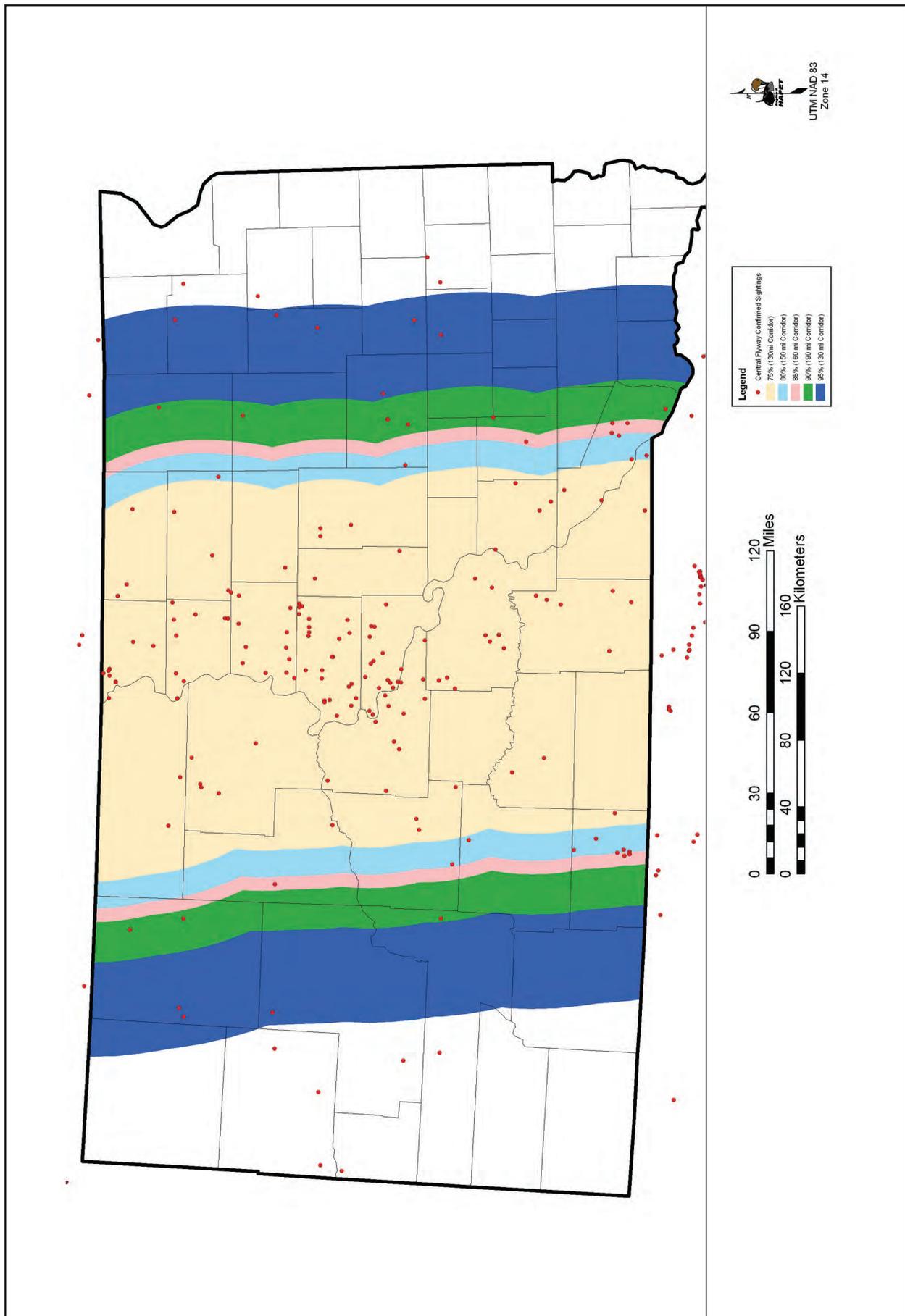


Figure 17. Whooping crane sightings throughout South Dakota.

of wetlands with water is reduced during drought. In contrast, some past management approaches emphasized retaining as much water as possible to offset landscape-level drought effects on migratory birds at the expense of long-term capacity to sustain wetland productivity. The speed of the cover cycle (return time) and the number of switches between cover-cycle stages over a period of time are strongly correlated to wetland productivity and biodiversity (Swanson et al. 2003; van der Valk and Davis 1978). Long return times or extended periods without switches produce wetlands “stuck” in either the lake stage or the dry stage with stable but relatively unproductive conditions. Weller and Fredrickson (1974) noted that stable water levels produce ornithologically “dead” marshes characterized by a centrally open marsh with a perimeter of dense emergent vegetation.

This objective purposely includes broad ranges, as water levels are intended to vary like those in natural wetlands. Previous research has indicated that wetlands with an approximate 50:50 ratio of open water to emergent vegetation (such as cattails and bulrushes) resulting from a combination of regenerating and degenerating states (that is, hemi-marshes) attract the highest densities and diversities of wetland birds (Weller and Spatcher 1965). Open water to emergent vegetation ratios should be close to the 50:50 ratio (that is, between a ratio of 30:70 and 70:30) in most developed wetlands, as recommended by Weller and Spatcher (1965), in most years (approximately 11 of 15), through targeted water level management.

Because of the temporal dynamics that influence prairie wetland conditions, in certain years the coverage of emergent vegetation may fall well outside the target range (30–70 percent coverage). During years of extreme drought, emergent vegetation may exceed the upper-end target of 70 percent; during extremely wet periods, wetlands may revert to a more open-water state, supporting far less than 30 percent coverage by emergent vegetation.

Drawdowns and, more specifically, drawdown intervals can influence plant species composition, structure, and seed production (Fredrickson 1991). Periodic, growing-season drawdowns stimulate production of seed-bearing annual plants, increase invertebrate biomass, and stimulate establishment and expansion of emergent and submergent plant species. A sharp increase in invertebrate populations when wetlands reflood following a dry phase is an important reason for artificially flooding and draining wetlands to enhance waterfowl habitat (Cook and Powers 1958; Kadlec and Smith 1992).

### Whooping Crane

Each spring and fall, endangered whooping cranes use wetlands and agricultural fields, primarily along the Missouri River, as migratory stopover areas en



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*Dragonflies in a prairie wetland.*

route to their summer and winter grounds (figure 17; Austin and Richert 2001). In the absence of any historical records of whooping cranes nesting in South Dakota (Tallman et al. 2002), the CCP planning team deemed management actions directed at the occasional sighting of migrating or dispersing individuals most appropriate.

### Whooping Crane Objective

Over a 15-year period, annually inform the public of migrant whooping cranes stopping in the districts in an effort to reduce the risk of accidental shootings or other disturbances.

### Strategies

- Post warning signs in the areas being used by whooping cranes.
- Contact the local media (radio, television, newspapers) upon confirmed observations, when it appears that whooping cranes will stay in the area for multiple days and where hunting activity exists or is likely.
- Actively patrol areas being used by whooping cranes to monitor their whereabouts and inform the public of their presence.
- On a case-by-case basis for each occurrence of a whooping crane, consider the merits of a possible voluntary hunting closure on private lands where whooping crane use is regularly occurring. If this is deemed appropriate, contact the landowner(s) to discuss a possible voluntary closure in accordance with the “Contingency Plan for the State-Federal Protection of Whooping Cranes” (USFWS 2001b).

### Rationale

Known as one of the most endangered birds in North America, whooping crane was listed as endangered in 1967 (Federal Register, March 11, 1967). The wild, migratory population of whooping cranes in the Central Flyway (Aransas–Wood Buffalo population) is expected to reach 290 individuals in fall 2010 (Tom

Stehn, USFWS, personal communication). Adults stand 4–5 feet tall with a wingspan of 7.5 feet; adult plumage is described as snow white with contrasting black wing tips and red facial skin. Because of their often close interaction with sandhill cranes and their use of similar habitats, potential exists for whooping cranes to be mistaken for sandhill cranes. With sandhill cranes being a relatively popular game species in South Dakota, the Service hopes that by informing and educating area hunters about whooping cranes' use of district lands, it can greatly reduce any risk of an accidental shooting. The Service will consult the "Contingency Plan for the State-Federal Protection of Whooping Cranes" (USFWS 2001b) for appropriate actions when dealing with migrant whooping cranes that show potential for remaining in the district for multiple days.

## RESEARCH AND MONITORING GOAL

*Provide a learning platform that uses science, monitoring, applied research, and adaptive management to advance understanding of the Prairie Pothole region and management of these areas.*

### Research and Monitoring

Most of the baseline inventories and monitoring of Service lands in the three districts is recent (2003 to present), corresponding with the appointment of wildlife biologists to the districts. While progress has been made in accruing baseline biological data, habitat goals and objectives should form the basis for future monitoring and research priorities for district lands. Goals and objectives emphasize management of vegetation communities as habitat for wildlife. Monitoring and research should be used to predict and validate wildlife response to management. It is the Service's policy to encourage and support management studies in order to provide scientific data upon which decisions may be based. The USFWS "Wildlife Refuges Manual" (1957) states, "Managers who analyze and test wildlife management concepts and report results accurately will be operating in a more challenging, effective manner." According to the Service's "Fulfilling the Promise" document (1999), "Habitat monitoring is critical. If we are to lead the world in habitat conservation, management, and monitoring, it must be by example..." Too often, biological needs of wildlife species and their habitats receive less consideration than socioeconomic and political factors in the decision-making process. Biology should guide management decisions for the Refuge System.

#### Research and Monitoring Objective 1

Within 10 years of CCP approval, Sand Lake WMD will establish a vegetation inventory (that is, a habitat cover map) of upland habitats on all fee-title properties.

### Strategy

- Use the National Vegetation Classification System mapping standards in the RLGIS.

### Rationale

Most factors that contribute to the dynamics of wildlife populations, especially those of migratory birds, may not be directly influenced at the individual district or WPA level, but can be indirectly influenced through appropriate or inappropriate management of habitat. A basic inventory of habitats is the first step in developing detailed objectives describing the desired future vegetation conditions. While maps of the upland habitats have been completed for the Huron and Madison WMDs, a map is needed to establish a baseline of current upland habitats in the Sand Lake WMD.

#### Research and Monitoring Objective 2

Within 2–5 years of completion of the habitat cover map, develop and complete a Habitat Management Plan and Inventory and Monitoring Plan for the districts.

### Strategies

- Develop specific habitat goals and objects for priority management units based on data from baseline surveys.
- Ensure that all elements of the monitoring protocol are documented:
  - question
  - sampling design
  - methodology
  - anticipated analysis and analytic tools
  - data management and reporting strategy
  - schedule
- Use supporting processes as needed (for example, conducting a station biological review, requesting a biological assessment, developing annual habitat work plans, completing a wildlife and habitat review handbook [USFWS 2008b]).
- Complete detailed and accurate plans within the allowed timeframes.

### Rationale

Because the CCP is a broad umbrella plan that provides general concepts and specific management and operational objectives for Service lands, it is imperative that step-down plans such as inventory and monitoring plans and habitat management plans are produced. The purpose of step-down plans is to provide detail and clear direction to Service managers and other employees who will carry out the strategies described in the CCP.

A habitat management plan provides staff with detailed information about various management practices. However, completion of vegetation inventories is recommended before starting this process. Upon



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*A white-tailed buck easily clears a livestock fence.*

completion of essential surveys, such as the habitat cover map, managers will be able to thoroughly assess the biological integrity, diversity, and ecological health of the upland and wetland habitats they manage. The habitat management plans would identify specific habitat objectives for each district. Each plan would also provide detailed information about various management practices (such as timing of prescribed fire; timing and intensity of grazing; timing, application rate, and pesticide type for chemical applications; and water level manipulations). An inventory and monitoring plan outlines proposed activities for habitat and wildlife data collection and provides detailed information on methodology and analysis.

### **Research and Monitoring Objective 3**

Over a 15-year period, focus priority inventory, monitoring, and research efforts on information needs outlined in the biological objectives set forth in the CCP.

#### **Strategies**

- Continually update and refine the list of priority research needs using the annual meeting of South Dakota biologists as a platform for discussion.
- Share annual progress on current monitoring and research, results to date, and future projects during the annual South Dakota biologists meeting. Include information on the success or failure of particular treatment protocols in achieving stated objectives and include plans for future treatments.
- Use initial inventories as baseline data to assess past and future changes in plant and animal community composition.
- Use periodic surveys (for example, every 5 years) to assess vegetation composition of high-priority district habitats.
- Strive to ensure that all data and information derived from inventory and monitoring are well documented, maintained, and archived and that they are open and accessible both internally and externally, unless otherwise stated. Report results in a format

and schedule that are usable, understandable, and responsive to the user.

- Whenever feasible, utilize and build on existing monitoring and data management efforts, both internal and external. When appropriate, strive to design and link local and regional monitoring efforts to support national assessments (that is, integrate the data across scales).
- Design and conduct issue-driven research unlikely to be reliably addressed using long-term monitoring. Develop predictive models for habitat management and restoration.
- Focus wildlife population research on assessments of species-habitat relationships. Develop models that predict wildlife responses to habitat management or restoration.
- Promote research and science priorities within the broader scientific community. Ensure that cooperative research addresses information needs identified in habitat management goals and objectives.
- According to WH-14 of “Fulfilling the Promise,” “Use adaptive management to evaluate effectiveness of wildlife conservation programs and periodically evaluate programs to determine if [district] goals and objectives are being achieved.” Support research that inherently integrates science with management, such as adaptive management studies.
- Encourage efficient and productive cross-station collaboration on common interests by participating in large-scale monitoring and research projects. Contributions to this effective strategy for addressing priority research needs may include providing on-the-ground study plots, equipment or staff for data collection, technical assistance, consultation, or other forms of support and collaboration.
- Host a North Dakota–South Dakota Workshop to develop an initial set of Dakota-wide research priorities for the next 10–15 years.
- Huron-specific strategy: Evaluate biological information needs identified in Huron WMD’s Biological Assessment, supplementary to those addressed in the CCP’s biological objectives, to determine which deserve consideration as secondary priority needs.

#### **Rationale**

##### **Applied Research and Adaptive Management**

Knowledge gaps regarding natural resources are many and varied. Research needs include information about treatment tools, response to various treatments, and wildlife response to management treatments and habitat changes. Investigations must be adequately designed, funded, and conducted to reliably address proposed hypotheses or questions. Partnerships would need to be developed for a variety of disciplines from various State and Federal agencies and institutions

to meet the research goal and objectives. Cooperative efforts would be supported with shared funding, lodging, vehicles, equipment, knowledge, and expertise. All research needs would need to be prioritized because resources (funding, staff, and equipment) are always limited and often insufficient. According to Platt (1964), “Biology, with its vast informational detail and complexity, is a ‘high-information’ field, where years and decades can easily be wasted on the usual type of ‘low-information’ observations or experiments if one does not think carefully in advance about what the most important and conclusive experiments would be.”

The following are examples of ongoing partnership and cooperative research across Service lands:

- In 2005, the Dakota Working Group’s Grassland Monitoring Team conducted a survey to assess management issues and threats to Service lands. Survey results identified smooth brome invasion as the most common threat to native prairie. Following a 2-day technical meeting (the “Brome Summit”) to discuss the ecology and control strategies for smooth brome, the NPAM (Native Prairie Adaptive Management) project was initiated. The NPAM project is a large-scale investigation of the efficacy of various management treatments used to promote recolonization by native species on prairie that has never been broken and cropped. The NPAM project has been widely adopted and broadly supported as a strategy for effectively addressing management issues that are common to all Service lands in the Prairie Pothole Region. The project’s 2009 pilot year involved all Service stations in North Dakota and South Dakota. This project serves as a model of collaboration to efficiently address priority research needs in the future within the context of adaptive management. Like the NPAM project, future multi-station research and adaptive management endeavors should incorporate study designs that enable vegetation response to multiple treatments to be measured over time and across gradients in landscape characteristics (such as soils and precipitation). Permanent research plots should be established so that research is not terminated before the synergy of complementary treatments can be fully assessed.
  - Another adaptive management research project focused on an invasive species is the Reed Canary Grass Adaptive Management project. Begun in 2007, this project involves participants from 10 refuges in 2 regions (Regions 3 and 6). Its purpose is to ensure that efforts to control reed canary grass are well informed and are improved upon over time through the use of predictive models and a feedback monitoring design. This learning process is the best approach to employ when management outcomes are uncertain.
- Examples of specific research needs identified during the CCP process include the following:
- Gain a better understanding on the hydrology of prairie pothole wetlands.
  - Commit to participate in large-scale, collaborative adaptive management projects, such as the NPAM project, throughout the life of this CCP to address these identified research needs:
    - Efficacy of various management treatments (specifically grazing, prescribed fire, graze-burn combination treatments, haying, and rest) in controlling introduced cool-season grasses on native prairie.
    - Frequency and intensity of management treatments for restoring native prairie:
      - Are there optimal treatment intervals that will maximize progress toward restoration of native herbaceous plants on native prairie without otherwise adversely affecting the biological integrity, diversity, and ecological health of the prairie ecosystem?
    - Threshold levels for infestation of native prairie by introduced cool-season grasses:
      - Is there a level of invasion beyond which the restoration of native prairie to a moderately diverse, native herbaceous flora is an unrealistic goal?
      - Are there biological indicators of a native prairie that is “too far gone” to be successfully restored without unreasonably excessive or expensive intervention?
    - The efficacy of herbicide treatment for toadflax:
      - What is the best timing for spraying toadflax for optimal control while minimizing adverse effects on native herbaceous plants?
      - Evaluate spot spraying versus blanket spraying in native prairie—will native grasses and forbs recover if widespread spraying is used to aggressively treat the toadflax threat?
      - The role of fire in controlling toadflax and Canada thistle.
  - In addition to vegetation sampling and bird surveys, investigate other indicators of biological diversity, integrity, and ecological health that can be easily measured in the field to assess overall health of a prairie ecosystem or to monitor progress towards restoration.
  - Investigate effects of climate change on prairie potholes, including the identification of indicator species to monitor in assessing such effects.
  - Identify or develop indices reflecting relationships between precipitation-evaporation rates and soil moisture measurements as a means to link vegetation performance with long-term moisture regimes.

Such indicators could be used to guide restoration efforts, vary seed mixtures, or adjust stocking rates for grazing management.

- Evaluate grassland bird response to native prairie restoration:
  - When management treatments prove successful in increasing the native herbaceous cover and suppressing introduced cool-season grasses on a tract of native prairie, do the desired changes in vegetation structure and plant species diversity exert the anticipated positive influence on grassland bird species richness or abundance?
  - Apply modern technology and scientific resources to grassland restoration efforts:
  - Conduct or evaluate research focused on establishing high-diversity stands of native grasses and forbs.
  - Evaluate effectiveness of native seed mixes containing grasses and forbs, and conduct research on wildlife response, focusing on Lepidoptera and grassland-dependent migratory birds (i.e., waterfowl, shorebirds, and songbirds), within 10 years of the CCP's approval.

#### Inventory and Monitoring

Unlike research, monitoring should not be viewed as a clean experiment, but rather as the collection and subsequent application of limited data that have utility in improving management practices. For instance, if we are 75 percent certain that a particular management treatment will result in a desired effect, it is probably wiser to proceed with the assumption that such is the case than to wait until more certain information is available. Monitoring enhances our ability to manage our resources wisely in full knowledge of inevitable uncertainty.

In specific situations, baseline inventory is necessary to improve the biological understanding on which management decisions are based. Aside from such baseline inventory, monitoring should not be viewed as a stand-alone activity, but rather as a targeted component of a larger process of science-based management (Nichols and Williams 2006). Monitoring data are not gathered with a vague hope that somehow they will prove useful for conservation. Instead, monitoring focuses on precisely the information needed to make management decisions. The important issue is efficiency, given the Service's limited resources for monitoring. The power of monitoring is to detect change, or the lack of it, and to define the direction of changes that are good or bad for conservation goals (Doak et al. 2009).

#### Wildlife Disease

As of 2006, each of the three districts has a current wildlife disease contingency plan in place (USFWS 2006). Annual reviews and updates by district staff

will be conducted as new disease information becomes available. With emerging disease threats, Service staff can no longer rely on past, often informal, disease protocols.

#### Wildlife Disease Objective

Annually review and update Disease Contingency Plans.

#### Strategies

- Follow the monitoring and response protocols outlined in Disease Contingency Plans.
- Maintain a supply of personnel protective equipment on hand for emergency cleanup operations.
- Cooperate with USDA APHIS (Animal and Plant Health Inspection Service) Wildlife Services and SDGFP for response to HPAI (Highly Pathogenic Avian Influenza, or bird flu), where possible.
- Continue to support SDGFP with CWD (chronic wasting disease) surveillance.

#### Rationale

Bird disease response is a readily evolving process. Prior to 2006, districts dealt primarily with two diseases in the avian communities: West Nile virus (WNV) and avian botulism. WNV is a flavivirus with an enzootic cycle that involves primarily mosquitoes and birds. It was introduced into the Prairie Pothole Region in 2002. By 2003, WNV had been shown to affect 162 species of birds. The ecology of the northern prairie seems to offer favorable conditions for its continued enzootic transmission (Centers for Disease Control and Prevention 2003).

Avian botulism is a disease that affects the peripheral nerves and results in paralysis of voluntary muscles. It is contracted when a bird ingests toxin produced by the bacterium *Clostridium botulinum*. Outbreaks of avian botulism have occurred in the United States since at least the beginning of the 20th century. Botulism outbreaks are often characterized by lines of carcasses on wetland peripheries during the summer when ambient temperatures are high and water levels are receding. Filter-feeding and dabbling waterfowl and probing shorebirds appear to be among the species at greatest risk (Friend and Franson 1999). With safe handling practices, birds affected by botulism and WNV pose a relatively minor threat to the health of individuals directly handling the infected individuals (Domek 1998; Friend and Franson 1999).

With each new disease presenting itself as a threat to Service staff and the general public (for example, the highly pathogenic H5N1 strain of HPAI), concurrent disease responses are developed to coincide with each threat. HPAI is a disease caused by a virus that infects both wild birds (such as shorebirds and waterfowl) and domestic poultry. Each year, there is a bird flu season just as there is an influenza season for humans and, like human influenza, some forms of avian



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*A blue-winged teal taking wing.*

influenza are worse than others (USGS 2006). Recently, the H5N1 strain of HPAI has been found in an increasing number of countries in Europe, Asia, and Africa. This strain is not present in the United States, but is likely to spread to this country (Dr. Thomas Roffe, veterinarian, USFWS, Montana, personal communication). There are a number of ways that the H5N1 strain could potentially reach the United States: (1) wild bird migration, (2) illegal smuggling of birds or poultry products, and (3) travel by infected people or people traveling with virus-contaminated articles from areas where H5N1 already exists (USGS 2006).

Avian cholera is widely distributed and poses a constant threat to migratory bird populations, especially where dense concentrations of birds occur. Avian cholera epizootics (diseases affecting large numbers of animals) were found to be inversely related to densities of semipermanent wetland basins. It is not known with certainty what environmental or physiological factors trigger an outbreak, but it appears to be associated with physiologically stressed birds that are concentrated on a limited number of wetlands (Smith and Higgins 1990).

CWD is a disease of the nervous system in deer and elk that results in distinctive brain lesions. It was first discovered in South Dakota in a captive elk herd in McPherson County during the winter of 1997–98. McPherson County is within the Sand Lake WMD. From 1999 through 2003, more than 300 hunter-harvested deer were tested, but no positive samples were found. The infected herd was traced back to captive elk herds adjacent to the Black Hills. In South Dakota, CWD has only been detected in free-roaming wildlife in Lawrence, Pennington, Custer, and Fall River

Counties and Wind Cave National Park (as of July 2008) (SDGFP 2010). None of these areas is within the boundaries of the three districts. There is potential for CWD to be present but undetected, or eventually to infect deer in the districts. Service staff will adhere to protocols in the “Chronic Wasting Disease Plan for U.S. Fish and Wildlife Service Lands in the Dakotas” (USFWS 2004b) for all CWD-related work. This plan acknowledges SDGFP as the lead in all CWD efforts in the State and describes the Service as a supporting partner. If the threat of CWD increases, refuge staff will cooperate with SDGFP to assess the impact on district populations of white-tailed deer. The districts will continue to make use of the most current information to stay informed of current wildlife disease threats.

## CONSUMPTIVE USES GOAL

*Provide visitors with quality opportunities to enjoy hunting, fishing, and trapping in waterfowl production areas and expand their knowledge and appreciation of the prairie landscape and the National Wildlife Refuge System.*

### Hunting

The Improvement Act identifies six wildlife-dependent recreational (priority) uses—hunting, fishing, wildlife observation and photography, and environmental education and interpretation—that receive enhanced consideration over other general public uses in planning and management of the districts. Hunting is one of the consumptive uses provided for in the Improvement Act.

#### Hunting Objective

Throughout the life of the CCP, maintain or enhance hunting opportunities on WPAs. Continue to provide information about public opportunities for hunting in accordance with State and Federal regulations.

#### Strategies

- Ensure that all WPAs have the most recent version of boundary signage in accordance with current policy.
- Participate in updating the WPA Mapper initiative, which provides electronic information on location and features.
- Explore options to develop or improve infrastructure to support hunting opportunities.
- Explore opportunities for development of universally accessible facilities and locations for hunters with mobility impairments. Work with partners to help fund such facility development.
- Establish criteria for eligibility to use privileges for hunters with mobility impairments, such as drive-in access.
- Keep data current to allow the State to incorporate district information into the SDGFP hunting guide.

**Rationale**

Hunting ring-necked pheasant, prairie grouse, deer, waterfowl, and other migratory gamebirds on WPAs in the districts is very popular. The major hunting seasons for all species are during October through December. A light goose Conservation Order hunting season provides hunters an opportunity to harvest snow geese during the spring migration.

WPAs are open to hunting as authorized by 50 CFR part 32.1. This provision states that WPAs shall annually be open to the hunting of migratory game birds, upland game, and big game subject to the provisions of State law and regulations.

Because the popularity of hunting on WPAs is increasing, crowding is becoming an issue that affects the quality of the hunting experience. Crowds of hunters lead to unsafe hunting conditions and compromised harvest opportunities as game is dispersed.

Pressure for hunting is intensifying on Service lands. The number of nonresident hunters is increasing. In addition, the extent of private property off limits to hunting is increasing, while CRP grassland acres on private lands are decreasing.

To ensure a high-quality hunting experience, it is essential to maintain healthy populations of resident wildlife and migratory birds through habitat management. There is a growing demand for hunting opportunities accessible to hunters with mobility impairments, such as wheelchair-bound hunters. Hunting by young people is already taking place, because the WPAs are managed in accordance with State regulations that include hunt days for youths.

**Fishing**

Fishing is another consumptive use allowed for in the Improvement Act.

**Fishing Objective**

Throughout the life of the CCP, maintain and/or enhance fishing opportunities on WPAs. Continue to provide information about public opportunities for fishing in accordance with State and Federal regulations.

**Strategies**

- Ensure that all WPAs have the most recent version of boundary signage in accordance with current policy.
- Participate in updating the WPA Mapper initiative, which provides electronic information on location and features.
- Keep data current to allow the State to incorporate district information into the SDGFP fishing guide.
- The Madison WMD will continue to work with the State to maintain healthy fish populations through the Natural PONDS Program by special use permit).



*South Dakota Game, Fish and Parks supports youth hunting through a variety of programs.*

**Rationale**

A few of the more permanent lakes in the districts provide fishing for northern pike, perch, walleye, and a few other species during high precipitation years. Parts of these lakes may be on WPAs. Fishing in districts is available summer and winter. Winter ice fishing is far more popular than fishing during warmer weather. These areas are open to fishing according to State regulations and special refuge regulations. SDGFP's Natural PONDS fisheries program is permitted on 11 wetlands in the Madison WMD. Fry and adult crappies, perch, bluegills, and walleyes are stocked in the spring and then retrapped as fingerlings and adults and stocked into local lakes that can support a fishery.

**Trapping**

Trapping is a consumptive use allowed for in the Improvement Act.

**Trapping Objective**

Throughout the life of the CCP, maintain or enhance trapping opportunities on WPAs. Continue to provide information about public opportunities for trapping in accordance with State and Federal regulations.

**Strategies**

- Ensure that all WPAs have the most recent boundary signage in accordance with current policy.
- Participate in updating the WPA Mapper initiative, which provides electronic information on location and features.
- Keep data current to allow the State to incorporate district information into the SDGFP hunting guide.

**Rationale**

WPAs are open to trapping as authorized by 50 CFR part 31.16. This provision states that WPAs shall be open to public trapping without Federal permit, and that each person trapping shall possess the required State license or permit and shall comply with the provisions of State laws and regulations.



© Chris Bailey

The great blue heron is an iconic symbol of wetlands across the country.

## NONCONSUMPTIVE USES GOAL

Provide visitors with quality opportunities to enjoy, observe, photograph, and appreciate the prairie ecosystem while expanding their knowledge of and support for the National Wildlife Refuge System.

### Photography and Wildlife Observation

Among the six priority uses identified in the Improvement Act, several are consumptive and several are non-consumptive. Photography and wildlife observation constitute a nonconsumptive use.

#### Photography and Wildlife Observation Objective

Throughout the life of the CCP, develop, maintain, and enhance visitor opportunities for wildlife observation and photography.

#### Strategies

- Within 3 years of CCP approval, the Huron WMD will develop a new general brochure.
- Within 1 year of CCP approval, the Madison WMD will develop a new general brochure.
- Ensure that the public is aware of wildlife observation and photography opportunities at the districts and identify observation areas open to the public through signage, publications, and maps.
- Incorporate district lands into the regional birding trail pamphlets by promoting WPAs as stops. Seek out partners to establish and promote birding trails.
- Provide checklists to inform visitors of seasonal wildlife presence and abundance.
- Each district will host a bird identification event annually.
- Develop website-based observation materials such as bird lists and information, locations of observation blinds, maps, and web cams.
- Where feasible, develop a simple map for each district's visitor center or contact station where



Bridgette Flanders-Wanner/USFWS

A photographer on Vaillancourt-Schneck Memorial Natural Trail.

visitors can record what they saw and where (for example, a laminated map that people can write on with a dry-erase marker or magnet board).

- Where feasible, provide a computer kiosk where visitors can access birding information (for example, songs using Thayer birding software).
- The Huron WMD will prepare a feasibility study for the establishment of an observation blind for prairie chickens on the Harter WPA within 2 years of CCP approval.
- The Huron WMD will pursue the development of a birding trail for visitors with visual impairments.

#### Rationale

WPAs provide visitors with tremendous opportunities for viewing and photographing wildlife species that make the prairies and wetlands of the Prairie Pothole Region their home. Excellent opportunities can be found in all three districts, which together reach from the Minnesota/South Dakota border west across the Missouri River. Spring is an especially good time to visit WPAs and see a wide variety of abundant migratory birds as they migrate north to their summer breeding grounds. Remote prairie potholes with wildflowers displaying their colors on tracts of native prairie can provide beautiful and inspiring vistas that are preserved for the enjoyment of future generations.

Appendix A contains the draft compatibility determination for wildlife observation and photography.

Wildlife observation and photography are both wildlife-dependent recreational (priority) uses listed in the Improvement Act. In fiscal year 2008, wildlife photography alone accounted for more than 3,000 visits to the three districts. Facilities that support these activities include visitor centers, interpretive displays, auto routes, overlooks and observation platforms, and informational kiosks.

## OPERATIONS AND ADMINISTRATION GOAL

*Through effective communication and innovative partnerships, secure and efficiently utilize funding, staffing, and volunteer programs for the benefit of all natural resources in the districts.*

### Land Protection

The Huron, Madison, and Sand Lake WMDs are three of 37 districts throughout the Prairie Pothole Region. They were established by the legislation that authorized the Small Wetlands Acquisition Program to save wetlands from various threats, particularly draining. The passage of Public Law 85-585 in August 1958 amended the Migratory Bird Hunting and Conservation Stamp Act (Duck Stamp Act) of 1934, allowing for the acquisition of WPAs and “Easements for Waterfowl Management Rights” (easements). The nation’s first WPA was acquired in the Waubay study area (now known as the Waubay WMD) when the 160-acre McCarlson WPA in Day County was purchased from Arnold McCarlson on January 19, 1959. The Wetlands Loan Act (P.L. 87-383), passed on October 4, 1961, allowed for the advancement of funds against future revenues from Duck Stamp sales. As a result, the first wetland management districts were created in 1962.

### Wetland Easement Objective

Throughout the life of the CCP, each district will secure perpetual conservation easements on 1–5 percent of remaining unprotected, high-priority wetland acres.

### Strategies

- Continue to focus the protection of wetlands using conservation easements in areas where the Service is also protecting priority grasslands. Because of the administrative process involved in calculating values (using the assessed value of the land and a multiplier derived from the relationship between the sales price of similar properties and the assessed values of those properties), it is most efficient for the Service’s Division of Realty to focus acquisition efforts in specific areas (for example, counties) before moving on to other areas. Focusing on specific areas and making multiple offers to many landowners reduces the administrative burden of purchasing conservation easements, thereby increasing the number of acres that can be protected.
- Use mass mailings to prospective sellers in targeted areas with information about the conservation easement program.
- Maintain and update the wetland easement program brochure.
- Maintain lists of willing sellers, some of whom have been waiting several years for an easement offer. Continue to process these offers, based on habitat potential and funding, to protect the highest priority areas.

- Continue to “piggyback” on the Partners for Fish and Wildlife Program as a way to inform prospective sellers of the Service’s conservation easement program. Oftentimes, staff of the Partners for Fish and Wildlife Program is the first point of contact for many landowners who might not otherwise be aware of the conservation programs available to them.
- Continue to use the Service’s strong partnership with SDGFP and NGOs that support the Service’s easement acquisition programs. These NGOs provide a critical link to many sources of funding that can be leveraged to provide additional funds for easement purchases. Notable supporters include Ducks Unlimited, NAWCA (North American Wetlands Conservation Act), The Nature Conservancy, Pheasants Forever, and many other conservation organizations that generate non-Duck Stamp funding to buy conservation easements.

### Rationale

Given a constant acquisition budget over the next 15 years (and using an average acquisition target based on 2008 Division of Realty figures), it is projected that more than 40,000 wetland acres can be protected with conservation easements within the three districts. HAPET (Habitat and Population Evaluation Team) has identified those wetlands that are especially at risk—temporary and seasonal wetlands, often less than 1 acre in size, that are totally or partially embedded in cropland. The pressure to drain and fill these wetlands to support tillage agriculture puts these basins at higher risk of conversion than those in grasslands. At the same time, these wetlands have important value for waterfowl. Based on predictive models developed by HAPET, the Service has prioritized conservation easement acquisitions to focus on the following:

- wetlands that are not protected
- wetlands capable of supporting more than 25 breeding duck pairs per square mile
- wetlands embedded in cropland, where the risk of degradation is especially high
- wetlands at greatest risk of degradation (from drainage and filling): seasonal and temporary basins
- semipermanent and permanent wetlands less than 1 acre in size

According to HAPET, waterfowl pairs in the PPJV are supported on 7.33 million wetland acres, of which 1.49 million acres are currently protected by wetland easements or WPAs. An estimated 1.15 million duck pairs reside in these wetlands, leaving the majority of pairs (3.10 million, or 73 percent) dependent on wetlands that are currently unprotected except through the “Swampbuster” provision of the Farm Bill. Using the criteria above, HAPET identified 1.4 million acres of priority wetlands within the area encompassed by



*Partnerships between the Service and area ranchers are powerful tools to manage wildlife habitat.*

the PPJV that are in greatest need of protection; these wetlands would support 1.5 million duck pairs (figure 18). This number has been adopted as a protection goal by both the Dakota Working Group (a team consisting of refuge managers and project leaders from refuges and districts in South Dakota and North Dakota) and the PPJV (Ringelman 2005).

Securing protected status on 40,000 priority wetland acres in the next 15 years would help the Service advance toward the Dakota Working Group and PPJV goal. Protection of priority wetlands with conservation easements would not only benefit waterfowl, but would also have benefits for other migratory waterbirds. Niemuth et al. (2006) presented results demonstrating the importance of temporary and seasonal wetlands embedded in agricultural landscapes for migrant shorebirds in the Prairie Pothole Region. Specifically, they found that temporary wetlands were selected by migrant shorebirds, but pointed out that presence of water and lack of drainage activity were also strong predictors of shorebird presence.

### **Grassland Easement Objective**

Throughout the life of the CCP, each district will secure perpetual conservation easements on 1–5 percent of remaining unprotected, high-priority grassland acres.

### **Strategies**

- Continue to focus the protection of grasslands with conservation easements in areas where the Service is also protecting priority wetlands. Because of the administrative process involved in calculating values (using the assessed value of the land and a multiplier derived from the relationship between the sales price of similar properties and the assessed values of those properties), it is most efficient for the Service's Division of Realty to focus acquisition efforts in specific areas (for example, counties) before moving to other areas. Focusing on specific areas and making multiple offers to many landowners

reduces the administrative burden of purchasing conservation easements, thereby increasing the number of acres that can be protected.

- Use mass mailings to prospective sellers with information about the conservation easement program in targeted areas.
- Maintain and update the grassland easement program brochure.
- Maintain lists of willing sellers, some of whom have been waiting several years for an easement offer. Continue to process these offers, based on habitat potential and funding, to protect the highest priority areas.
- Continue to “piggyback” on the Partners for Fish and Wildlife Program as a way to inform prospective sellers of the Service's conservation easement program. Often, staff of the Partners for Fish and Wildlife Program is the first point of contact for many landowners who might not otherwise be aware of the conservation programs available to them.
- Continue to use the Service's strong partnership with SDGFP and NGOs that support the Service's easement acquisition programs. These NGOs provide a critical link to many sources of funding that can be leveraged to provide additional funds for easement purchases. Notable supporters include Ducks Unlimited, NAWCA, The Nature Conservancy, Pheasants Forever, and many other conservation organizations that generate non-Duck Stamp funding to buy conservation easements.

### **Rationale**

The initial focus of the Small Wetland Acquisition Program was primarily the protection of wetlands through purchasing land in fee title and acquiring perpetual wetland easements. However, data also revealed the importance of upland grasslands to successful nesting of waterfowl. With the continued conversion of grassland to cropland and consistent declines in the populations of grassland-dependent birds, the need to protect adjacent grassland habitats became evident. The Service received authorization and began to acquire grassland easements in South Dakota in 1989.

Like a wetland easement, a grassland easement transfers limited perpetual rights to the Service for a one-time, lump-sum payment. The purpose of a grassland easement is to prevent the conversion of grassland to cropland, while minimally restricting existing agricultural practices.

More specifically, the purposes of a grassland easement are:

- to improve the water quality of wetlands by reducing soil erosion and the use of chemicals and fertilizers on surrounding uplands;

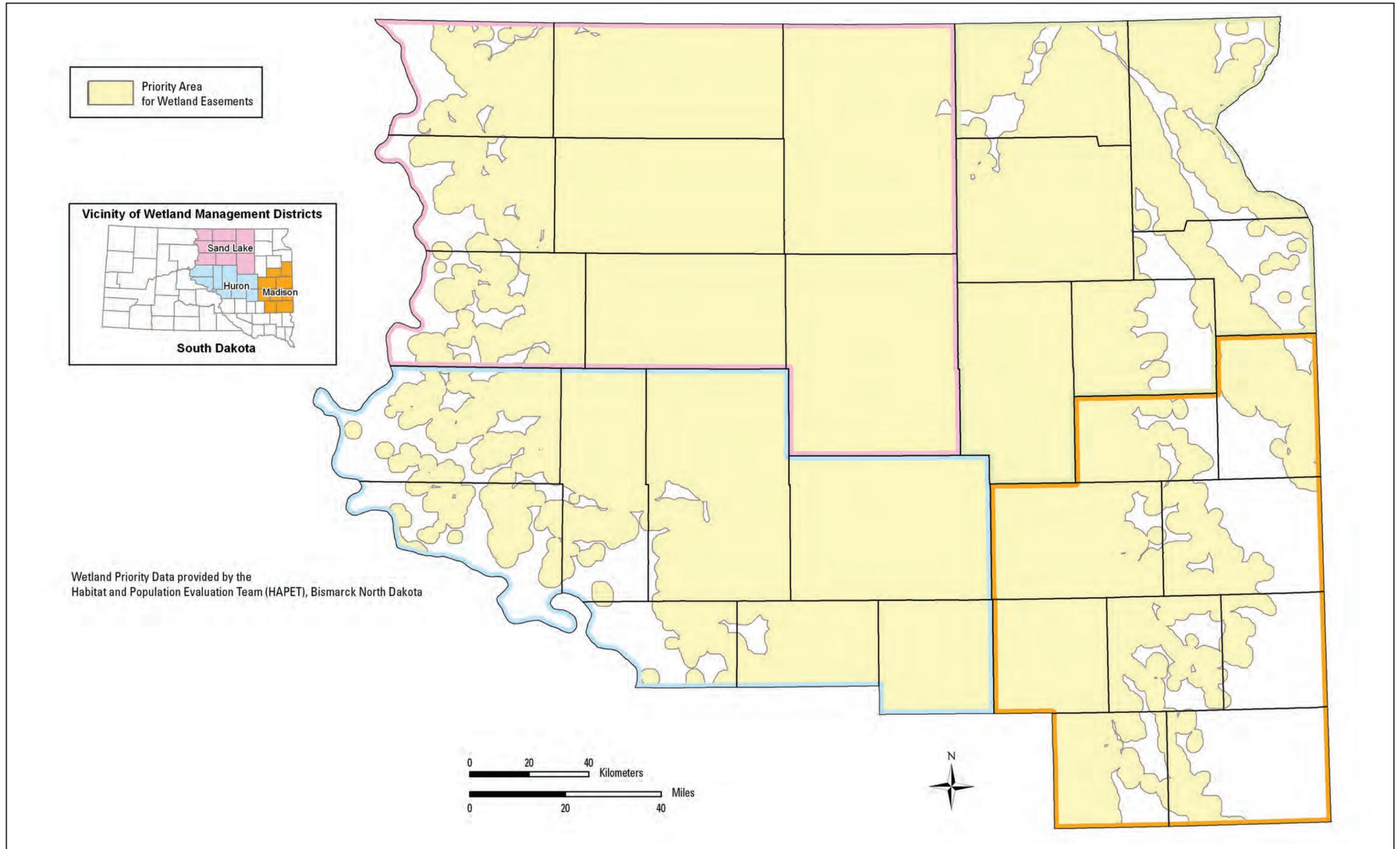


Figure 18. Priority wetlands.

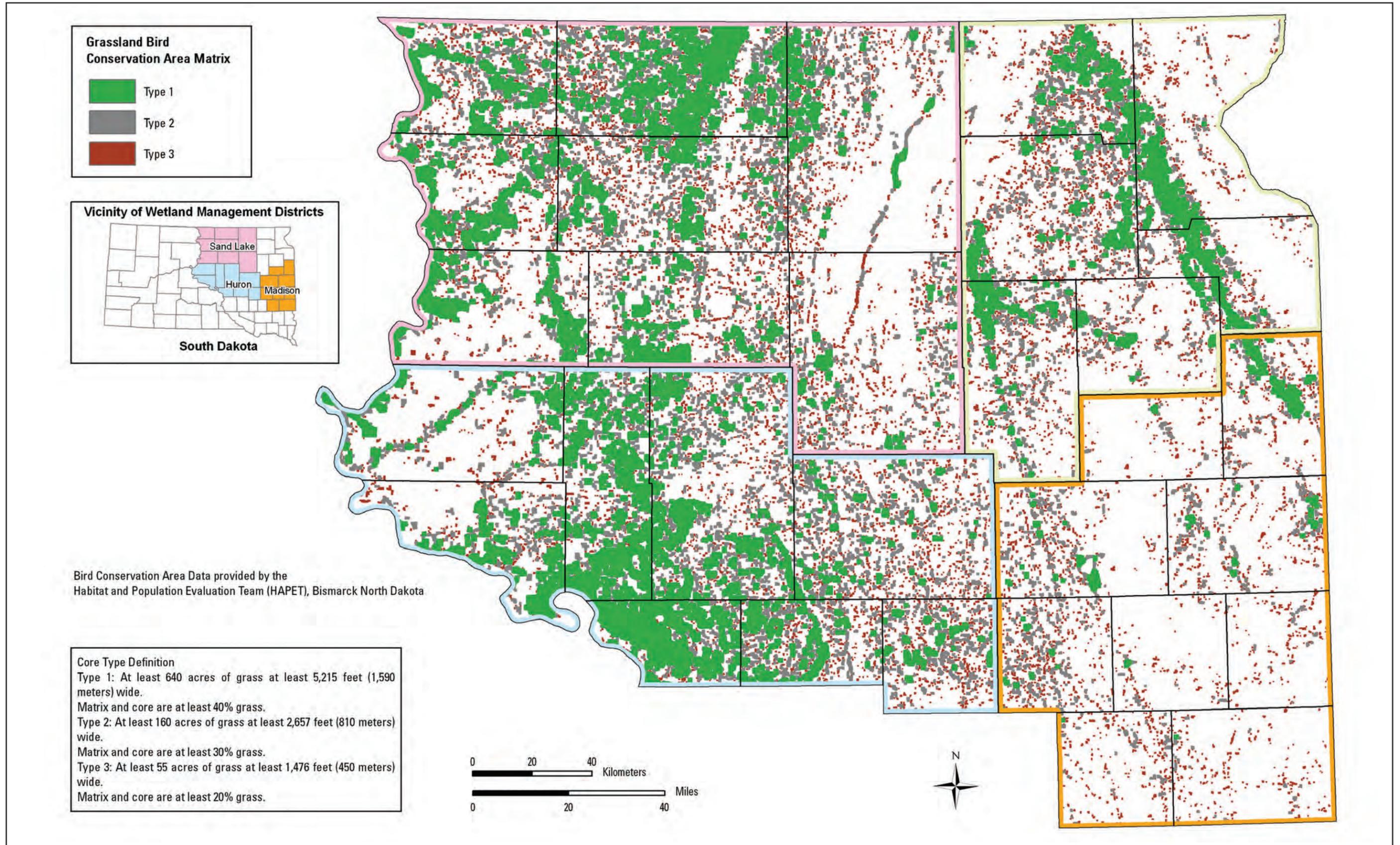


Figure 19. Distribution of priority grasslands.

- to improve upland nesting habitat for all ground-nesting birds, especially waterfowl, and enhance nesting success on private lands;
- to perpetuate grassland cover established by other Federal programs (for example, CRP);
- to provide an alternative to the purchase of uplands in fee title, thus maintaining lands in private ownership.

Grassland easements restrict the landowner from altering the grass by digging, plowing, disking, or otherwise destroying the vegetative cover. Haying, mowing, and seed harvest are restricted until after July 15 of each year. The landowner can graze without restriction (appendix A).

Considering the strong and ongoing partnership with Ducks Unlimited and the consistent success of using their non-Federal money to help acquire NAWCA grants, it is likely the Service's grassland easement program will enjoy stable, if not increasing, funding over the next 15 years. Under these circumstances and using an average acquisition target based on 2008 Division of Realty data, the Service would secure protected status for more than 500,000 grassland acres in South Dakota.

HAPET has developed a model that shows the distribution of priority grassland patches (at least 55 acres) in relation to breeding duck pairs (at least 25 per square mile) (figure 19) and predicts that for every 1 percent decline of priority grassland in the Prairie Pothole Region, there will be 25,000 fewer ducks in the fall. Protection of priority grassland patches not only benefits waterfowl, but also a wide variety of grassland-dependent migratory birds such as western meadowlark (Johnson and Igl 2001).

HAPET identified 11.56 million acres in the PPJV area of North Dakota, South Dakota, and eastern Montana that meet the above criteria. By subtracting grasslands already protected on WPAs or grassland easements, HAPET identified 10.4 million grassland acres in need of protection. The Dakota Working Group and the PPJV (Ringelman 2005) have adopted this figure as a protection goal. Securing protected status on 500,000 acres of priority grassland in the next 15 years would help the Service advance toward meeting this goal.

Additionally, the HAPET model has identified larger grassland areas with respect to area-dependent grassland-nesting birds such as northern harrier, upland sandpiper, and grasshopper sparrow (Johnson and Igl 2001). These areas consist of contiguous grass cover encompassing at least 640 acres with at least 30 percent of the area comprising permanent or semipermanent wetlands. Protection of these large, contiguous blocks of grass within a larger, grassland-dominated landscape should provide adequate protection for a wide range of grassland-dependent migratory bird species that are of management concern (Estey 2007).

### ***Fee Interest Objective***

On average, each district will annually strive to purchase additional land in fee title (WPAs) at a rate of 1 percent over the existing land base.

### ***Strategies***

- Purchase stand-alone or roundout properties with habitat values equal to or greater than existing high-priority WPAs.
- Stand-alone properties could be purchased ahead of a roundout property or any easement.
- Continue to use the Service's strong partnership with others to acquire WPAs through purchase and donation.
- Consider exchange proposals with other conservation organizations with the goal of improving management capability.
- Survey boundaries on all newly acquired and existing WPAs as needed.

### ***Rationale***

WPAs are public lands purchased by the Federal Government for increasing the production of migratory birds, especially waterfowl. The purchase of land—or ownership in fee title—entails the Federal Government holding ownership of land on behalf of the American public. Money to buy WPA lands generally comes from the public purchase of Federal Duck Stamps. This important program aims to ensure the long-term protection of waterfowl and other migratory bird breeding habitat—primarily in the Prairie Pothole Region of the northern Great Plains. WPAs are open to the public for hunting, fishing, bird watching, trapping, hiking, and most other nonmotorized and noncommercial outdoor recreation.

The majority of WPAs in the Madison, Huron, and Sand Lake WMDs were purchased in the 1960s. Historically, acquisition of WPAs focused on larger semipermanent wetlands; often, very little associated upland was included in the tract. As grassland cover was converted to cropland, the Service recognized the importance of purchasing uplands adjacent to wetlands for waterfowl production. When considering a WPA purchase from willing sellers, the Service ranks sites with native prairie, rare wildlife and plant species, a diversity of temporary and semipermanent wetlands, and areas near or adjacent another WPA as higher priorities for acquisition. Currently, the Service purchases on average one WPA in each district every 3 years.

### ***Funding and Staffing***

Goals, objectives, and strategies described in this chapter are based on full, adequate funding and staff. Current policy for Region 6 refuge operations requires that each station is allocated a base budget comprising no more than 75 percent fixed cost and 25 percent management capability (flexible) funding. Districts

will construct and/or maintain buildings, roads, and other infrastructure at or above Service standards (see Facilities Objective). In addition, districts will purchase new equipment and maintain and replace equipment and vehicles at or above Service standards. Other sources provide additional funding for fire management, law enforcement, volunteers, challenge cost share, biological inventory and monitoring, land acquisition, and deferred maintenance.

The Service's current approved staffing model was used to determine each district's needed staff (appendix H). A national team of System professionals developed a new staffing model to determine the level of staff needed to most effectively operate and manage the variety of field stations in the System. The staffing model used 15 factors to drive workload including the following: number of acres, number of easement contracts, number of acres actively managed, level of invasive species infestations, endangered species, biological management and monitoring, wilderness management, visitor services, and maintenance needs. Data for the model were drawn from the Service's "Annual Report of Lands," "Refuge Annual Performance Plan," "Real Property Inventory," and other Service data sources.

The new staffing model recommends additional staff of 19.5 FTEs for the Sand Lake WMD, 14.5 FTEs for the Huron WMD, and 11 FTEs for the Madison WMD over the next 15 years. During the life of the CCP, it is anticipated that staffing increases will comprise five FTEs for the Sand Lake WMD, four for the Huron WMD, and three for the Madison WMD.

#### **Potential New District Objective**

Within 2 years of CCP approval, the Sand Lake WMD will evaluate the feasibility of establishing a standalone wetland management district.

#### **Strategies**

- Identify a WPA capable of supporting a complete wetland management district headquarters complex consisting of an office/visitor center, operations and maintenance facilities, equipment storage facilities, staff and visitor parking areas, and interpretation areas.
- Prioritize the building and maintenance schedule based on funding projects in the Service Asset Maintenance Management System. Identify an office/visitor center as the top priority construction project.
- Schedule equipment and vehicle replacements to achieve industry standards when normal life expectancy is reached.
- Work with partners and the regional office to obtain funding to fill four additional positions: outdoor recreation planner, law enforcement officer (park ranger), maintenance worker, and refuge operations specialist.

- Prepare a socioeconomic fact sheet of area businesses, schools, and services for personnel recruitment purposes.

#### **Rationale**

The Sand Lake WMD is the largest district in the System, encompassing 692,132 acres of fee-title land and perpetual conservation easements in 10 counties of north-central South Dakota. All personnel, equipment, and facilities are based at the Sand Lake National Wildlife Refuge in extreme northeastern Brown County and are shared with the refuge. While this location adequately serves the refuge, it does not efficiently serve the district. Wetland management districts that share management and facilities with national wildlife refuges suffer a multitude of negative consequences under this organizational structure. In addition to shortfalls in deleted adequate staffing and funding for the district, the mere location of the current Sand Lake Refuge Complex office results in management inefficiencies for adequate land management and biological monitoring. Figure 7 illustrates the distances from the Sand Lake Refuge headquarters to district fee-title properties and resources. Clearly, this arrangement results in extended travel times, resulting in less management and monitoring, increased fuel costs, and inefficient response times to various district needs. Biological monitoring has been lacking for many years, largely as a result of staff shortages and this geographic arrangement.

Establishing a district headquarters location in western Edmunds County would greatly enhance all facets of district management. Such a site would be centrally located for the majority of land resources in six counties of the current district. U.S. Highway 12, a primary travel artery through South Dakota, bisects the county from east to west and can provide an increase in visitor services and interpretative contacts for the public. Two small communities—Roscoe and Bowdle—in the western half of Edmunds County offer a variety of services. Three WPAs of suitable size, space, and habitats to provide adequate sites for a district headquarters facility are located on State Highway 47 north of Bowdle.

Properties along U.S. 12 will be investigated for possible acquisition and development of district facilities. Temporary quarters for researchers, seasonal staff, and volunteers would be included in the proposed facilities. These facilities would streamline the logistics required to house fire crew and other personnel supporting interagency cooperative land management/research agreements. In addition, biological monitoring personnel could utilize the facilities for continued research.

Two counties—Brown and Spink—would remain with the Sand Lake Refuge Complex for complete management purposes. These two counties combined

encompass approximately 97,015 acres of fee-title land and conservation easements and can be efficiently managed by refuge staff. The remaining eight counties—McPherson, Edmunds, Faulk, Campbell, Walworth, Potter, Corson, and Dewey—encompass 590,289 acres of fee and conservation easements. The new district—comprising 8 counties rather than 10—would remain the largest district in the System.

## Cultural Resources

### *Cultural Resources Objective*

Throughout the life of the CCP, integrate the process for section 106 of the NHPA into all applicable district projects by notifying the Service's cultural resource staff early in the planning process and, whenever possible, completing the review without delay to the project. Avoid or, when necessary, mitigate adverse effects on significant cultural resources.

### *Strategies*

- Incorporate the NHPA section 106 review process into project development as early as possible and complete the process, as applicable.
- Complete a programmatic agreement with the State Historic Preservation Officer to expedite project review.
- Continue cultural resource review of the districts' projects to identify concerns.

### *Rationale*

The protection and interpretation of cultural resources is important to the public and the Service. Federal laws and policies mandate the consideration and, often, the protection of significant cultural resources.

## Law Enforcement

### *Law Enforcement Objective 1*

Throughout the life of the CCP, protect all wetland and grassland areas under perpetual easement through active monitoring and law enforcement in accordance with the provisions of the conservation easement contracts.

### *Strategies*

- Following the guidelines contained in the "Easement Manual" for enforcement procedures, conduct annual surveillance flights to detect potential conservation easement violations and promptly follow up with needed enforcement action.
- If personnel and funds are available, annually send letters to new landowners informing them of existing conservation easements on their property, including associated easement provisions.
- Proactively map pre-1976 wetland easements and provide maps to landowners along with a copy of the easement contract containing provisions.

- Proactively provide to county USDA offices a map of Service interests showing WPAs and easements. USDA personnel will use maps to identify Service easements prior to granting any wetland drainage requests. Annually update these maps.
- Conduct aerial flights to obtain digital photography of all wetland easements.
- If personnel and funds are available, annually contact the county road supervisors to see if they have any federally funded road projects that might affect easement wetlands or unprotected wetlands and provide advice to minimize impacts.
- Seek assistance from HAPET for spatial data requests on the locations of Service interests in the pre-planning of wind generator farms, fuel pipelines, overhead distribution power lines, or other large-scale commercial developments.
- Complete a workforce analysis to identify law enforcement staff needs and strengthen these areas through position management, new staff, or both. This will prevent protected wetlands from being lost through violations as a result of insufficient law enforcement staff.

### *Rationale*

When the Small Wetlands Acquisition Program was initiated more than 50 years ago, the Service believed that conservation easements would require little to no maintenance or enforcement efforts. However, it soon became evident that in order to protect the government's interest in these easements, a systematic approach was necessary for easement administration and enforcement.

"Swampbuster" provisions of the Farm Bill (which prohibit conversion of wetlands for the production of commodity crops by Farm Bill participants) notwithstanding, pressures to drain and fill wetlands have continued to intensify. As farm implements such as drills, sprayers, and tractors become larger, landowners increasingly view small isolated wetlands as nuisance spots because they are tired of working around them. Other Farm Bill programs can also unintentionally increase pressure to violate wetland easement provisions. One such program, "prevented planting," provides compensation to a landowner for acres that cannot be seeded to a crop. To qualify for payment, the operator must only make an attempt to farm the acres (oftentimes, these are wetland acres). Simply plowing the ground once in the fall, when wetlands are naturally dry, can constitute an attempt. To facilitate plowing, landowners often burn off the wetland vegetation. It is common for these burns to occur on conservation easement-protected wetlands without the required permit from the administering district, which is a violation of the easement provisions.

In the absence of active and effective enforcement, the Service's conservation easement interests could be lost forever, in contrast to resources that the government owns outright. A 15-year hiatus in enforcement action would likely result in irreparable harm to the Service's easement interests and permanent loss of habitat.

Because most grassland easements protect native prairie, the major enforcement concern is cultivation. While violations involving the conversion of native prairie to cropland are extremely rare, full restoration is arguably impossible (although restoration of grassland is possible to regain compliance with grassland easement provisions, which do not specify native prairie). Accordingly, enforcement is essential to the protection of these habitats. Haying, mowing, or harvesting seed before July 15, in violation of the conservation easement provision, could cause direct losses of grassland-nesting birds, including waterfowl. Haying is not common on native prairie, but it is more likely to occur on tamegrass grasslands. Enforcing early hay violations affords another opportunity to meet and visit with landowners and operators. These contacts may serve to remind landowners and operators of the conservation easement provisions and hopefully prevent more serious violations in the future. Like any law enforcement action, the ultimate goal is voluntary compliance.

#### **Law Enforcement Objective 2**

Throughout the life of the CCP, the districts will protect natural and cultural resources pursuant to all relevant laws, executive orders, regulations, and policies. The districts will provide law enforcement for all consumptive and nonconsumptive public uses on Service lands.

#### **Strategies**

Provide adequate law enforcement coverage of all hunting, fishing, and trapping seasons to ensure compliance with laws and regulations while providing for public safety and welfare.

- Develop extensive methods for signage, to facilitate information transfer, and to address communication needs through the use of kiosks, public use leaflets, and tear sheets explaining regulations and prohibited activities.
- Develop, coordinate, and maintain working relationships with State and local law enforcement authorities and fire departments to protect district properties and Federal trust species.
- Continue to work cooperatively and share information with SDGFP to conduct law enforcement patrols to ensure compliance with regulations.
- Conduct an active migratory bird law enforcement program throughout the districts.

#### **Rationale**

For management purposes, WPAs and permanent conservation easements are organized into wetland management districts. District staff use managed grazing, haying, and prescribed burning to enhance the habitats found on WPAs. WPAs are open to hunting, fishing, trapping, wildlife observation, wildlife photography, environmental education, and interpretation. All other activities are prohibited.

#### **Wildland Fire Management**

##### **Wildland Fire Management Program Objective**

Throughout the life of the CCP, provide adequate collaboration and teamwork between the fire program and refuge program to ensure that the objectives of DOI fire policies and other Federal policies are met. At the same time, the program will attain the following objectives:

- safely suppressing all wildfires within the districts and maintaining an initial attack success rate of 95% or higher on wildfires occurring on Service lands
  - Prior to European settlement, wildfires had the ability to burn vast areas. Today, large fires (more than 300 acres) are still possible, but the likelihood has been reduced primarily as a result of habitat fragmentation. Nevertheless, there is still a high probability of wildfires damaging neighboring property. Due to the small size of Service lands, rapid rates of spread in grass fuels, and potential for wildfire to cross onto neighboring lands, the districts have chosen to suppress all wildfires to reduce potential threats to neighboring private land.
  - Region 6 has identified fire management districts throughout the region. Under this approach, the level of fire management staffing would be determined by established modeling systems based on workload. Data used to determine the workload are based on historical wildfire suppression activities as well as on historical and planned fuel treatments.
  - Realizing that fire management staff and equipment may be placed anywhere within the fire management district, utilizing local refuge staff as well as other Federal and non-Federal partners to assist in wildfire suppression is a priority. The districts will attempt to maintain and encourage fire qualifications for refuge staff. In addition, local agreements between Federal and non-Federal partners will be pursued and/or maintained.
- utilizing BAER (Burned Area Emergency Response) or BAR (Burned Area Rehabilitation ) funding as needed following wildfires

- Wildfires can damage natural and cultural resources and improvements. BAER treatments are intended to protect public safety and stabilize and prevent further degradation of natural and cultural resources. These treatments are considered emergencies and are conducted within 1 year of wildfire containment. BAR treatments are non-emergency efforts conducted within 3 years of wildfire containment to improve fire-damaged lands that are unlikely to recover to management-approved conditions, or to repair or replace minor facilities damaged by wildfire. For example, BAR funding can be used to repair or replace fences damaged by wildfire or to treat burned areas to prevent the spread of invasive plants. The use of BAER and BAR funding will follow National and regional policy and guidance.
- It is anticipated that BAR funding has the greatest potential to be used in the districts.
- completing an updated FMP (fire management plan) that reflects the goals and other objectives identified in this CCP
  - Service policy requires that every unit containing burnable vegetation have an FMP. The FMP is a step-down plan from the CCP and provides guidance in how the fire management program will be instituted to meet National, regional, and refuge goals and objectives. An approved FMP allows the manager to consider a wide range of suppression alternatives and to conduct prescribed fires.
  - The FMP is intended to be dynamic and reflect current policies and situations; therefore, an FMP is periodically reviewed and revised. Required updates and revisions will follow National and regional policy and guidance.
- implementing and monitoring a rotational prescribed burn program over the life of the CCP that supports the fire-dependent communities within the districts
  - Fire is an important natural component in the maintenance and restoration of nearly all the habitats in the districts. The frequency and magnitude of prescribed fires can have a profound impact on a habitat's successional state and the transition from one habitat type to another. Following European settlement, wildfire suppression disrupted the natural disturbance cycle, leading to habitat succession into different seral stages or into different habitat types altogether.
  - Prescribed burning is an effective tool for restoring plant communities to historic benchmark conditions, recycling nutrients, reducing hazardous fuels, reducing the threat of fires at the wildland-urban Interface, reducing or eliminating nonnative vegetation, increasing the growth and production of native plants, reducing woody encroachment, and reducing the risk of catastrophic wildfire. The Improvement Act states that the Service must "ensure that the biological integrity, diversity, and environmental health of the System are maintained." By definition, these include "...the natural biological processes that shape genomes, organisms, and communities..." such as fire.
- implementing and monitoring prescribed fire, chemical, or mechanical treatments, that are conducted to reduce hazardous fuels throughout the districts
  - over the life of the CCP, treating 20 percent of the Service lands adjacent to the South Dakota communities at risk and South Dakota communities of interest (table 11)
    - Hazardous fuels treatments are conducted to reduce the threat of catastrophic wildfire to values at risk. Values at risk may include sensitive habitats and species, cultural resources, Federal and private infrastructure and facilities, and nearby local communities. Fire management and refuge staff will collaborate with affected parties (such as the State of South Dakota Wildland Fire Division and local communities) in developing Community Wildfire Protection Plans and hazardous fuels reduction treatments, as well as adding or removing communities at risk or of interest. Table 11 identifies the communities at risk and communities of interest within the districts.

The HFI (Healthy Forests Initiative) and the Healthy Forests Restoration Act have equipped land managers with additional tools to achieve long-term objectives in reducing hazardous fuels protecting wildland-urban interface areas and restoring fire-adapted ecosystems. The HFI calls for reducing hazardous fuels that feed wildfires and improving forest and rangeland management. The HFI also requires that communities within the wildland-urban interface create "community wildfire protection plans," designating areas adjacent to communities that should receive fuel treatments to prevent wildland fires from burning directly into communities.

The goal is to provide for firefighter and public safety, reduce the potential for wildfires by reducing hazardous fuels on district lands, protect homes in the wildland-urban interface, and accomplish habitat management objectives. To achieve these interconnected goals, fire program staff will collaborate with refuge personnel and seek additional supplemental support (when available) for desired subsequent prescribed burns to manage habitat on unqualified priority units.

**Table 11. Wildland-urban interface communities on Federal communities at risk and South Dakota communities of interest lists.**

<i>County</i>	<i>Community</i>	<i>Federal list</i>	<i>South Dakota list</i>
Beadle	Broadland	X	—
Beadle	Cain Creek Subdivision	X	—
Beadle	Lake Byron Subdivision	X	—
Beadle	Maga-Ta-Hohpi Complex	X	—
Beadle	Virgil	X	—
Brookings	Lake Poinsett	X	—
Brookings	Sinai	X	—
Brown	Hecla	X	—
Buffalo	—	—	—
Campbell	Pollock	X	—
Clark	—	—	—
Codington	—	—	—
Day	Enemy Swim	X	—
Day	Waubay Complex	X	—
Deuel	Astoria	X	—
Deuel	Lake Cochrane	X	—
Edmunds	Bowdle	X	—
Faulk	—	—	—
Grant	—	—	—
Hamlin	Bryant	X	—
Hand	—	—	—
Hughes	Green Grass Subdivision	—	X
Hughes	Pheasant Run Subdivision	—	X
Hyde	—	—	—
Jerauld	Wessington Springs	—	X
Kingsbury	DeSmet	—	X
Lake	Chester	—	X
Lake	Madison	—	X
Lake	Nunda	—	X
Lake	Peninsula Point Subdivision	X	—
Lake	Ramona	—	X
Lake	Sunset Harbor Subdivision	X	—
Lake	Wentworth	—	X
Marshall	Lake City	X	—
Marshall	Red Iron	X	—
McCook	—	—	—
McPherson	Eureka	X	—
McPherson	Long Lake	X	—
Miner	—	—	—
Minnehaha	Buffalo Lake	—	X
Moody	—	—	—
Potter	—	—	—
Roberts	Big Coulee	X	—
Roberts	New Effington	X	—

**Table 11. Wildland-urban interface communities on Federal communities at risk and South Dakota communities of interest lists.**

<i>County</i>	<i>Community</i>	<i>Federal list</i>	<i>South Dakota list</i>
Roberts	Long Hollow	X	—
Roberts	Summit	X	—
Sandborn	—	—	—
Spink	—	—	—
Sully	—	—	—
Walworth	—	—	—

Fire management and habitat management are separable processes; accordingly, the strategies for prescribed fire and wildfire were developed to support the achievement of meeting the goals of the NFP (National Fire Plan) while adhering to Federal policy and habitat objectives for uplands, river bottoms, riparian areas, wetlands, and shorelines.

### Strategies

- Fire program managers will work together with management and biological staff to find ways to prioritize and rank the most valuable treatment units in the districts and ensure that Federal fire policies are included in the process if hazardous fuels reduction funds or wildland urban interface funds are to be used.
- Upon completion of the CCP, the FMPs will be revised using the most current information. The FMPs will be updated as determined by policy. The of the Huron Fire District and the Mid Dakota District FMPs are step-down plans from the CCP.
- As new lands are acquired and new housing developments are built adjacent to Service lands, both fire program managers will be responsible for identifying these new communities at risk and working with the State of South Dakota Wildland Fire Division to have them added to the State list of communities at risk or communities of interest.
- Treat 20% of the Service lands adjacent to the South Dakota communities at risk and the South Dakota communities of interest (table 11)
- Utilize a Department of Interior Fuels Prioritization Process and in cooperation with local and private cooperators carry out fuel reduction projects on Service lands adjacent to the Federal Register list of communities at risk and communities of interest in South Dakota (table 11).
- The three districts encompass 445 WPAs totaling approximately 101,094 acres. To obtain an average fire return interval of 5 years across all the lands, the Service would need to burn roughly 20 percent, or 20,018 acres, per year to maintain grasslands, hazardous fuel loadings, and wildland urban interface fuels at the appropriate level. This approach would assist with the suppression of unwanted wildfires and help to keep the lands in a more natural condition based on historical records. However, current staffing and budget levels do not support this level of prescribed burning. At a minimum, the districts should attempt to burn 10,100 acres annually; this level would approach the 10-year interval. Other treatments are available to produce similar landscape effects.
- Use a combination of treatments, including prescribed fire, mechanical treatment, and chemical treatment, for the reduction of hazardous fuels and wildland-urban interface fuels. This will assist with the suppression of unwanted wildfires and will help the land return to a more natural condition. Mechanical treatments include the following:
  - Chainsaw work to cut down trees and shrubs in an attempt to remove woody biomass.
  - Heavy equipment, such as bulldozers, can be utilized to remove trees and shrubs.
  - Tractors with mulching heads or masticators that will grind the woody biomass into mulch could be used to reduce hazardous fuels.
  - Haying could be used to reduce the heavy thatch that builds up in upland areas when fire and grazing are not applied as a management tool.
- Make excess biomass from mechanical fuels treatments available for public utilization.
- Support communities in acquiring community assistance grants for mechanical treatment of the wildland-urban interface and collaborate with rural fire departments, emergency managers, and the public in hazardous fuel reduction projects.
- Maintain necessary firefighting resources and personnel to ensure they are available to respond to wildfire that threatens lives and property and other values at risk.
- Fire management staff will work with county emergency managers to encourage both counties and individual communities to complete Community Wildfire Protection Plans; these plans will identify mitigation actions that can be taken to assist in protecting communities from catastrophic wildfires.

- When identified treatments for habitat management or maintenance burns do not meet the priorities of national fire policy, project leaders and fire program managers will collaborate and seek additional supplemental support (when available) for desired subsequent prescribed burning needed to meet unqualified refuge habitat management priorities.
- Update and execute cooperative agreements with interagency partners, the counties in the three districts, NGOs, and neighboring landowners for improved collaboration and cooperation.

#### *Rationale*

Having long recognized fire as a key process that shapes wildlife habitat structure and function, the Service has managed and used fire extensively for the past 70 years. Guiding principles of fire management in the Service include responsible stewardship, hazardous fuel reduction, wildland-urban interface management, and habitat management strategies based on conserving ecological integrity, meeting the objectives of the NFP, and establishing effective partnerships.

The emphasis of the Service's fire management program has shifted from one of suppression to the use of prescribed fire and wildfire as management tools to achieve national fire policy objectives, habitat objectives, and landscape-level change.

Fuel treatments need to be properly planned using an interagency and interdisciplinary approach when possible and practical, using an integrated approach across different programmatic areas.

The 2010 U.S. Fish and Wildlife Service Fire Management Handbook established a statement of intent: "Fuels treatments should properly be planned on an interdisciplinary basis and be integrated as much as practicable with other resource management activities, and serve to implement the appropriate Comprehensive Conservation Plan. With the guidance from the Service Fire Management Handbook, fire management staff will strive to work closely with all other staff in the district to plan prescribed fire activities in a way that will reduce the risk of wildfires and also have positive results in the area of habitat management."

#### **Other Uses**

##### ***Other Uses Objective***

Over the life of the CCP, districts will apply policy (such as appropriate uses and compatibility determinations) to evaluate other proposed uses.

#### **PARTNERSHIPS GOAL**

*Promote and develop partnerships with landowners, public and private organizations, and other interested individuals to maintain, restore, and enhance a diverse and productive landscape in the Prairie Pothole Region.*

#### **Partnerships Objective**

Throughout the life of the plan, create opportunities for new and maintain existing partnerships among Federal, State, and local agencies; Friends groups; organizations; schools; corporations; communities; and private landowners to promote the understanding and conservation of ecosystem and Refuge resources, activities, and management.

#### *Strategies*

- The Sand Lake WMD will develop a Friends group within 5 years of CCP approval in combination with Sand Lake National Wildlife Refuge.
- The Huron WMD will expand membership in the Friends of Maga-Ta-Hohpi.
- The Madison WMD will engage existing partners and seek additional staff support.
- All three districts will pursue new partnerships to accomplish mission goals and purposes.

#### *Rationale*

Many of the districts' wildlife, habitat, and visitor services programs would not continue without support from partners. Without partners' support and their non-Federal funding, many of the habitat protection, restoration, and enhancement projects would go unfunded. Over time, the diversity of wildlife species would begin to decline as habitat degrades in the absence of adequate management. Partners also lend public support for fee-title acquisitions in front of county commission hearings.

The three districts span much of the South Dakota landscape with fee-title ownership and wetland and grassland easements. The district management activities have the potential to affect neighbors and communities. Effective communication—both through media outlets and on an individual basis—is essential for successful management and fulfillment of the System mission and goals. Staff participate in local events and activities that maintain and support district programs.

The Service assigns personnel to the Partners for Fish and Wildlife Program, an internal Service partner that works with neighboring private landowners. This program helps with restoration and enhancement of habitat to benefit Federal trust species, while also helping System units through a landscape-scale approach to conservation. The Partners Program provides technical assistance to private landowners to give them the information they need to apply for other habitat improvement programs. In addition, Partners Program personnel work with private landowners interested in perpetual conservation easements held by the Service to maintain wetland and grassland ecosystems for future generations. Private lands adjacent to System lands benefit species that require larger landscapes for their survival. These partnerships benefit many sensitive fish and wildlife species.

### **Volunteer Programs Objective**

Throughout the life of the CCP, recruit volunteers to support annual events; visitor services; and biological, maintenance, and administrative programs.

#### **Strategies**

- Districts will develop formal relationships with colleges and universities to access volunteers through internship opportunities.
- Districts will develop formal relationships with secondary schools, individuals, and other organizations (such as Scouts and civic groups) to access volunteers with diverse experience.
- Each station will hire an outdoor recreation planner, one of whose responsibilities will be volunteer coordination.

#### **Rationale**

The Volunteer and Community Partnership Enhancement Act (1998) amends the Fish and Wildlife Act of 1956 to promote understanding and conservation of fish, wildlife, and plants and cultural and historical resources of the Refuge System. The purposes of the Act are to (1) encourage the use of volunteers to assist in the management of refuges, (2) facilitate partnerships between the refuge and non-Federal entities, (3) promote public awareness of refuge resources and public participation in the conservation of the resources, and (4) encourage donations and other contributions. The Improvement Act authorizes the use of volunteers on Service projects and appropriations to carry out a volunteer program.

Those that volunteer for the Service generally do so in the area of visitor services. Visitor services

require extensive Service staff time to coordinate, develop, and maintain. Volunteers ease some of those time requirements. Volunteers are also important for conducting biological surveys.

Volunteers for the districts are:

- individuals who want to give back to their communities;
- parents who want to be good stewards of the land and set examples for their children;
- retired people willing to share their wealth of knowledge;
- concerned citizens of all ages who want to learn more about conservation;
- passionate people who enjoy the outdoors and want to spread the word about America's greatest natural treasures;
- students who wish to gain experience to aid with future employment.

### **ENVIRONMENTAL EDUCATION AND INTERPRETATION GOAL**

*Provide quality educational opportunities for persons of all abilities to learn about, understand, and appreciate prairie landscapes and the role of the National Wildlife Refuge System.*

#### **Programs**

##### **Programs Objective**

Throughout the life of the CCP, promote public awareness of and support for the Refuge System, an appreciation of district natural and cultural resources, and an understanding of management activities that conserve habitat and wildlife.

##### **Strategies**

- Within 2 years of CCP approval, the Madison WMD will install interpretive panels along the Madison WPA auto tour route.
- Within 5 years of CCP approval, the Huron WMD will install interpretive panels and accessible observation platforms along the Maga-Ta-Hohpi WPA hiking trail.
- Within 5 years, the Madison and Sand Lake WMDs will improve and install interpretive exhibits in their VCSs (visitor contact stations).
- Within 3 years, the Huron WMD will design and install new interpretive exhibits in their new office/VCS at Maga-Ta-Hohpi WPA.
- Within 3 years, the Huron WMD will design and install new interpretive exhibits at the Prairie Chicken Observation Area on the Harter WPA.
- Within 3 years of CCP approval, the Huron WMD will develop a new general brochure.
- Within 1 year of CCP approval, the Madison WMD will develop a new general brochure.



Bridgette Flanders-Wanner/USFWS

*A volunteer with the Friends of Maga-Ta-Hohpi staffs an interpretive station.*



© Sandy Uecker

*Wildlife biologist Laura Hubers introduces some new friends at Huron Prairie Fest.*

- Develop district-oriented portable displays for staff use at events to educate the public.
  - Conduct programs such as teacher and student workshops, waterfowl identification workshops, water festivals, South Dakota outdoor expo, and annual noxious weed awareness workshops.
  - Within 5 years of CCP approval, identify the key WPAs in the districts that could support visitor use information such as signage and information kiosks. By 10 years after CCP approval, develop this visitor use infrastructure.
  - Keep data current to allow the State to incorporate district lands information in the appropriate State public use guides.
  - Work with the South Dakota tourism department to promote the WPAs and their resources.
  - The Sand Lake WMD will prepare a feasibility study for the establishment of an outdoor classroom on the Eureka Demo WPA within 2 years of CCP approval. If such an undertaking is considered feasible, develop an outdoor classroom on portions of the Eureka Demo WPA in McPherson County for use by area students (grades K–12). Establish a wide range of project partnerships and sponsors that will support and promote classroom use as well as foster an appreciation of the prairie pothole ecosystem and awareness of the National Wildlife Refuge System. (see Facilities Objective)
  - Update each district website on a quarterly basis. Upgrade to websites to Service standards and customize for each district. Explore the use of pod- and webcasting and social media.
  - Participate in updating the WPA Mapper initiative, which provides electronic information on location and features.
  - Conduct information sharing with the media (such as local newspapers), chambers of commerce, congressional contacts, and tourism outlets.
- Disseminate educational materials (for example, wetland and prairie trunks) for use by teachers, Scout leaders, and others to help them educate their students and group members independently.
  - Promote programming that incorporates the “Connecting People with Nature” national and State initiatives in both structured and unstructured ways. Encourage family visits to and family awareness of the districts.
  - Seek out partnerships to encourage expansion of environmental education programs among local schools. Build on existing relationships with schools for both onsite and offsite programming. Promote education at an early age about natural resources and wetland management districts.
  - Develop programs and provide facilities for distance learning opportunities.
  - Continue to promote the junior Duck Stamp program.
  - Develop slides and DVDs to promote the districts for use in such venues as movie theater intermissions, tourism kiosks, and visitor centers.
  - Each station will hire an outdoor recreation planner, one of whose responsibilities will be volunteer coordination.

#### *Rationale*

Environmental education and interpretation are two of the six wildlife-dependent recreational (priority) uses listed in the Improvement Act. Parents, educators, and civic groups have been visiting WPAs for educational outdoor experiences for many years. Environmental education is usually conducted onsite with school, Scout, and civic groups when they are touring the districts’ headquarters. Offsite programs are conducted by district staff when time is available; these programs are very popular with various groups. Because the districts do not have outdoor recreation planners, they are not able to provide structured, curriculum-based environmental education and have to deny some requests for environmental education programs.

The districts use self-guided exhibits, interpretive panels, and brochures as well as interpretative programming and special events to help foster appreciation, support, and understanding of district-specific topics and the System. Failure to understand the purpose and mission of the WPAs and the Service can lead to a lack of support and, ultimately, to indifference or opposition to management policies. The Service is often confused with SDGFP; through better educational efforts, the public would understand the Service’s mission and how it differs from that of SDGFP. With better understanding, the public can be better informed about fish and wildlife issues in general and on-the-ground management activities in particular.

As it increases in popularity and accessibility, the internet is an ever more valuable tool for keeping the public informed about district programs and resources.

The three districts received more than 426,000 visitors during fiscal year 2008. Their proximity to urban areas such as Sioux Falls, Aberdeen, and Huron affords the districts excellent opportunities for outreach and education through establishment of new facilities and update of existing facilities. Expanding residential development challenges the districts' habitat and wildlife goals; however, this increased population also presents an opportunity to offer wildlife-dependent recreation to more people, leading to a greater understanding of and appreciation for the natural world and wildlife conservation.

### **Facilities**

The districts are near urban areas such as Sioux Falls, Aberdeen, and Huron. The districts have potential for outreach and education through establishment of new facilities and update of existing facilities.

Few people know about wetland management districts or why they exist. Even fewer students or teachers take advantage of WPAs that may be located near rural schools. This objective would actively promote environmental education opportunities and develop new programs for use either in area schools or on WPAs near schools. Such efforts would provide new opportunities for many rural schools and increase exposure of students to today's environmental challenges, as well as the benefits of protecting our natural resources. Interpretive signage and a birding trail would help reach a wider audience, increase tourism dollars, and build appreciation of Service programs. Photography, environmental education, and interpretation are allowed year-round during daylight hours.

Outdoor learning facilities would provide teachers and students within the district with opportunities for hands-on learning about the biological processes of the prairie ecosystem. Teachers educate students who, in turn, pass on to their families what they have learned about prairie ecosystems and the Service's role in protecting them.

### **Facilities Objective**

Throughout the life of the CCP, enrich visitor experiences by maintaining and/or enhancing existing facilities, as well as identifying locations for additional amenities.

### **Strategies**

- Ensure that all WPAs have the most recent version of boundary signage in accordance with current policy.
- Work with SDDOT (South Dakota Department of Transportation) to install highway directional signage as appropriate.

- Inventory all districts to determine what facilities are in place and where new or updated facilities are needed.
- Design and construct all facilities with sustainable building standards and incorporating alternative energy sources.
- Remove all artificial structures that are no longer functional and revegetate those sites as needed.
- To address safety concerns, identify and plug all nonfunctional wells throughout the districts as appropriate.
- Identify and site parking lots on WPAs to facilitate public use and safety. Construct additional parking lots as needed.

### **Huron WMD**

- Secure funding to design and construct an administrative office and VCS on the Maga-Ta-Hohpi WPA. This facility would include an entrance road/parking facility, entrance sign, kiosk, additional storage building, volunteer trailer pad, interior exhibits, furniture, and audiovisual equipment. It would also house and support the Huron Wetland Acquisition Office. The new construction would take place on a site adjacent to U.S. Highway 14 after a thorough engineering review of potential locations.
- Design and construct a hiking trail from the VCS to the existing interpretive trail.
- Explore the feasibility of an accessible observation deck near the VCS.
- Explore the feasibility of an accessible observation deck on the Maga-Ta-Hohpi WPA.
- Design and construct an informational kiosk at the Harter WPA, incorporating accessible facilities.
- Construct an accessible trail from the Friends Group shelter to the environmental classroom.
- Install a potable water line to the Friends Group shelter and the environmental classroom. This project would include construction of an outdoor drinking fountain and hand washing station.

### **Madison WMD**

- Within 2 years of CCP approval, work with SDDOT to install double yellow no passing zones by the office and rest stop entrances for visitor and staff safety.
- Within 5 years of CCP approval, design and construct office/VCS expansion (including expanded parking lot, furniture, satellite dish, larger screen TV with projector, and interior exhibits).
- Upgrade and maintain the existing headquarters entrance road, kiosk, and parking lot every 5 years through the duration of the CCP.

- Upgrade and maintain the existing asphalt parking lot and entrance road, kiosk, restrooms, and facilities at the Karl Mundt Rest Stop every 5 years through the duration of the CCP.
- Design and construct accessible hiking/biking trails and an observation tower in the Payne WPA in cooperation with the City of Madison within 5 years of CCP approval.
- Design and construct a bunkhouse and two volunteer trailer pads (with water, sewer, and electricity hookups) in the Payne WPA within 5 years of CCP approval.
- Replace, repair, and update kiosks, monuments, and signs on WPAs throughout the district every 5 years through the duration of the CCP.
- Upgrade and maintain roads subject to high levels of public use (such as roads in the Long Lake, Brush Lake, Lake Henry, Madison, Island Lake, Lost Lake, Coteau Prairie, and Payne WPAs) every 2 years for the duration of the CCP.

#### Sand Lake WMD

- Locate, design, and construct a new district headquarters in western Edmunds County within 6 years of CCP approval to provide an office/VCS, maintenance shop, equipment storage, and housing for researchers, volunteers, and seasonal employees in western Edmunds County. The facility would also include entrance road and parking lot, entrance sign, kiosk, additional storage building(s), interior exhibits, furniture, and audiovisual equipment.
- Design and construct an educational/interpretive outdoor classroom facility that would include a parking lot, restroom, contact station, informational kiosk, entrance sign, accessible interpretive/educational trail, boardwalk to the wetland, observation



Bridgette Flanders-Wanner/USFWS

*Service staffer Harris Hoistad builds a shelter.*

deck, and other educational features in the Eureka Demo WPA within 6 years of CCP approval.

- Update and expand the VCS at the Sand Lake National Wildlife Refuge headquarters to incorporate interpretive exhibits and kiosk relating to the Sand Lake WMD within 5 years of CCP approval.
- Expand operations and maintenance facilities at the Sand Lake National Wildlife Refuge headquarters to support additional Sand Lake WMD personnel (including equipment storage, office space, and furniture). This strategy would be a contingency only if the new headquarters strategy is not adopted.

#### *Rationale*

The rationale for developing a new wetland management district office is presented in the discussion of the “Operations and Administration Goal—Potential New District Objective.” The strategies are reiterated here because of their importance to furthering the Service’s environmental education and interpretive priorities in the context of the Sand Lake WMD.

# Glossary

**abiotic**—Pertaining to nonliving things.

**accessible**—Pertaining to physical access to areas and activities for people of different abilities, especially those with physical impairments.

**adaptive management**—Rigorous application of management, research, and monitoring to gain information and experience necessary to assess and modify management activities; a process that uses feedback from research, monitoring, and evaluation of management actions to support or modify objectives and strategies at all planning levels; a process in which policy decisions are implemented within a framework of scientifically driven experiments to test predictions and assumptions inherent in a management plan. Analysis of results helps managers determine whether current management should continue as is or whether it should be modified to achieve desired conditions.

**Administration Act**—National Wildlife Refuge System Administration Act of 1966.

**alternatives**—Different sets of objectives and strategies or means of achieving refuge purposes and goals, helping fulfill the Refuge System mission and resolving issues.

**amphibian**—Class of cold-blooded vertebrates including frogs, toads or salamanders.

**annual**—A plant that flowers and dies within 1 year of germination.

**baseline**—Set of critical observations, data, or information used for comparison or a control.

**biological control**—Reduction in numbers or elimination of unwanted species by the introduction of natural predators, parasites, or diseases.

**biological diversity, also biodiversity**—Variety of life and its processes, including the variety of living organisms, the genetic differences among them, and the communities and ecosystems in which they occur (“U.S. Fish and Wildlife Service Manual” 052 FW 1.12B). The National Wildlife Refuge System’s focus is on endemic species, biotic communities, and ecological processes.

**biological integrity**—Composition, structure, and function at the genetic, organism, and community levels consistent with natural conditions and the biological processes that shape genomes, organisms, and communities.

**biomass**—Total amount of living material, plants and animals, above and below the ground in a particular habitat or area.

**biota**—Animals and plants of a given region.

**biotic**—Pertaining to life or living organisms.

**breeding habitat**—Habitat used by migratory birds or other animals during the breeding season.

**buffer zone or buffer strip**—Protective land borders around critical habitats or water bodies that reduce runoff and nonpoint source pollution loading; areas created or sustained to lessen the negative effects of land development on animals and plants and their habitats.

**canopy**—Layer of foliage, generally the uppermost layer, in a vegetative stand; midlevel or understory vegetation in multilayered stands. Canopy closure (also canopy cover) is an estimate of the amount of overhead vegetative cover.

**CCP**—See comprehensive conservation plan.

**CFR**—See Code of Federal Regulations.

**cfs**—Cubic feet per second.

**climax**—Community that has reached a steady state under a particular set of environmental conditions; a relatively stable plant community; the final stage in ecological succession.

**Code of Federal Regulations (CFR)**—Codification of the general and permanent rules published in the “Federal Register” by the executive departments and agencies of the Federal Government. Each volume of the CFR is updated once each calendar year.

**community**—Area or locality in which a group of people resides and shares the same government.

**compatible use**—Wildlife-dependent recreational use or any other use of a refuge that, in the sound professional judgment of the director of the U.S. Fish and Wildlife Service, will not materially interfere with or detract from the fulfillment of the mission of the Refuge System or the purposes of the refuge (“Draft U.S. Fish and Wildlife Service Manual” 603 FW 3.6). A compatibility determination supports the selection of compatible uses and identified stipulations or limits necessary to ensure compatibility.

**complex**—See refuge complex.

**comprehensive conservation plan (CCP)**—A document that describes the desired future conditions of the refuge and provides long-range guidance and management direction for the refuge manager to

accomplish the purposes of the refuge, contribute to the mission of the Refuge System, and to meet other relevant mandates (“Draft U.S. Fish and Wildlife Service Manual” 602 FW 1.5).

**concern**—See issue.

**conservation**—Management of natural resources to prevent loss or waste. Management actions may include preservation, restoration, and enhancement.

**cool-season grass**—Grass that begins growth earlier in the season and often become dormant in the summer; will germinate at lower temperatures (65–85°F). Examples are western wheatgrass, needle and thread, and green needlegrass.

**cooperative agreement**—Legal instrument used when the principal purpose of the transaction is the transfer of money, property, services or anything of value to a recipient in order to accomplish a public purpose authorized by Federal statute and substantial involvement between the Service and the recipient is anticipated.

**coteau**—A hilly upland including the divide between two valleys; a divide; the side of a valley.

**cover, also cover type, canopy cover**—Present vegetation of an area.

**CRP**—Conservation Reserve Program.

**cultivar**—A plant variety that has been produced in cultivation by selective breeding.

**cultural resources**—Remains of sites, structures, or objects used by people in the past.

**cultural resource inventory**—Professionally conducted study designed to locate and evaluate evidence of cultural resources present within a defined area. Inventories may involve various levels including background literature search (class I), sample inventory of project site distribution and density over a larger area (class II), or comprehensive field examination to identify all exposed physical manifestation of cultural resources (class III).

**database**—Collection of data arranged for ease and speed of analysis and retrieval, usually computerized.

**deciduous**—Pertaining to any plant organ or group of organs that is shed annually; perennial plants that are leafless for sometime during the year.

**defoliation**—Removing of vegetative parts; to strip vegetation of leaves; removal can be caused by weather, mechanical, animals, and fire.

**demography**—Quantitative analysis of population structure and trend.

**dense nesting cover (DNC)**—Composition of grasses and forbs that allows for a dense stand of vegetation that protects nesting birds from the view of predators, usually consisting of one to two species of wheatgrass, alfalfa, and sweetclover.

**disturbance**—Significant alteration of habitat structure or composition. May be natural (for example, fire) or human-caused events (for example, timber harvest).

**DNC**—See dense nesting cover.

**drawdown**—Manipulating water levels in an impoundment to allow for the natural drying-out cycle of a wetland.

**EA**—See environmental assessment.

**easement**—Agreement by which a landowner gives up or sells one of the rights on his/her property.

**ecosystem**—Dynamic and interrelating complex of plant and animal communities and their associated nonliving environment; a biological community, together with its environment, functioning as a unit. For administrative purposes, the Service has designated 53 ecosystems covering the United States and its possessions. These ecosystems generally correspond with watershed boundaries and their sizes and ecological complexity vary.

**emergent**—Plant rooted in shallow water and having most of the vegetative growth above water such as cattail and hardstem bulrush.

**endangered species, Federal**—Plant or animal species listed under the Endangered Species Act of 1973, as amended, that is in danger of extinction throughout all or a significant portion of its range.

**endangered species, State**—Plant or animal species in danger of becoming extinct or extirpated in a particular State within the near future if factors contributing to its decline continue. Populations of these species are at critically low levels or their habitats have been degraded or depleted to a significant degree.

**endemic species**—Plants or animals that occur naturally in a certain region and whose distribution is relatively limited to a particular locality.

**environmental assessment (EA)**—Concise public document, prepared in compliance with the National Environmental Policy Act, that briefly discusses the purpose and need for an action and alternatives to such action, and provides sufficient evidence and analysis of impacts to determine whether to prepare an environmental impact statement or finding of no significant impact (40 CFR 1508.9).

**environmental education**—Education aimed at producing a citizenry that is knowledgeable concerning the biophysical environment and its associated problems, aware of how to help solve these problems, and motivated to work toward their solution.

**environmental health**—Natural composition, structure, and functioning of the physical, chemical, and other abiotic elements, and the abiotic processes that shape the physical environment.

**EO**—Executive order.

**EPA**—Environmental Protection Agency.

**extinction**—Complete disappearance of a species from the earth; no longer existing.

**extirpation**—Extinction of a population; complete eradication of a species within a specified area.

- fauna**—All the vertebrate and invertebrate animals of an area.
- Federal land**—Public land owned by the Federal Government, including lands such as national forests, national parks, and national wildlife refuges.
- federally listed species**—Species listed under the Federal Endangered Species Act of 1973, as amended, either as endangered, threatened, or species at risk (formerly candidate species).
- fee title**—Acquisition of most or all of the rights to a tract of land.
- fire regime**—Description of the frequency, severity, and extent of fire that typically occurs in an area or vegetative type.
- flora**—All the plant species of an area.
- FMP**—Fire management plan.
- forb**—A broad-leaved, herbaceous plant; a seed-producing annual, biennial, or perennial plant that does not develop persistent woody tissue but dies down at the end of the growing season.
- forest**—Group of trees with their crown overlapping (generally forming 60–100% cover).
- fragmentation**—The alteration of a large block of habitat that creates isolated patches of the original habitat that are interspersed with a variety of other habitat types; the process of reducing the size and connectivity of habitat patches, making movement of individuals or genetic information between parcels difficult or impossible.
- FTE**—Full-time equivalent.
- geographic information system (GIS)**—Computer system capable of storing and manipulating spatial data; a set of computer hardware and software for analyzing and displaying spatially referenced features (points, lines and polygons) with nongeographic attributes such as species and age.
- GIS**—See geographic information system.
- goal**—Descriptive, open-ended, and often broad statement of desired future conditions that conveys a purpose but does not define measurable units (“Draft U.S. Fish and Wildlife Service Manual” 620 FW 1.5).
- “go-back” prairie**—Previously cultivated cropland that has been allowed to revert to herbaceous cover.
- GPS**—See global positioning system.
- guild**—A group of species that use a common resource base in a similar fashion within an ecological community. A guild can be generally defined (for example, grassland birds) or specifically defined (for example, seed-eating small mammals).
- habitat**—Suite of existing environmental conditions required by an organism for survival and reproduction; the place where an organism typically lives and grows.
- habitat conservation**—Protection of animal or plant habitat to ensure that the use of that habitat by the animal or plant is not altered or reduced.
- habitat disturbance**—Significant alteration of habitat structure or composition; may be natural (for example, wildland fire) or human-caused events (for example, timber harvest and disking).
- habitat type, also vegetation type, cover type**—Land classification system based on the concept of distinct plant associations.
- hemi-marsh**—The emergent phase of a seasonal or semipermanent wetland where the ratio of open water area to emergent vegetation cover is about 50:50, and vegetation and open water areas are highly interspersed.
- herbivore**—Animal feeding on plants.
- herbivory**—The eating of plants, especially ones that are still living.
- impoundment**—A body of water created by collection and confinement within a series of levees or dikes, creating separate management units although not always independent of one another.
- Improvement Act**—National Wildlife Refuge System Improvement Act of 1997.
- integrated pest management**—Methods of managing undesirable species such as invasive plants; education, prevention, physical or mechanical methods of control, biological control, responsible chemical use, and cultural methods.
- interseed**—Mechanical seeding of one or several plant species into existing stands of established vegetation.
- introduced species**—A nonnative plant or animal species that is intentionally or accidentally released into an ecosystem where it was not previously adapted.
- introduction**—Intentional or unintentional escape, release, dissemination, or placement of a species into an ecosystem as a result of human activity.
- invasive plant, also noxious weed**—Species that is nonnative to the ecosystem under consideration and whose introduction causes, or is likely to cause, economic or environmental harm or harm to human health.
- inviolate sanctuary**—Place of refuge or protection where animals and birds may not be hunted.
- issue**—Any unsettled matter that requires a management decision; for example, a Service initiative, opportunity, resource management problem, a threat to the resources of the unit, conflict in uses, public concern, or the presence of an undesirable resource condition (“Draft U.S. Fish and Wildlife Service Manual” 602 FW 1.5).
- lacustrine**—Relating to, formed in, living in, or growing in lakes.
- lek**—A physical area where males of a certain animal species gather to demonstrate their prowess and compete for females before or during the mating season.
- local agencies**—Municipal governments, regional planning commissions, or conservation groups.
- management alternatives**—See alternatives.

**management plan**—Plan that guides future land management practices on a tract of land. See cooperative agreement.

**mean sea level**—The sea level halfway between average levels of high and low water.

**mechanical control**—Reduction in numbers or elimination of unwanted species through the use of mechanical equipment such as mowers and clippers.

**mesic**—Characterized by, relating to, or requiring a moderate amount of moisture; having a moderate rainfall.

**microhabitat**—Habitat features at a fine scale; often identifies a unique set of local habitat features.

**migration**—Regular extensive, seasonal movements of birds between their breeding regions and their wintering regions; to pass usually periodically from one region or climate to another for feeding or breeding.

**migratory bird**—Bird species that follow a seasonal movement from their breeding grounds to their wintering grounds. Waterfowl, shorebirds, raptors, and songbirds are all migratory birds.

**migratory game bird**—Bird species, regulated under the Migratory Bird Treaty Act and State laws (legally hunted, including ducks, geese, woodcock, and rails).

**mission**—Succinct statement of purpose or reason for being.

**mitigation**—Measure designed to counteract an environmental impact or to make an impact less severe.

**mixed-grass prairie**—Transition zone between the tall-grass prairie and the short-grass prairie dominated by grasses of medium height that are approximately 2–4 feet tall. Soils are not as rich as the tall-grass prairie and moisture levels are less.

**monitoring**—Process of collecting information to track changes of selected parameters over time.

**monotypic**—Having only one type or representative.

**moraine**—Mass of earth and rock debris carried by an advancing glacier and left at its front and side edges as it retreats.

**national wildlife refuge (NWR)**—Designated area of land, water, or an interest in land or water within the Refuge System, but does not include coordination areas; a complete listing of all units of the Refuge System is in the current “Annual Report of Lands Under Control of the U.S. Fish and Wildlife Service.”

**National Wildlife Refuge System (Refuge System)**—Various categories of areas administered by the Secretary of the Interior for the conservation of fish and wildlife including species threatened with extinction, all lands, waters, and interests therein administered by the Secretary as wildlife refuges, areas for the protection and conservation of fish and wildlife that are threatened with extinction, wildlife ranges, game ranges, wildlife management areas, and waterfowl production areas.

**National Wildlife Refuge System Improvement Act of 1997 (Improvement Act)**—Sets the mission and the administrative policy for all refuges in the Refuge System; defines a unifying mission for the Refuge System; establishes the legitimacy and appropriateness of the six priority public uses (hunting, fishing, wildlife observation, wildlife photography, environmental education, and interpretation); establishes a formal process for determining appropriateness and compatibility; establish the responsibilities of the Secretary of the Interior for managing and protecting the Refuge System; requires a comprehensive conservation plan for each refuge by the year 2012. This Act amended portions of the Refuge Recreation Act and National Wildlife Refuge System Administration Act of 1966.

**native species**—Species that, other than as a result of an introduction, historically occurred or currently occurs in that ecosystem.

**NAWMP**—See North American Waterfowl Management Plan.

**Neotropical migrant, also Neotropical migratory bird**—Bird species that breeds north of the United States–Mexico border and winters primarily south of this border.

**NEPA**—National Environmental Policy Act.

**nest success**—Percentage of nests that successfully hatch one or more eggs of the total number of nests initiated in an area.

**nongovernmental organization**—Any group that does not include Federal, State, tribal, county, city, town, local, or other governmental entities.

**North American Waterfowl Management Plan (NAWMP)**—North American Waterfowl Management Plan, signed in 1986, recognizes that the recovery and perpetuation of waterfowl populations depends on restoring wetlands and associated ecosystems throughout the United States and Canada. It established cooperative international efforts and joint ventures composed of individuals; corporations; conservation organizations; and local, State, provincial, and Federal agencies drawn together by common conservation objectives. The Souris River basin refuges are included in the “Prairie Pothole Joint Venture.”

**notice of intent**—Notice that an environmental impact statement will be prepared and considered (40 CFR 1508.22); published in the “Federal Register.”

**noxious weed, also invasive plant**—Any living stage (including seeds and reproductive parts) of a parasitic or other plant of a kind that is of foreign origin (new to or not widely prevalent in the U.S.) and can directly or indirectly injure crops, other useful plants, livestock, poultry, other interests of agriculture, including irrigation, navigation, fish and wildlife resources, or public health. According to the Federal Noxious Weed Act (PL 93-639), a

- noxious weed (invasive plant) is one that causes disease or has adverse effects on humans or the human environment and, therefore, is detrimental to the agriculture and commerce of the United States and to public health.
- NRCS**—Natural Resources Conservation Service of the U.S. Department of Agriculture.
- NWR**—See national wildlife refuge.
- NWRS**—See National Wildlife Refuge System.
- objective**—Concise statement of what is to be achieved, when and where it is to be achieved, and who is responsible for the work. Objectives are derived from goals and provide the basis for determining management strategies. Objectives should be attainable, time-specific, and measurable.
- palustrine**—Refers to a nontidal wetland dominated by trees, shrubs, persistent emergents, and emergent mosses or lichens; or a wetland in tidal areas where salinity due to ocean-derived salts is below 0.5 parts per thousand.
- Partners in Flight**—Western Hemisphere program designed to conserve Neotropical migratory birds and officially endorsed by numerous Federal and State agencies and nongovernmental organizations; also known as the Neotropical Migratory Bird Conservation Program.
- partnership**—Contract or agreement entered into by two or more individuals, groups of individuals, organizations or agencies in which each agrees to furnish a part of the capital or some in-kind service, such as labor, for a mutually beneficial enterprise.
- patch**—Area distinct from that around it; an area distinguished from its surroundings by environmental conditions.
- perennial**—Lasting or active through the year or through many years; a plant species that has a life span of more than 2 years.
- phenology**—The relationship between plant or animal development and climatic conditions.
- planning team**—Team that prepares the comprehensive conservation plan. Planning teams are interdisciplinary in membership and function. A team generally consists of a planning team leader; refuge manager and staff biologist; staff specialists or other representatives of Service programs, ecosystems or regional offices; and State partnering wildlife agencies as appropriate.
- planning team leader**—Typically a professional planner or natural resource specialist knowledgeable of the requirements of National Environmental Policy Act and who has planning experience. The planning team leader manages the refuge planning process and ensures compliance with applicable regulatory and policy requirements.
- planning unit**—Single refuge, an ecologically or administratively related refuge complex, or distinct unit of a refuge. The planning unit also may include lands currently outside refuge boundaries.
- plant association**—Classification of plant communities based on the similarity in dominants of all layers of vascular species in a climax community.
- plant community**—Assemblage of plant species unique in its composition; occurs in particular locations under particular influences; a reflection or integration of the environmental influences on the site such as soil, temperature, elevation, solar radiation, slope, aspect, and rainfall; denotes a general kind of climax plant community (ponderosa pine or bunchgrass).
- PPJV**—“Prairie Pothole Joint Venture.”
- predation**—Mode of life in which food is primarily obtained by the killing or consuming of animals.
- prescribed fire**—Skillful application of fire to natural fuels under conditions such as weather, fuel moisture, and soil moisture that allow confinement of the fire to a predetermined area and produces the intensity of heat and rate of spread to accomplish planned benefits to one or more objectives of habitat management, wildlife management, or hazard reduction.
- priority public use**—See wildlife-dependent recreational use.
- pristine**—Typical of original conditions.
- private land**—Land that is owned by a private individual, a group of individuals, or a nongovernmental organization.
- private landowner**—Any individual, group of individuals, or nongovernmental organization that owns land.
- private organization**—Any nongovernmental organization.
- proposed action**—Alternative proposed to best achieve the purpose, vision, and goals of a refuge (contributes to the Refuge System mission, addresses the significant issues, and is consistent with principles of sound fish and wildlife management). The draft comprehensive conservation plan.
- public**—Individuals, organizations, and groups; officials of Federal, State, and local government agencies; Indian tribes; and foreign nations. It may include anyone outside the core planning team. It includes those who may or may not have indicated an interest in Service issues and those who do or do not realize that Service decisions may affect them.
- public involvement**—Process that offers affected and interested individuals and organizations an opportunity to become informed about, and to express their opinions on, Service actions and policies. In the process, these views are studied thoroughly and thoughtful consideration of public views is given in shaping decisions for refuge management.
- public involvement plan**—Broad long-term guidance for involving the public in the comprehensive planning process.
- public land**—Land that is owned by the local, State, or Federal Government.

**purpose of the refuge**—Purpose specified in or derived from the law, proclamation, executive order, agreement, public land order, donation document, or administrative memorandum establishing authorization or expanding a refuge, refuge unit, or refuge subunit (“Draft U.S. Fish and Wildlife Service Manual” 602 FW 1.5).

**refuge complex**—A grouping of two or more Service units (for example, national wildlife refuge, wetland management district) that is administered by staff at one of the units.

**refuge lands**—Lands in which the Service holds full interest in fee title, or partial interest such as limited-interest refuges.

**refuge purpose**—See purpose of the refuge.

**Refuge System**—See National Wildlife Refuge System.

**region 6**—“Mountain-Prairie Region” of the U.S. Fish and Wildlife Service, which administers Service programs in Colorado, Kansas, Montana, Nebraska, North Dakota, South Dakota, Wyoming, and Utah.

**rest**—Free from biological, mechanical, or chemical manipulation, in reference to refuge lands.

**restoration**—Artificial manipulation of a habitat to restore it to something close to its natural state. Involves taking a degraded grassland and reestablishing habitat for native plants and animals. Restoration usually involves the planting of native grasses and forbs, and may include shrub removal and prescribed burning.

**rhizomatous**—A plant having rhizomes— A continuously growing, horizontal, underground stem that produces roots and sends shoots upward at intervals (for example, many iris species).

**riparian area or riparian zone**—Area or habitat that is transitional from terrestrial to aquatic ecosystems including streams, lakes, wet areas, and adjacent plant communities and their associated soils that have free water at or near the surface; an area whose components are directly or indirectly attributed to the influence of water; of or relating to a river; specifically applied to ecology, “riparian” describes the land immediately adjoining and directly influenced by streams. For example, riparian vegetation includes all plant life growing on the land adjoining a stream and directly influenced by the stream.

**runoff**—Water from rain, melted snow, or agricultural or landscape irrigation that flows over the land surface into a water body.

**sandhills**—Sand dunes created by wind and wave action following the melting of large glaciers about 8,000–10,000 years ago. Soils are sand and silt. Local relief exceeds 80 feet in some places.

**scoping**—Process of obtaining information from the public for input into the planning process.

**sediment**—Material deposited by water, wind, and glaciers.

**Service**—See U.S. Fish and Wildlife Service.

**shelterbelt**—Single to multiple rows of trees and shrubs planted around cropland or buildings to block or slow down the wind.

**shorebird**—Any of a suborder of birds such as a plover or a snipe that frequent the seashore or mud flat areas.

**sound professional judgment**—Finding, determination, or decision that is consistent with principles of sound fish and wildlife management and administration, available science and resources, and adherence to the requirements of the National Wildlife Refuge System Administration Act and other applicable laws.

**spatial**—Relating to, occupying, or having the character of space.

**special status species**—Plants or animals that have been identified through Federal law, State law, or agency policy as requiring special protection of monitoring. Examples include federally listed endangered, threatened, proposed, or candidate species; State-listed endangered, threatened, candidate, or monitor species; the Service’s species of management concern; and species identified by the Partners in Flight program as being of extreme or moderately high conservation concern.

**special use permit**—Permit for special authorization from the refuge manager required for any refuge service, facility, privilege, or product of the soil provided at refuge expense and not usually available to the general public through authorizations in Title 50 CFR or other public regulations (“National Wildlife Refuge System Manual” 5 RM 17.6).

**species of concern**—Those plant and animal species, while not falling under the definition of special status species, that are of management interest by virtue of being Federal trust species such as migratory birds, important game species, or significant keystone species; species that have documented or apparent populations declines, small or restricted populations, or dependence on restricted or vulnerable habitats. Species that: (1) are documented or have apparent population declines; (2) are small or restricted populations; or (3) depend on restricted or vulnerable habitats.

**stand**—Any homogenous area of vegetation with more or less uniform soils, landform, and vegetation. Typically used to refer to forested areas.

**step-down management plan**—Plan that provides the details necessary to carry out management strategies identified in the comprehensive conservation plan (“Draft U.S. Fish and Wildlife Service Manual” 602 FW 1.5).

**strategy**—Specific action, tool, or technique or combination of actions, tools, and techniques used to meet unit objectives (“Draft U.S. Fish and Wildlife Service Manual” 602 FW 1.5).

- submergent**—Vascular or nonvascular hydrophyte, either rooted or nonrooted, that lies entirely beneath the water surface, except for flowering parts in some species.
- succession**—Orderly progression of an area through time from one vegetative community to another in the absence of disturbance. For example, an area may proceed from grass-forb through aspen forest to mixed-conifer forest.
- surficial**—Relating to or occurring on the surface.
- temporarily flooded**—Surface water is present for brief periods during the growing season.
- trust resource**—Resource that, through law or administrative act, is held in trust for the people by the government. A Federal trust resource is one for which trust responsibility is given in part to the Federal Government through Federal legislation or administrative act. Generally, Federal trust resources are those considered to be of national or international importance no matter where they occur, such as endangered species and species such as migratory birds and fish that regularly move across statelines. In addition to species, trust resources include cultural resources protected through Federal historic preservation laws, nationally important and threatened habitats, notably wetlands, navigable waters, and public lands such as State parks and national wildlife refuges.
- trust species**—See trust resource.
- understory**—Any vegetation whose canopy (foliage) is below, or closer to the ground than canopies of other plants.
- upland**—Dry ground; other than wetlands.
- USDA**—U.S. Department of Agriculture.
- U.S. Fish and Wildlife Service (Service, USFWS)**—Principal Federal agency responsible for conserving, protecting, and enhancing fish and wildlife and their habitats for the continuing benefit of the American people. The Service manages the 93-million-acre National Wildlife Refuge System composed of more than 530 national wildlife refuges and thousands of waterfowl production areas. It also operates 65 national fish hatcheries and 78 ecological service field stations, the agency enforces Federal wildlife laws, manages migratory bird populations, restores national significant fisheries, conserves and restores wildlife habitat such as wetlands, administers the Endangered Species Act, and helps foreign governments with their conservation efforts. It also oversees the Federal aid program that distributes millions of dollars in excise taxes on fishing and hunting equipment to State wildlife agencies.
- U.S. Fish and Wildlife Service mission**—The mission of the U.S. Fish and Wildlife Service is working with others to conserve, protect, and enhance fish, wildlife, and plants and their habitats for the continuing benefit of the American people.
- USFWS**—See U.S. Fish and Wildlife Service.
- U.S. Geological Survey (USGS)**—Federal agency whose mission is to provide reliable scientific information to describe and understand the earth; minimize loss of life and property from natural disasters; manage water, biological, energy, and mineral resources; and enhance and protect our quality of life.
- USGS**—See U.S. Geological Survey.
- vision statement**—Concise statement of what the planning unit should be, or what the Service hopes to do, based primarily on the Refuge System mission, specific refuge purposes, and other mandates. In addition, the vision statement is tied to the maintenance and restoration of biological integrity, diversity, and environmental health of each refuge and the Refuge System.
- visual obstruction**—Pertaining to the density of a plant community; the height of vegetation that blocks the view of predators and conspecifics to a nest.
- visual obstruction reading (VOR)**—Measurement of the density of a plant community; the height of vegetation that blocks the view of predators to a nest.
- VOR**—See visual obstruction reading.
- wading birds**—Birds having long legs that enable them to wade in shallow water. Includes egrets, great blue herons, black-crowned night-herons, and bitterns.
- warm-season grass**—Grass that begins growth later in the season (early June); require warmer soil temperatures to germinate and actively grow when temperatures are warmer (85–95°F). Examples are Indiangrass, switchgrass, and big bluestem.
- waterfowl**—Category of birds that includes ducks, geese, and swans.
- watershed**—Geographic area within which water drains into a particular river, stream or body of water. A watershed includes both the land and the body of water into which the land drains.
- wetland**—Land transitional between terrestrial and aquatic systems where the water table is usually at or near the surface or the land is covered by shallow water.
- wetland easement**—Perpetual agreement entered into by a landowner and the Service. The easement covers only the wetlands specified in the agreement. In return for a single lump-sum payment, the landowner agrees not to drain, burn, level, or fill wetlands covered by the easement.
- wetland management district (WMD)**—Land that the Refuge System acquires with Federal Duck Stamp funds for restoration and management primarily as prairie wetland habitat critical to waterfowl and other wetland birds.
- wilderness**—“A wilderness, in contrast with those areas where man and his own works dominate the landscape, is hereby recognized as an area where the earth and its community of life are untrammelled

by man, where man himself is a visitor who does not remain” (Wilderness Act of 1964 Section 2c [P.L. 88-577]). This legal definition places wilderness in the “untrammled” or “primeval” end of the environmental modification spectrum. Wilderness is roadless lands, legally classified as component areas of the National Wilderness Preservation System, and managed to protect its qualities of naturalness, solitude, and opportunity for primitive types of recreation. 5,000 contiguous roadless acres or is sufficient in size as to make practicable its preservation and use in an unimpaired condition (“Draft U.S. Fish and Wildlife Service Manual” 610 FW 1.5).

**wildfire**—Free-burning fire requiring a suppression response; all fire other than prescribed fire that occurs in wildlands (“U.S. Fish and Wildlife Service Manual” 621 FW 1.7).

**wildland fire**—Every wildland fire is either a wildfire or a prescribed fire (“U.S. Fish and Wildlife Service Manual” 621 FW 1.3).

**wildlife-dependent recreational use**—Use of a refuge involving hunting, fishing, wildlife observation and photography, or environmental education and interpretation. These are the six priority public uses of the Refuge System as established in the National Wildlife Refuge System Administration Act, as amended. Wildlife-dependent recreational uses, other than the six priority public uses, are those that depend on the presence of wildlife.

**wildlife management**—Practice of manipulating wildlife populations either directly through regulating the numbers, ages, and sex ratios harvested, or indirectly by providing favorable habitat conditions and alleviating limiting factors.

**WMD**—See wetland management district.

**woodland**—Open stands of trees with crowns not usually touching, generally forming 25–60 percent cover.

**xerophytic**—Pertaining to a plant that needs very little water (adapted to growing in dry habitat).

# Appendix A

## *Compatibility Determinations*

### **A.1 Compatibility Determination for Wildlife Observation and Wildlife Photography**

#### **USES**

Wildlife observation and wildlife photography.

#### **DISTRICT NAMES**

- Huron WMD
- Madison WMD
- Sand Lake WMD

#### **COUNTIES**

Beadle, Brookings, Brown, Buffalo, Campbell, Corson, Deuel, Dewey, Edmunds, Faulk, Hamlin, Hand, Hughes, Hyde, Jerauld, Kingsbury, Lake, Miner, McCook, McPherson, Minnehaha, Moody, Potter, Sanborn, Spink, and Sully, South Dakota

#### **ESTABLISHING AND ACQUISITION AUTHORITIES**

- Migratory Bird Conservation Act
- Executive Order 5782

#### **WETLAND MANAGEMENT DISTRICT PURPOSES**

The districts were created to administer the Small Wetlands Acquisition Program to save wetlands from various threats—particularly drainage. The main authorities in establishment of the program are briefly discussed below:

- *Migratory Bird Hunting and Conservation Stamp Act (16 U.S.C. 718d[c])*—“as waterfowl production areas subject to all provisions of the Migratory Bird Conservation Act ... except the inviolate sanctuary provisions.” The Duck Stamp Act provides for the conservation, protection, and propagation of native species of fish and wildlife, including migratory birds that are threatened with extinction.
- *Migratory Bird Conservation Act (16 U.S.C. 715d[2])*—“for any other management purposes, for migratory birds.” This act addresses the obligations of the United States under the Migratory Bird Treaty Act through the following mechanisms:

- lessening the dangers threatening migratory game birds from drainage and other causes
- the acquisition of areas of land and water to furnish in perpetuity reservations for the adequate protection of such birds
- authorizing appropriations for the establishment of such areas, their maintenance and improvement, and for other purposes

The purpose of the districts is “to assure the long-term viability of the breeding waterfowl population and production through the acquisition and management of waterfowl production areas, while considering the needs of other migratory birds, threatened and endangered species, and other wildlife” (memorandum from Region 6 Assistant Regional Director Richard A. Coleman, December 2006). This purpose statement was developed for all Region 6 wetland management districts. Because the purposes and management capabilities and challenges are similar for the three districts, the Service has elected to address them collectively in this draft CCP and EA.

#### **NATIONAL WILDLIFE REFUGE SYSTEM MISSION**

*The mission of the System is to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans.*

#### **DESCRIPTION OF USES**

This use would provide opportunities that support wildlife-dependent recreation. Wildlife observation and wildlife photography would be allowed year-round.

This CCP proposes to continue the above uses and add the following to improve wildlife observation and wildlife photography: update and improve district signs and update existing brochures to the Service’s graphic standards.

The districts would be open for wildlife observation and wildlife photography. Their supporting use (access) would be controlled and regulated through the publication of refuge tear sheets and brochures and through information posted at the kiosks.

Wildlife observation and wildlife photography are two of the six wildlife-dependent, priority public uses

specified in the Improvement Act. These uses and their supporting access-related uses can be allowed at the districts without interfering with the migratory bird resource.

**AVAILABILITY OF RESOURCES**

Currently, the programs for wildlife observation and wildlife photography are administered using available resources. Implementation of new programs, activities, and facilities outlined in this CCP is tied to funding requests in the form of Refuge Operating Needs System and Service Asset Maintenance Management System projects.

**ANTICIPATED IMPACTS OF THE USES**

**Short-Term Impacts.** Temporary disturbance may exist to wildlife near the activity. Direct, short-term impacts may include minor damage from traffic to district roads and trails when wet and muddy, minor damage to vegetation, littering, increased maintenance activity, and potential conflicts with other visitors. These activities would have only minor impacts on wildlife and would not detract from the primary purposes of the districts.

**Long-Term Impacts.** None.

**Cumulative Impacts.** There would be no direct or indirect cumulative impacts anticipated with these uses.

**PUBLIC REVIEW AND COMMENT**

This compatibility determination was prepared concurrently with the draft CCP and EA for the districts. Public review and comment will be achieved concurrently with the public review and comment period for the draft CCP and EA.

**DETERMINATION**

Wildlife observation and wildlife photography, along with their supporting uses, are compatible uses at Huron WMD, Madison WMD, and Sand Lake WMD.

**STIPULATIONS NECESSARY TO ENSURE COMPATIBILITY**

Stipulations regarding the public use program would be made available in published district brochures. Dates, closed areas, and other information would be specified. Each district would restrict vehicles to designated roads and trails, monitor vehicle use for wildlife disturbance and law enforcement violations, and so forth. It would also monitor use, regulate access, and maintain necessary facilities to prevent habitat degradation and minimize wildlife disturbance.

**JUSTIFICATION**

Based on the anticipated biological impacts above and in the EA, wildlife observation and wildlife photography on the Huron WMD, Madison WMD, and Sand Lake WMD would not interfere with the habitat goals

and objectives or purposes for which these wetland management districts were established.

Wildlife observation and wildlife photography are priority wildlife-dependent public uses acknowledged in the Improvement Act. These uses promote an appreciation for the natural resources at the refuge. Increased public stewardship will support and complement the Service’s actions in achieving the purposes of the wetland management districts and the mission of the Refuge System.

**Submitted**

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Harris Hoistad Project Leader, Sand Lake National Wildlife Refuge Complex USFWS, Region 6	Date
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Clarke Dirks Project Leader, Huron WMD USFWS, Region 6	Date
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Thomas Tornow Project Leader, Madison WMD USFWS, Region 6	Date
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**Review**

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Paul Cornes Refuge Supervisor USFWS, Region 6	Date
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**Approval**

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Richard A. Coleman, Ph.D. Assistant Regional Director National Wildlife Refuge System USFWS, Region 6	Date
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**MANDATORY 15-YEAR REEVALUATION DATE: 2026**

## A.2 Compatibility Determination for Waterlines on Grassland Easements to Provide Livestock Watering

### Use

Waterlines on grassland easements to provide livestock watering.

### DISTRICT NAMES

- Arrowwood WMD
- Audubon WMD
- Chase Lake WMD
- Crosby WMD
- Devils Lake WMD
- Huron WMD
- J. Clark Salyer WMD
- Kulm WMD
- Lake Andes WMD
- Long Lake WMD
- Lostwood WMD
- Madison WMD
- Sand Lake WMD
- Tewaukon WMD
- Valley City WMD
- Waubay WMD

### COUNTIES

All counties within the districts.

### ESTABLISHING AND ACQUISITION AUTHORITIES

- Consolidated Farm and Rural Development Act
- Migratory Bird Conservation Act
- Migratory Bird Hunting and Conservation Stamp Tax
- North American Wetlands Conservation Act
- Emergency Wetlands Resources Act

### DISTRICT PURPOSES

“...as Waterfowl Production Areas” subject to” ...all of the provisions of such Act [Migratory Bird Conservation Act] ...except the inviolate sanctuary provisions...” 16 U.S.C. 718(c) (*Migratory Bird Hunting and Conservation Stamp*)

“...for any other management purpose, for migratory birds.” 16 U.S.C. 715d (*Migratory Bird Conservation Act*)

“...for conservation purposes ...” 7 U.S.C. 2002 (*Consolidated Farm and Rural Development Act*)

### NATIONAL WILDLIFE REFUGE SYSTEM MISSION

*The mission of the System is to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans.*

### DESCRIPTION OF USE

**What is the use? Is the use a wildlife-dependent public use?** The activity requested involves burying waterlines to provide for livestock watering on areas encumbered by Service grassland easements in North and South Dakota. The buried waterline is a new use of the grassland easement because of the surface grass disturbance that would be considered an economic use. There are approximately 2,500 individual grassland contract holders in the two States. It is estimated that no more than 10 percent or 250 will ever make a request for a buried waterline. In those cases where additional water supplies are provided, there is a better distribution of grazing on the easement tract, and overall health and sustainability of the grass is improved. The waterlines are installed with either a chisel plow or narrow trenching (not exceeding 2 feet) equipment to a depth of 6–8 feet. Minor and very temporary disturbance to the grass is confined to an area no greater than 10 feet on either side of the pipe location. The waterlines are polyethylene pipe of approximately 2 inches in diameter. The disturbance to grass is minimal (generally not exceeding 1 acre of disturbance) in relation to the acreage involved in the easement tract (average 600 acres). The disturbance caused by the trench is immediately restored and with residual and seeded grasses, the activity disturbance is temporary, and within 1–2 years little to no evidence remains of the activity. The activity will be permitted with a SUP and stipulations provided to ensure special and limiting conditions are adhered to and restoration is complete. The waterline will deliver water to a holding tank and gravel pad causing permanent disturbance to grass on an area of approximately 60 feet by 60 feet, representing less than one-tenth of one acre or less than 0.00001 percent of the average grassland easement tract.

**Where would the use be conducted?** The use will be conducted on grassland easements in all the wetland management districts listed. Generally the grassland easement tracts are native grassland areas that are used predominately for cattle grazing. There will be minimal or nondetected disturbance to wildlife as a result of the activity and what does occur will be very temporary. The disturbance to the average grassland easement tract will represent less than 0.002 percent of the average easement tract.

**When would the use be conducted?** The use will be conducted as a one time event in the summer season when frost no longer exists and conditions have dried sufficiently to minimize grass disturbance. There is little to no future maintenance.

**How would the use be conducted?** The activity will be conducted with either trenching equipment (such as a backhoe) or a chisel plow. Disturbance will not exceed 2 feet in width, and it would be less if the chisel plow is used.

**Why is this use being proposed?** The grassland easement holder will request the use. The request will be made to provide better water availability for improved grass utilization due to more equal grazing distribution. Buried waterlines for livestock watering is a cost-effective and reliable alternative to traditional stock watering dams, especially in times of drought or low precipitation conditions.

### AVAILABILITY OF RESOURCES

**Resource involved in the administration and management of the use.** No additional management or administrative costs will be associated with this activity.

**Special equipment, facilities, or improvements necessary to support the use:** None

**Maintenance costs:** None

**Monitoring costs:** None

**Offsetting revenues:** None

### ANTICIPATED IMPACTS OF THE USE

**Short-Term Impacts.** There will be only temporary disturbance to the grass from the construction activities, so all impacts will be short-term. In 1–2 years, little to no evidence exists of the activity. There will be no indirect impacts associated with this activity.

**Long-Term Impacts.** There will be no long-term impacts associated with this activity.

**Cumulative Impacts.** The only cumulative direct impact will be the loss of grassland from the installation of water holding facilities, estimated to be approximately 360 square feet, representing 0.008 of an acre or 0.00001 percent of the average grassland easement (600 acres). There are no indirect impacts from the proposed activity.

### PUBLIC REVIEW AND COMMENT

The period of public review and comment began August 9, 2004 and ended August 13, 2004.

The following methods were used to solicit public review and comment: posted notices in public places

**Why was this level of public review and comment selected?** The proposed activity is considered minor, incidental, one-time with minimal temporary disturbance.

**Summarize comments received and any actions taken or not taken because of comments received.** No comments were received.

### DETERMINATION

Use is compatible with the following stipulations.

### STIPULATIONS NECESSARY TO ENSURE COMPATIBILITY

1. Soil, if removed through trenching, will be replaced in the same soil profile as it was removed. Topsoil will be replaced and all soils compacted.
2. Activity will occur during the time when soils are dry and equipment activity will have reduced impact to grasses and soils.
3. Any areas that are disturbed will be reseeded to the appropriate grass mixture if determined necessary for reestablishment by the refuge manager.

### JUSTIFICATION

There will be minimal and temporary disturbance to the grassland resources protected by the Service's easement by this activity. The use will not detract from or materially interfere with the mission or purpose of the Refuge System. It is an economic use and as such the activity will benefit the Service mission and purpose through better management of the grassland community by providing improved grazing distribution.

**If the proposed use is an economic use of refuge natural resources, how would it contribute to the purposes of the refuge or the mission of the Refuge System?** The activity of providing water for livestock grazing will contribute to the mission by providing improved grazing distribution and better range management of the grassland resources protected by the Service's easement.

### TEXT OF PUBLIC NOTICE

The U.S. Fish and Wildlife Service (Service) is soliciting public comments on whether to allow buried waterlines to provide for livestock watering on Service Grassland Easements in North and South Dakota. The activity will cause minor and temporary disturbance to the grassland area. Restoration will be ensured through stipulations defined in a Special Use Permit agreed to by the landowner. Through better distribution of livestock grazing the health and sustainability to the grasslands will be better ensured. People wishing to provide comments can do so by August 13th by submitting them to the Wetland Habitat Office, 3425 Miriam Avenue, Bismarck, ND 58501. For more information contact Lloyd Jones at (701) 355-8529.

**Submitted**

Kim Hanson Arrowwood WMD	Date	Mike Bryant Lake Andes WMD	Date
Mike McEnroe Audubon WMD	Date	Paul VanNingen Long Lake WMD	Date
Mick Erickson Chase Lake WMD	Date	Todd Frerichs Lostwood WMD	Date
Tim Kessler Crosby WMD	Date	Thomas Turnow Madison WMD	Date
Roger Hollevoet Devils Lake WMD	Date	Gene Williams Sand Lake WMD	Date
Harris Hoistad Huron WMD	Date	Jack Lalor Tewaukon WMD	Date
Lee Albright J. Clark Salyer WMD	Date	Cory Richardson Valley City WMD	Date
Bob Vanden Berge Kulm WMD	Date	Larry Martin Waubay WMD	Date

**Review**

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Lloyd Jones  
Regional Compatibility Coordinator

Date

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Paul Cornes  
Refuge Supervisor  
USFWS, Region 6

Date

**Approval**

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Richard A. Coleman, Ph.D.  
Assistant Regional Director  
National Wildlife Refuge System  
USFWS, Region 6

Date

**MANDATORY 10- OR 15-YEAR REEVALUATION  
DATE: 2019**

## A.3 Compatibility Determination for Authorized Health and Safety Requests Associated with Service Wetland Easements Resulting in Only Minor Impacts to the Easement Interest

### USE

Requests to resolve a health and safety issue that cannot be resolved by temporary authorization, and which results in only a minor impact to the Service's wetland easement interest. The use, if authorized, will result in non-material impacts to protected wetlands involving partial drainage and/or filling, both of which are acquired interests in the easement wetland.

### STATION NAMES

#### South Dakota Wetland Management Districts and National Wildlife Refuge

- Lake Andes WMD
- Madison WMD
- Huron WMD
- Waubay WMD
- Sand Lake WMD
- Lacreek National Wildlife Refuge

#### North Dakota Wetland Management Districts

- Tewaukon WMD
- Kulm WMD
- Arrowwood WMD
- Valley City WMD
- Chase Lake WMD
- Audubon WMD
- Long Lake WMD
- J. Clark Salyer WMD
- Devils Lake WMD
- Lostwood WMD
- Crosby WMD

#### Montana Wetland Management Districts

- Northeast Montana WMD
- Bowdoin WMD
- Benton Lake WMD

- Northwest Montana WMD
- Charles M. Russell WMD

### ESTABLISHING AND ACQUISITION AUTHORITIES

#### Waterfowl Production Areas, Wetland Easements, Grassland Easements

The Migratory Bird Hunting and Conservation Stamp Act, March 16, 1934, (*16 U.S.C. Sec. 718-718h, 48 Stat. 452*) as amended August 1, 1958, (*P.L. 85-585; 72 Stat. 486*) for acquisition of "Waterfowl Production Areas"

The Wetlands Loan Act, October 4, 1961, as amended (*16 U.S.C. 715k-3 - 715k-5, Stat. 813*), funds appropriated under the Wetlands Loan Act are merged with duck stamp receipts in the fund and appropriated to the Secretary for the acquisition of migratory bird refuges under the provisions of the Migratory Bird Conservation Act, February 18, 1929, (*16 U.S.C. Sec. 715, 715d - 715r, as amended*)

#### FmHA deed restricted properties

Consolidated Farm and Rural Development Act (*7 U.S.C. Para. 2002*)

#### Tallgrass Prairie Tracts

Land and Water Conservation Fund Act of 1965, as amended (*16 U.S.C. 460l-4 through 460l-11*)

### DISTRICT AND REFUGE PURPOSES

"...as Waterfowl Production Areas" subject to "...all of the provisions of such Act [Migratory Bird Conservation Act] ...except the inviolate sanctuary provisions..." *16 U.S.C. 718(c) (Migratory Bird Hunting and Conservation Stamp)*

"...for any other management purpose, for migratory birds." *16 U.S.C. 715d (Migratory Bird Conservation Act)*

"...for conservation purposes..." *7 U.S.C. 2002 (Consolidated Farm and Rural Development Act)*

### NATIONAL WILDLIFE REFUGE SYSTEM MISSION

*The Mission of the National Wildlife Refuge System is to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans.*

### DESCRIPTION OF USE

Wetland management districts frequently receive requests for use or modification of wetlands protected by easement which may affect the Service interest acquired in private property. The uses authorized under

this compatibility determination are related to actions necessary to avert or resolve a health and safety issue involving a Service-protected wetland. Requests may be received by wetland management districts primarily from private property owners who are experiencing difficulties associated with easement-protected wetlands. The Service has wetland easements in every county within the Prairie Pothole Region in the States of North Dakota, South Dakota, and Montana.

Examples of the kinds of requests anticipated under this category include: (1) the possible need to establish a sill elevation on a wetland to lower it slightly to avoid flooding a domestic sanitary system, building, basement, or existing private road; (2) the need to place fill material in a protected wetland to widen a driveway or farm approach to more safely transport equipment and/or loaded grain trucks; or (3) the need to protect a foundation or footing for existing building or grain bins. Lowering a wetland or adding fill to a wetland to remove water from cropland or hayland is not included in this compatibility determination.

All requested uses under this category will be evaluated using the right side of the Easement Permit Flowchart (Health and Safety) to evaluate the requested activity. If the proposal passes through the flowchart as a legitimate health and safety issue, then it becomes a request that the Service will try to honor as a necessary resolution to a hardship which may be caused by the easement wetland.

At times, the requested use may impact Service easement interests. Managers will always try to resolve the issue or situation with temporary measures, meaning that the impact on Service interests will be only a temporary disturbance. If temporary relief measures will not resolve the issue, then a more permanent impact on Service lands or interests will likely result.

Region 6 has defined a “threshold” level of impact that may occur as a result of permitting the requested use but will not materially interfere with, nor detract from, the purposes for which the easement interest was acquired. These levels of impact are defined more fully in the “Justification” section of this compatibility determination, and are based on years of scientific evaluation of prairie pothole-type habitat and how habitat impacts affect migratory bird populations. These threshold levels of potential impact for protected wetlands have been established at 0.4 acres of wetland, not to exceed 25 percent of the wetland basin. These levels have been established based on biological models developed by HAPET in Bismarck, North Dakota.

Threshold levels are not used in conjunction with highway improvement projects or any other activity evaluated by the left side of the flowchart (Public Service, Government or Corporate), so impacts which may result from this category of request will not be evaluated under this compatibility determination.

For this compatibility determination to be used, the use must: (1) be an action necessary to avert a threat to human health and safety or a major threat to public or private property not related to a public service or government-type request, and (2) result in an impact which is at or below the established threshold levels for protected wetlands habitats (see discussion in “Anticipated Impacts of the Use” and “Justification” sections below).

## **AVAILABILITY OF RESOURCES**

Financial and staff resources are sufficient at each field station to administer these requests. Staff time will be needed to evaluate the proposed use, to prepare the site-specific permits, and to ensure compliance with the permit authorization and stipulations, as well as checking for satisfactory restoration of any disturbed sites as necessary.

No specialized equipment will be necessary, as the work requirement associated with these projects is monitoring and compliance checking only. Actual work, including restoration needs if applicable, will be completed by the applicant.

## **ANTICIPATED IMPACTS OF THE USE**

Most of the impacts will result from filling or partially draining parts of protected wetlands, the right to “fill” wetland areas protected by the easement being one of the acquired rights. Partial drainage, another acquired right, may also be authorized to resolve certain health and safety issues, if they cannot be resolved by temporary means.

If the only way to resolve the health and safety issue is to permit a portion of the wetland to be either filled or by lowering the wetland elevation by establishing an overflow sill, then there will be a long-term impact on the wetland. However, the impact would be determined to be below a “material” impact or interference with the purposes of the unit or the mission of the Refuge System as described in “Justification.” These impacts are considered minor with respect to the entire scope of the small wetlands program within the Prairie Pothole Region of Region 6.

Within this compatibility determination, there are no secondary impacts, or at least none which cannot be resolved with stipulations. No complete wetlands are drained or filled (the 25 percent condition), so although potentially reduced in size by 25 percent, or by up to 0.4 acres, the wetland still exists as the same type wetland that originally existed. If the potentially affected wetland contains a colonial bird nesting site or some unique feature, the use may not be allowed, or it may be allowed with stipulations that would eliminate the secondary or indirect impact.

The Region 6 States of North Dakota, South Dakota, and Montana have over 15,000 wetland easement contracts comprising over 1.2 million acres of wetlands. It

is anticipated that between 5 and 10 requests annually may be received to allow partial drainage or filling of protected wetlands. Cumulative impacts under this scenario may include up to 4 acres of impact annually out of 1.2 million acres of protected wetlands.

If multiple requests are received from the same landowner, each request will be evaluated on its own merit. Each easement contract may be authorized up to one threshold level of impact in total, whether it occurs all at one time, or in different authorizations. Therefore, only up to 0.4 acres of potential wetland impact may be authorized for each easement contract for resolution of legitimate health and safety issues, or for other authorized uses.

## PUBLIC REVIEW AND COMMENT

The period of public review and comment began \_\_\_\_\_ and ended \_\_\_\_\_.

Posted notices were made in public places for each of the field stations listed on this compatibility determination.

## DETERMINATION

**Compatibility Threshold.** Material interference or detracting from the purposes and/or mission of the Refuge System.

Authorized health and safety requests associated with Service wetland easements resulting in only minor impacts to the easement interest are compatible uses at Lake Andes WMD, Madison WMD, Huron WMD, Waubay WMD, Sand Lake WMD, Lacreek National Wildlife Refuge, Tewaukon WMD, Kulm WMD, Arrowwood WMD, Valley City WMD, Chase Lake WMD, Audubon WMD, Long Lake WMD, J. Clark Salyer WMD, Devils Lake WMD, Lostwood WMD, Crosby WMD, Northeast Montana WMD, Bowdoin WMD, Benton Lake WMD, Northwest Montana WMD, and Charles M. Russell WMD.

## STIPULATIONS NECESSARY TO ENSURE COMPATIBILITY

1. Issuance of a permit does not preclude the requirements for obtaining necessary permits and/or approvals from other county, State, or Federal agencies and from local landowners.
2. The permit is issued subject to the revocation and appeals procedure contained in Title 50, Part 25 of the CFR.
3. Regardless of the authorized threshold level, the permit will require the least amount of impact on the Service easement interest as is necessary to resolve the health and safety issue.
4. If the requested use passes the flowchart and is authorized, and results in minor impacts which are more than temporary, then the use will be subject to the terms and conditions of the easement permit.

5. If past authorizations for any reason have been granted for this easement, then the manager cannot authorize any use that will exceed the aggregate total authorization of 0.4 acres of wetland impact, including the past authorizations.
6. Site-specific stipulations may be added to the permit to address resolution of any potential secondary impacts.

## JUSTIFICATION

The administration of the Service easement program in Region 6 requires managers to make decisions regarding requested uses of private lands encumbered by Service easement interests. Managers will use the Easement Permit Request Flowchart to determine if the requested use should be authorized. If the requested use is authorized, then this compatibility determination will be used for the requests that have passed through the evaluation process and that fall within the established levels of impact authorized for easement wetlands to approve means to resolve legitimate health and safety issues. It is anticipated that no more than 5–10 authorizations will be granted each year for the entire Prairie Pothole Region portion of Region 6 (North Dakota, South Dakota, Montana) that would require the use of this compatibility determination. Once again, the compatibility determination will only be used if temporary means cannot be used to resolve the issue.

Data provided by HAPET have been used to predict the effect to waterfowl resources resulting from impacts to wetlands. When these habitat impacts occur on lands protected by Service easements, then a determination must be made as to whether these impacts represent a material interference or detracting from the purposes for which the easement area was established or from the mission of the Refuge System.

With the HAPET information about how waterfowl populations respond to habitat changes within the Prairie Pothole Region, managers may now use applied science and compelling data to quantify impacts resulting from wetland-altering activities—whereas before, they were using only a judgment. The level of wetland impact which corresponds with a “non-material” impact (as portrayed under compatibility standards) is defined as one pair of ducks, the lowest whole unit and functional common denominator.

The impacts of wetland loss on breeding duck pairs (that is, mallard, northern pintail, gadwall, blue-winged teal, and northern shoveler, which together compose approximately 90 percent of the breeding ducks in North and South Dakota) were evaluated using models developed with data collected by the Service during the annual Four Square Mile Breeding Waterfowl Population Survey. HAPET applied the models to all wetlands mapped by the National Wetland Inventory to predict the average number of

breeding duck pairs attracted to each wetland for 13 years (1987–1999) of the Four Square Mile Breeding Waterfowl Population Survey. Results indicate that temporary and seasonal wetlands, on average, attract about one duck pair per acre; while semipermanent wetlands attract about one pair for every 1.5 wetland acres. While the average breeding pair densities are as identified above, the highest density occurring on a single wetland district for a single class of wetlands was 1.98 pairs per acre or one pair for 0.5 acres (Sand Lake–temporary wetlands). These estimates can be used as a foundation for identifying non-material levels of impact on wetlands. Wetland impacts that result in affecting less than one pair of breeding ducks is below a “material” impact relative to compatibility.

Even though the overall average for all classes of wetlands for all wetland management districts is approximately one pair of ducks for each wetland acre, and the highest density encountered is one pair per 0.5 acres, this proposal is to ensure that any authorized use resulting in a wetland impact will not result in the loss of one whole pair of ducks on the landscape, regardless of where it is within the Region 6 Prairie Pothole Region, and which class of wetland is affected. Therefore, the proposal to use 0.4 acres as the upper limit of impact to achieve compatibility inherently builds in an additional 20 percent margin of safety.

In addition, it is further determined that impacts must be less than 25 percent of the affected basin to be within these threshold criteria. This recommendation, combined with the wetland and duck pair relationship information provided by HAPET and outlined above, suggests that a wetland impact of 0.4 acres or less, and not including more than 25 percent of the wetland basin, will not materially interfere with nor detract from the purposes for which the wetland easement was acquired, nor will it detract from the mission of the Refuge System.

The not-to-exceed threshold levels of impact to easement-protected wetlands which are necessary to ensure compatibility are 0.4 acres or less, and not over 25 percent of the wetland basin. These levels were selected because of the following: (1) they result in built-in margins of safety (80 percent) from the actual figures determined by HAPET; (2) the represented levels are based on the best available science, the pair-wetland relationship model developed by HAPET and the Mallard Model, as well as many years of collected data from nearly the entire Prairie Pothole Region within Region 6; the threshold levels of impact represent a biologically meaningful measure (that is, one pair of ducks); the levels establish a consistent, science-based method for managers to use when evaluating compatibility of proposed uses for less than fee-title land interests.

## Submitted

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Michael Bryant, Project Leader Lake Andes WMD	Date
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Tom Tornow, Project Leader Madison WMD	Date
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Clarke Dirks, Project Leader Huron WMD	Date
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Larry Martin, Project Leader Waubay WMD	Date
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Harris Hoistad, Project Leader Sand Lake WMD	Date
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Brian DeVries, Project Leader Lacreek National Wildlife Refuge	Date
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Rob Bundy, Acting Project Leader Tewaukon WMD	Date
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Mike Erickson, Project Leader Kulm WMD	Date
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Kim D. Hanson, Project Leader                      Date  
 Arrowwood WMD  
 Chase Lake WMD  
 Valley City WMD

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Kathy Burchett, Project Leader                      Date  
 Benton Lake WMD

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Lloyd Jones, Project Leader                      Date  
 Audubon WMD

---

Jeff King, Project Leader                      Date  
 Northwest Montana WMD

---

Paul Van Ningen, Project Leader                      Date  
 Long Lake WMD

---

Kathy Burchett, Project Leader                      Date  
 Northwest Montana Flathead County WMD

---

Kelly Hogan, Project Leader                      Date  
 J. Clark Salyer WMD

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Rick Potts, Project Leader                      Date  
 Charles M. Russell WMD

## Review

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Roger Hollevoet, Project Leader                      Date  
 Devils Lake WMD

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Lloyd Jones    Date  
 Regional Compatibility Coordinator

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Dave Gillund, Project Leader                      Date  
 Lostwood WMD  
 Crosby WMD

---

Paul Cornes    Date  
 Refuge Supervisor  
 USFWS, Region 6

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Jerry Rodriguez, Project Leader                      Date  
 Northeast Montana WMD

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Dean Rundle    Date  
 Refuge Supervisor  
 USFWS, Region 6

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Carmen Luna, Project Leader                      Date  
 Bowdoin WMD

## Approval

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Richard A. Coleman, Ph.D.  
Assistant Regional Director  
National Wildlife Refuge System  
USFWS, Region 6

Date

### **MANDATORY 10-YEAR REEVALUATION DATE**

10 years from the date of approval signature.

Enter Reevaluation Date: \_\_\_\_\_

## A.4 Compatibility Determination for Glyphosate-Tolerant Soybeans and Corn for Habitat Restoration and Management on National Wildlife Refuge System (System) Owned or Managed Lands in Region 6

### USE

Use of glyphosate-tolerant soybeans and corn for habitat restoration and management on National Wildlife Refuge System (System) owned or managed lands in Region 6.

### REFUGE NAME

- Arrowwood Complex
- Audubon Complex
- Devils Lake Complex
- Flint Hills National Wildlife Refuge
- Huron Wetland Management District
- Kirwin National Wildlife Refuge
- Kulm Wetland Management District
- Lake Andes Complex
- Long Lake Complex
- Madison Wetland Management District
- Marais des Cygnes National Wildlife Refuge
- Quivira National Wildlife Refuge
- Rainwater Basin Wetland Management District
- Souris River Basin Complex
- Sand Lake Complex
- Tewaukon Complex
- Waubay Complex

### COUNTIES

All counties within national wildlife refuges and wetland management districts listed above in Region 6.

### ESTABLISHING AND ACQUISITION AUTHORITIES

System lands are managed consistent with a number of federal statutes, regulations, policies, and other guidance. The National Wildlife Refuge System Administration Act of 1966, as amended (16 United States

Code [U.S.C.] 668dd–668ee) (Administration Act) is the core statute guiding management of the System.

The National Wildlife Refuge System Improvement Act of 1997 (Public Law [P.L.] 105-57) made important amendments to the Administration Act, one of which was the mandate that a comprehensive conservation plan be completed for every unit of the System. Among other things, comprehensive conservation planning has required field stations to assess their current farming program and establish objectives for the future.

The Migratory Bird Hunting Stamp Act of March 16, 1934, as amended by section 3 of the Act of August 1, 1958 (72 Stat. 486, 16 U.S.C. sec. 716 d[c]), authorized the Secretary of Interior to acquire small wetland or pothole areas suitable as Waterfowl Production Areas.

Additional Authorities include the following: Consolidated Farm and Rural Development Act, Migratory Bird Conservation Act, North American Wetlands Conservation Act, and the Emergency Wetlands Resources Act.

### REFUGE PURPOSES

- As “a refuge and breeding ground for migratory birds and other wildlife, for use as an inviolate sanctuary, or for any other management purpose for migratory birds.” *Migratory Bird Conservation Act*
- As “Waterfowl Production Areas” subject to “[...] all of the provisions of such Act [*Migratory Bird Conservation Act*] [...] except the inviolate sanctuary provisions.” *16 U.S.C. 718(c) Migratory Bird Hunting and Conservation Stamp*
- For “any other management purpose, for migratory birds.” *16 U.S.C. sec. 715d Migratory Bird Conservation Act*
- For “conservation purposes [...]” *7 U.S.C. sec. 2002 Consolidated Farm and Rural Development Act*

Establishing Authorities and Refuge Purposes for individual Units may be obtained online at [www.fws.gov/refuges/policiesandbudget/purposes/Purposes\\_Search.cfm](http://www.fws.gov/refuges/policiesandbudget/purposes/Purposes_Search.cfm).

### NATIONAL WILDLIFE REFUGE SYSTEM MISSION

*The mission of the System is to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans.*

### DESCRIPTION OF USE

**What is the use? Is the use a wildlife-dependent public use?** The use is as follows: use of glyphosate-tolerant corn and soybeans for habitat restoration and

management purposes on lands owned in fee title or managed through agreement by the National Wildlife Refuge System in Region 6. The primary use will be to prepare a seedbed on previously or currently cropped sites for prairie reconstruction purposes. An additional use would include incorporation into a station's integrated pest management program for the control of invasive and noxious plant species. An example would be use on System-managed lands behind flood control dams where prairie restoration would not be warranted due to the likelihood of future flooding.

The use is not a wildlife-dependent public use.

**Where would the use be conducted?** The use would be conducted on lands owned in fee title or managed through agreement by the System in Region 6, in Colorado, Kansas, Montana, Nebraska, North Dakota, South Dakota, Utah, and Wyoming, that are currently farmed or have previously been farmed and contain soils and receive average precipitation to support growth of agricultural soybeans and corn.

**When would the use be conducted?** Use would be ongoing. The use of glyphosate-tolerant soybeans and corn would be allowed as part of an integrated pest management program used to prepare a seedbed for habitat restoration and management and/or to control noxious and invasive vegetation.

**How would the use be conducted?** Use would be conducted by cooperative farmers through a cooperative farming agreement or by SUP.

**Why is this use being proposed?** Refuge managers' experience combined with published literature indicates that use of glyphosate-tolerant soybeans and corn—which allows for the application of an herbicide containing the active ingredient glyphosate during the growing season—is very effective at killing invasive cool season grasses and other noxious and invasive species. This results in a weed-free seedbed used for habitat restoration purposes, which increases the possibility of successful habitat reconstruction efforts on System-managed and -owned lands.

## AVAILABILITY OF RESOURCES

Resources involved in the administration and management of the use:

- No additional management or administrative costs will be associated with this activity.
- Special equipment, facilities, or improvements necessary to support the use: none
- Maintenance costs: none
- Monitoring costs: none
- Offsetting revenues: none

## ANTICIPATED IMPACTS OF THE USE

**Short-Term Impacts.** The use of glyphosate-tolerant soybeans and corn will increase the likelihood that conservation tillage can be successfully conducted, reducing soil erosion.

**Long-Term Impacts.** The effective reconstruction of degraded and weed-infested habitats on System lands to native mixed-grass and tallgrass prairie which can be managed through the historical ecological processes of prescribed fire and prescribed grazing, will cumulatively reduce needed expenditures of labor and funds for weed control efforts on System lands in Region 6 over the long term.

## STIPULATIONS NECESSARY TO ENSURE COMPATIBILITY

1. Refuge managers will comply with all existing and current policies regarding the use of genetically modified crops (glyphosate-tolerant soybeans and corn).
2. Activity will occur only on currently farmed or previously farmed System-owned or -managed lands.

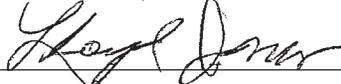
## PUBLIC REVIEW AND COMMENT

The period of public review and comment was held from February 2, 2011 through March 4, 2011. A total of eleven written comments were received. Responses to substantive comments can be found in appendix F.

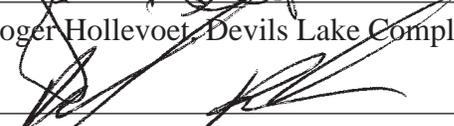
**Why was this level of public review and comment selected?** It is appropriate to provide opportunity to comment on this compatibility determination at the same time as the draft environmental assessment. The proposed activity has a national as well as local level of interest, and it was felt that a full month with wide distribution should be given to review.

Signature: Refuge Manager

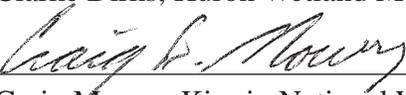
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 Kim Hanson, Arrowwood Complex (Signature) (Date)

 3/28/11  
 Lloyd Jones, Audubon Complex (Signature) (Date)

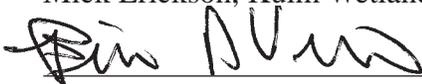
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 Roger Hollevoet, Devils Lake Complex (Signature) (Date)

 3/24/11  
 Mike Rich, Flint Hills National Wildlife Refuge (Signature) (Date)

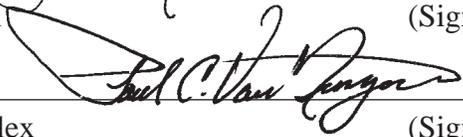
 3/25/2011  
 Clarke Dirks, Huron Wetland Management District (Signature) (Date)

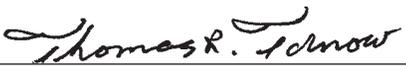
 3-28-11  
 Craig Mowry, Kirwin National Wildlife Refuge (Signature) (Date)

 3/29/2011  
 Mick Erickson, Kulm Wetland Management District (Signature) (Date)

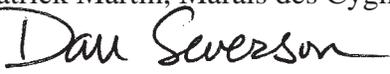
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 Brian DeVries, Lacreek National Wildlife Refuge (Signature) (Date)

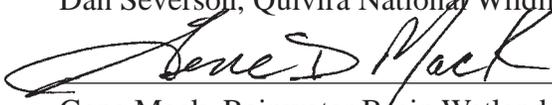
 3/25/2011  
 Mike Bryant, Lake Andes Complex (Signature) (Date)

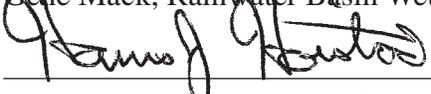
 3/25/2011  
 Paul VanNingen, Long Lake Complex (Signature) (Date)

 3-25-11  
 Tom Turnow, Madison Wetland Management District (Signature) (Date)

 3/28/2011  
 Patrick Martin, Marais des Cygnes National Wildlife Refuge (Signature) (Date)

 4/6/2011  
 Dan Severson, Quivira National Wildlife Refuge (Signature) (Date)

 3-29-11  
 Gene Mack, Rainwater Basin Wetland Management District (Signature) (Date)

 3-28-11  
 Harris Hoistad, Sand Lake Complex (Signature) (Date)

Kelly M. Hogan 3/25/11  
Kelly Hogan, Souris River Basin Complex (Signature) (Date)

Rob Bundy 3/25/11  
Rob Bundy, Tewaukon Complex (Signature) (Date)

Larry D Martin 29 March 2  
Larry Martin, Waubay Complex (Signature) (Date)

**Review:** Regional Compatibility Coordinator Lloyd Jones 3/22/11  
Lloyd Jones (Date)

**Review:** Zone Supervisor J. Paul Cornes 4-18-11  
Paul Cornes (Date)

**Review:** Zone Supervisor Barbara Boyle 4-18-11

**Concurrence:** Regional Chief Richard A Coleman 4/18/11  
Rick Coleman (Date)

**Mandatory 10- or 15-year Re-Evaluation Date:** 2021

## COMPATIBILITY DETERMINATION

For

### Structural Additions on Grassland and FmHA Easements

**Use:** Construction of buildings, structures, or the planting of shelterbelts on a grassland or FmHA easement. Examples include farmstead buildings, livestock facilities, storage sheds, or the planting of trees (shelterbelt) to serve as a windbreak.

**Refuge Name:**

**South Dakota Wetland Management Districts** – Huron, Lake Andes, Madison, Sand Lake & Waubay WMDs; Lacreek NWR.

**North Dakota Wetland Management Districts** - Arrowwood, Audubon, Chase Lake, Crosby, Devils Lake, J. Clark Salyer, Kulm, Long Lake, Lostwood, Tewaukon, & Valley City.

**Montana Wetland Management Districts** – Benton Lake, Bowdoin, Charles M. Russell, Northeast Montana, & Northwest Montana.

**County:** All counties within the Districts listed.

**Establishing and Acquisition Authority(ies):**

Migratory Bird Conservation Act, as amended (16 U.S.C. 715-715r); Migratory Bird Hunting and Conservation Stamp Act, as amended (16 U.S.C. 718-718j); North American Wetlands Conservation Act (NAWCA), as amended (16 U.S.C. 4401-4414); Fish and Wildlife Act (16 U.S.C. 742f); Land and Water Conservation Fund Act, as amended (916 U.S.C. 4601-9); Consolidated Farm and Rural Development Act (7 U.S.C. 2002).

**Refuge Purpose(s):**

“...as Waterfowl Production Areas” subject to “...all of the provisions of such Act (Migratory Bird Conservation Act)...except the inviolate sanctuary provisions...” 16 U.S.C. 718(c) (Migratory Bird Hunting and Conservation Stamp Act).

“...for any other management purposes, for migratory birds.” 16 U.S.C. 715d (Migratory Bird Conservation Act).

“...for conservation purposes...” 7 U.S.C. 2002 (Consolidated Farm and Rural Development Act).

“...for conservation...of...wildlife resources...” 16 U.S.C. 742f (Fish and Wildlife Act).

“...for the benefit of wetlands-associated migratory birds...” 16 U.S.C. 4401-4414 (NAWCA).

**National Wildlife Refuge System Mission:**

“The Mission of the National Wildlife Refuge System (System) is to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans.” (National Wildlife Refuge System Administration Act, as amended [16 U.S.C. 668dd-ee]).

**Description of Use:**

*What is the use? Is the use a wildlife-dependent public use?*

A landowner will occasionally have a need to construct additional structures or facilities, or to plant a shelterbelt to serve as a windbreak, to more efficiently and effectively continue the management of the easement property.

*Where would the use be conducted?*

Such proposals may be requested on grassland or FmHA easement-protected areas. For most additional structures or facilities, the activity will occur adjacent to existing farmsteads, the base of operations for a farm/ranch, or on a former building site. However, some expansions may occur away from these areas; an example would be the construction of a calving shed in the middle of an easement.

*When would the use be conducted?*

If secondary or associated impacts exist and can be avoided by restricting the time period for the use, then stipulations restricting the use to avoid these impacts will be used. However, in general, the proposed activities may occur at any time.

*Why is this use being proposed?*

Most easement landowners live on farms and ranches and their livelihoods are centered on agriculture. More specifically, many grassland easement landowners are ranchers who run livestock operations which result in enhanced species composition and structure of native prairie. In order to better manage or to continue to manage the grasslands protected by easements, these operations will occasionally have a need to expand by constructing additional buildings, facilities or windbreaks on lands protected by easement.

**Availability of Resources:**

*Resources involved in the administration and management of the use:*

Financial and staff resources are determined to be sufficient at each field station to administer these requests. Staff time will be needed to evaluate the proposed use, to prepare the site-specific permits, and to ensure compliance with the permit authorization and stipulations necessary to ensure compatibility.

*Special equipment, facilities, or improvements necessary to support the use:* None

*Maintenance costs:* None

*Monitoring costs:* None

*Offsetting revenues:* None

**Anticipated Impacts of the Use:**

*Short-term impacts:*

There may be temporary disturbance to easement-protected grasslands adjacent to the development area from the construction activities. There would be minimal or non-detected disturbance to wildlife as a result of this activity; what would occur would be temporary.

*Long-term impacts:*

Authorized use of easement-protected grasslands for expanded farmsteads, farm or ranch facilities, or farmstead windbreaks will result in a loss or destruction of the grasslands where the facilities are built. The remainder of the easement tract will not be affected. When conducted on or adjacent to an existing or former building site, which is preferred, the disturbance caused by the expanded farmstead, additional buildings or facilities, or new/ expanded windbreaks is not expected to contribute to habitat fragmentation. When conducted in an area not previously disturbed, these projects will be sited in a manner which limits, to the extent practical, the amount of habitat fragmentation. This can be accomplished by siting additional buildings or facilities along the margins of the easement area.

The impacts associated with these uses will be minimal due to the relatively small size or acreage of the proposed facilities and the infrequency of their authorization. If multiple requests are received from the same landowner or for the same easement by a different or subsequent landowner, these requests will be evaluated independently from one another. Each grassland easement may be authorized up to a threshold level of 8 acres of total impact, whether it occurs at one time or through different approved requests. Therefore, only up to 8 acres of potential grassland impact may be authorized on a grassland easement to accommodate permitted expansion or construction of additional buildings or structures, or shelterbelt for farmstead windbreak purposes. If multiple requests for uses on the same easement are received, each will be evaluated independently of one another. However, total impacted area from all activities may not exceed 8 acres per easement contract, whether it occurs at one time from one request or over time from multiple requests.

There will be no secondary or associated impacts allowed within this Compatibility Determination. Fragmentation of grassland habitats will be minimized to the extent practicable by restricting the permitted activities to areas adjacent to existing infrastructure or at the margins of easement whenever feasible. If the potentially affected grassland provides habitat for a wildlife species of management concern, such as a grouse lek or burrowing owl nesting site, then the use may not be permitted, or permitted only with stipulation that would eliminate the secondary or associated impacts.

*Cumulative impacts:*

Managers from 18 wetland management districts in Region 6 with grassland were polled in 2011 to get a better understanding of how many requests have been granted for more permanent type of impacts since 2005. There are approximately 1.1 million acres of grassland easements in Region 6. Since 2005, approximately 275 requests have been received to build a permanent structure or a permanent modification of the grassland easement. Of these, 15 requests have been granted for a total impact of 81 acres. The following summarizes these uses:

- 11 Residences/Farm expansions totaling 66 acres

6 of these were honoring verbal agreements made at signing of easements for 41 acres. (note: prior to signing of the programmatic CD in 2005, Service policy allowed up to 8 acres for development at managers' discretion; at that time, the Service would include abandoned farmsteads in easement agreements and landowners were told they would have some flexibility to develop these areas.

3 were farm expansions for a total of 13 acres. These were instances where the son or a family member came back to help on the farm or ranch.

2 were new developments in new locations for a total of 12 acres. These were sons or family members who wanted to assist with the family farm/ranch.

- 2 Storage Buildings (expansions of farmstead) for a total of 6 acres.

In the original 2005 programmatic CD for this activity, it was anticipated that between 40 and 80 acres would be impacted *annually*. However, actual uses approved and acres impacted over the past five years numbered far fewer. A cumulative impact of 0.016% of easement area was originally estimated and deemed insignificant. An actual impact of approximately 0.00007% was realized and is also deemed insignificant.

Therefore, if the rate of grassland easement acquisition remains the same for the next 10 years (approximately 50,000 acres/yr), and assuming the number of requests authorized via this CD remain consistent with past authorizations (0.00007% of the protected area), then the cumulative impacts from activities authorized with this CD will be approximately 112 acres of an estimated 1.6 million acres of grassland.

**Public Review and Comment:**

The period of public review and comment began on March 10<sup>th</sup>, 2011 and ended on March 24<sup>th</sup>, 2011.

*The following methods were used to solicit public review and comment:*

Public notices were posted at all wetland district offices (see end of this CD).

*Why was this level of public review and comment selected?*

This method was selected because the proposed activity is considered minor, incidental, infrequent, and has minimal impact.

*Summarize comments received and any actions taken or not taken as a result:*

No comments were received.

**Determination:**

The use is compatible with the following stipulations:

**Stipulations Necessary to Ensure Compatibility:**

1. In order to protect important migratory bird breeding habitat in a working landscape where the human economic environment is centered on farming and ranching, the proposed use must adhere to a spirit of cooperation and coordination with these activities in a manner that supports the continued growth of the Refuge System.
2. The proposed use must relate to the management/operation of the easement interest in a manner which supports the biological integrity, diversity, and environmental health of the easement. Examples include a calving shed or an equipment storage building. Farmstead expansion may be considered if the expansion can be demonstrated to support the continued management of the easement area in a manner beneficial to migratory bird use; e.g., an expansion that facilitates the passing of a ranching operation from one generation to the next.
3. The proposed use must also have no reasonable alternative to be conducted on a non-easement protected area, must not be able to be accommodated by a temporary permit, and must be determined not to materially interfere with or detract from the purpose of the easement or the mission of the System.
4. Issuance of authorization does not preclude the requirements for obtaining necessary permits and/or approvals from other County, State, or Federal agencies and from local landowners, if applicable.
5. Storage of building materials or disposal of fill material from the construction project will not be allowed on easement-protected grassland areas.
6. Additional stipulations may be added or included to address specific concerns with individual projects or requests, or to address any secondary or associated impacts which may occur as a result of the project.

**Justification:**

The NWRS Administration Act, as amended in 1997, directs the Secretary to “plan and direct the continued growth of the System in a manner that is best designed to...contribute to the conservation of ecosystems...” The Act also calls on the Secretary to “...ensure effective coordination, interaction, and cooperation with owners of land adjoining refuges...” The Service has protected approximately 1.1 million acres of grassland with easements; however, the Service also has a goal of protecting an additional 10 million acres to conserve the grassland ecosystem in the Prairie Pothole Region. Since the Service only purchases easements from willing sellers, the continued growth of the Refuge System in order to achieve the conservation of the grassland ecosystem (as mandated by the Act) requires effective coordination, interaction, and cooperation with owners of land adjoining refuges (on easements, this would be the landowner) and their legitimate needs for development of easement lands related to the on-going management of grassland resources need to be considered.

Before a requested use can be allowed, the refuge manager must determine that the use will not materially interfere with or detract from the purpose for which the easement was acquired or the mission of the NWRS. While several broad “purposes” are listed above for the various authorizations, grassland easements purchased under these authorities are first and foremost a conveyance for “waterfowl habitat protection.” For easements acquired under these acquisition authorities, a “material interference or detraction” is construed as any activity that results in the loss of habitat to support one pair of breeding ducks (this CD is not applicable to Tallgrass Prairie easements in eastern SD and SE ND).

The Compatibility Policy does not require the use of refuge-specific biological impact data, but allows for the use of information derived from other areas or species that are similarly situated. This information should also be readily available to the refuge manager. Over 30 years of waterfowl use data from the PPR allow the Service’s Habitat and Evaluation Population Team (HAPET) in Bismarck, ND to predict waterfowl response to the anticipated impacts described by this compatibility determination. Evaluating the effect of this grassland loss from a waterfowl population perspective is not precise, because it is the loss of productivity of a hen that may or may not nest on a grassland site due to the loss of habitat that is being estimated. In other words, the Service considers the loss of habitat sufficient enough to cause the loss of one pair of ducks to be a “material” interference or detraction from the purpose for which the easement was acquired. The construction of additional buildings, facilities, or windbreaks as described in this CD substantial enough to cause this amount of loss would exceed the threshold of compatibility, as it would result in a “material” interference or detraction. Therefore, the request could not be permitted.

HAPET used the Mallard Model to evaluate the change in the productivity of the affected grassland protected by the easement. The goal was to determine the amount of habitat loss that could be sustained before the loss of one pair of ducks was detected (a material interference or detraction). In the modeling exercise, 160 acres of grassland (representative of a grassland easement) situated among 1,990 acres of cropland within a four-square mile area. This acreage and juxtaposition among cropland was chosen for the grassland area because 160 acres generally represents the smallest individual tract of land considered eligible for the grassland easement program, and the impact of grassland loss will be

detected on isolated, small grassland tracts first. HAPET incrementally removed the amount of grassland in the 160 acre tract until the reduction resulted in the detection of a loss of one pair of ducks. The model suggested that acreage to be 10 acres.

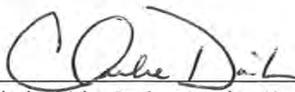
In a second modeling analysis, Breeding Bird Survey data were used to estimate the average breeding bird population on 160 acres of native prairie. A modeled loss of 5% (8 acres) showed no discernable change (positive or negative) in the breeding bird population of the 160 acre tract.

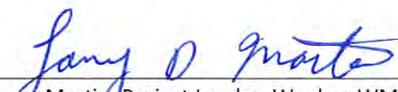
The Service proposes to continue to use the 8 acre (per easement contract) threshold of grassland impact established in the 2005 programmatic CD. The 8 acre figure (80% of the 10 acres modeled by HAPET) corresponds with the 80% value developed for the wetland impact threshold established in a separate programmatic CD (see Exhibit XII-4b in the Region 6 Easement Manual). Prior to permitting any requested use on easements, refuge managers must evaluate the request using the flowchart and accompanying narrative in Chapter XII of the Easement Manual.

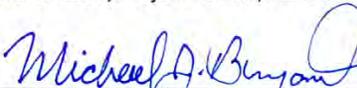
In conclusion, a requested use for additional structures, buildings, or windbreaks that do not exceed the threshold of 8 acres per easement contract are considered to not constitute a “material interference or detraction from” the purpose for which grassland and FmHA easements were established or the mission of the NWRS. They may be allowed as long as there are no reasonable alternatives which would not result in the impact to the easement and the use is one that relates to the management/operation of the easement interest in a manner which supports the biological integrity, diversity, and environmental health of the easement. Chapter XII of the Easement Manual describes the step-by-step evaluation process used by managers when considering any requested use on easement properties.

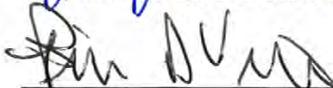
An Appropriate Use Determination and Environmental Assessment on the described use in this CD are being made concurrently with this compatibility determination.

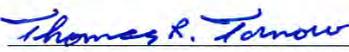
**Submitted By:**

 3-25-2011  
Clarke Dirks, Project Leader, Huron WMD Date

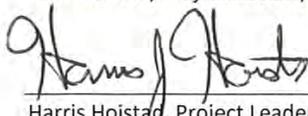
 25 March 2011  
Larry Martin, Project Leader, Waubay WMD Date

 3-25-2011  
Mike Bryant, Project Leader, Lake Andes WMD Date

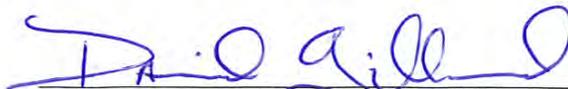
 3-25-11  
Brian Devries, Project Leader, LaCreek NWR Date

 3-25-11  
Tom Tornow, Project Leader, Madison WMD Date

 3/25/11  
Kim Hanson, Project Leader, Arrowwood Complex Date

 3-25-11  
Harris Hoistad, Project Leader, Sand Lake WMD Date

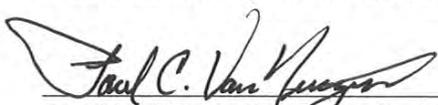
 3/25/11  
Lloyd Jones, Project Leader, Audubon WMD Date

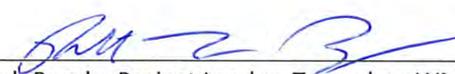
  
Dave Gillund, Project Leader, Crosby & Lostwood WMDs  
Date 3/25/11

  
Roger Hollevoet, Project Leader, Devils Lake WMD  
Date 3/25/11

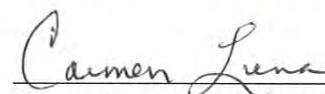
  
Kelly Hogan, Project Leader, J. Clark Salyer WMD  
Date 3/25/11

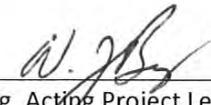
  
Mick Erickson, Project Leader, Kulm WMD  
Date 3-25-2011

  
Paul Van Ningen, Project Leader, Long Lake WMD  
Date 3-25-2011

  
Rob Bundy, Project Leader, Tewaukon WMD  
Date 3/25/11

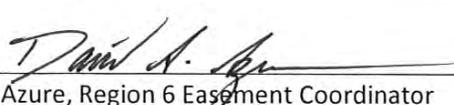
  
Kathy Burchett, Project Leader, Benton Lake WMD, NW Montana WMD  
Date 3/25/2011

  
Carmen Luna, Project Leader, Bowdoin WMD  
Date 3/25/2011

  
Bill Berg, Acting Project Leader, Charles M. Russell WMD  
Date 3/25/2011

  
Jerry Rodriguez, Project Leader, NE Montana WMD  
Date 03/25/11

Prepared By:

  
Dave Azure, Region 6 Easement Coordinator  
Date 3/25/11

**Reviewed By:**


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 Paul Cornes, Refuge Supervisor, Region 6

Date

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 Dean Rundle, Refuge Supervisor, Region 6

Date

**Approved:**


---

 Rick Coleman, ARD – Refuges/Partners for Fish & Wildlife, Region 6

Date

**Mandatory 10-year Reevaluation Date:**

10 years from the date of the APPROVAL signature

Enter here: \_\_\_\_\_

**Text of Public Notice:**

The U.S. Fish and Wildlife Service (Service) is soliciting public comments on whether to allow limited construction of buildings or structures on grassland or FmHA easements in North Dakota, South Dakota and Montana. Examples include farmstead buildings, livestock facilities, storage sheds, or the planting of trees to serve as a windbreak. These activities will cause minor temporary disturbance and insignificant permanent impact to grassland areas. Impacts to protected grasslands and habitat fragmentation will be minimized to the extent practicable through stipulations agreed to by the landowner and defined in the authorizing document. Accommodation of essential facility expansions and additions to facilitate grassland management will contribute to the biological integrity, diversity, and overall environmental health of the lands and landscapes protected by easements. People wishing to provide comments can do so by March 24<sup>th</sup>, 2011 by submitting them to the U.S. Fish & Wildlife Service, Chase Lake Prairie Project, 5924 19<sup>th</sup> St. SE, Woodworth, ND 58496. For more information, contact Dave Azure at (701) 752-4218, ext. 2.

**Compatibility Determination  
for  
Allowing Dogs on Fish & Wildlife Service Fee-Owned WPA's**

**Use:** We encourage the use of dogs for hunting. We allow dogs for other recreational activities only if the dog is confined to a vehicle, boat, ice house, or is on a leash controlled by the handler. We prohibit dog training and dogs roaming freely.

**Refuge Name:**

**North Dakota Wetland Management Districts:**

Arrowwood Wetland Management District  
Audubon Wetland Management District  
Chase Lake Wetland Management District  
Crosby Wetland Management District  
Devils Lake Wetland Management District  
J. Clark Salyer Wetland Management District  
Kulm Wetland Management District  
Long Lake Wetland Management District  
Lostwood Wetland Management District  
Tewaukon Wetland Management District  
Valley City Wetland Management District

**South Dakota Wetland Management Districts:**

Huron Wetland Management District  
Lake Andes Wetland Management District  
Madison Wetland Management District  
Sand Lake Wetland Management District  
Waubay Wetland Management District

**County:** All counties within the Districts listed above

**Establishing and Acquisition Authority(ies):**

Consolidated Farm and Rural Development Act, Migratory Bird Conservation Act, Migratory Bird Hunting and Conservation Stamp Tax, North American Wetlands Conservation Act, Emergency Wetlands Resources Act

**Refuge Purpose(s):**

"...as Waterfowl Production Areas" subject to "...all of the provisions of such Act [Migratory Bird Conservation Act] ...except the inviolate sanctuary provisions..." 16 U.S.C. 718(c) (Migratory Bird Hunting and Conservation Stamp)

“...for any other management purpose, for migratory birds.” 16 U.S.C § 715d (Migratory Bird Conservation Act)

“...for conservation purposes...” 7 U.S.C. § 2002 (Consolidated Farm and Rural Development Act)

**National Wildlife Refuge Mission:**

“The mission of the System is to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans.”

**Description of Use:**

What is the use? Is the use a wildlife-dependent public use?

Dogs are allowed for hunting. With the increase in urban encroachment, more people are recreating on WPAs, and bringing their dogs with them while hunting, ice fishing, boating, fishing, running, walking trails, etc. Controlled use of dogs on WPAs will not threaten wildlife. This is a wildlife dependent use.

Where would the use be conducted?

The use would be conducted on WPAs in all the Wetland Management Districts listed.

When would the use be conducted?

The use could be conducted at any time of the year.

How would the use be conducted?

The use would be conducted as long as the owner maintains control of the dog. Confined and controlled dogs are expected to have little to no effect on our wildlife resources.

Why is this use being proposed?

Recreational users are requesting this use to allow the companionship of their dogs while they are visiting WPAs for consumptive and non consumptive uses.

**Availability of Resources:**

Resources involved in the administration and management of the use:

No additional management of administrative costs will be associated with this activity.

Special equipment, facilities, or improvements necessary to support the use:

None

Maintenance Costs: None

Monitoring Costs: None

Offsetting revenues: None

**Anticipated Impacts of the Use:**

Short-term impacts:

There would be minimal or non-detected disturbance to wildlife as a result of the activity, and what would occur would be very temporary.

Long-term impacts:

Confined and controlled dogs are expected to have little to no effect on the wildlife resources. There would be no long-term impacts.

Cumulative impacts:

There would be no negative cumulative impacts to WPAs. The use may provide an increase in visitor use as the users can now bring along their family pet dog.

**Public Review and Comment:**

The period of public review and comment began 06/18/2010 and ended 07/02/2010.

The following methods were used to solicit public review and comment:

Posted notices in public places.

Why was this level of public review and comment selected?

The proposed activity is considered minor, with minimal temporary disturbance and no negative permanent and cumulative impacts.

Summarize comments received and any actions taken or not taken because of comments received:

Received: No Comments were received during period of public review. Attached are comments received prior to the public review that resulted in the proposed change in wording on dog uses.

**Determination:**

Use is compatible with the following stipulations:

**Stipulations Necessary to Ensure Compatibility:**

Dogs are allowed for hunting. Dogs used for other activities must be confined to a vehicle, boat, or ice house, or is on a leash controlled by the handler. We prohibit dog training and dogs allowed to roam freely.

**Justification:**

There will be minimal temporary disturbance and/or permanent impact to WPAs by this activity. The use will not materially interfere with or detract from the mission or purpose of the NWRS.

If the proposed use is an economic use of refuge natural resources, how would it contribute to the purposes of the refuge or the mission of the National Wildlife Refuge System?

It is not an economic use.

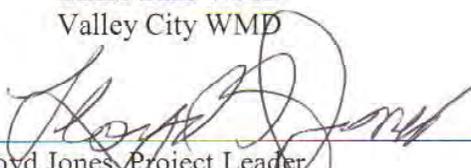
**Text of Public Notice:**

The U.S. Fish and Wildlife Service (Service) is soliciting public comments on General Regulations on the uses of dogs in addition to hunting on Waterfowl Production Areas in North Dakota and South Dakota. The regulation on the use of dogs will state: “We encourage the use of dogs for hunting. We allow dogs for other activities, only if the dog is confined to a vehicle, boat, or ice house, or is on a leash controlled by the handler. We prohibit dog training and dogs roaming freely.”

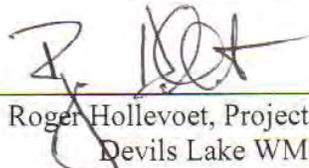
People wishing to provide comments can do so by July 2 by submitting them to the Zone Law Enforcement Office, P.O. Box 48 Madison SD or Zone Law Enforcement, 3425 Miriam Avenue, Bismarck, ND 58501. For more information, contact Ray Portwood at 605 256-2974 or David Bonham at (701) 355-8572.

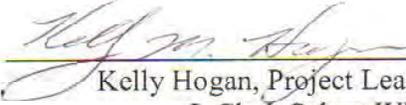
Submitted:

  
\_\_\_\_\_  
Kim Hanson, Project Leader  
Arrowwood WMD  
Chase Lake WMD  
Valley City WMD  
7/15/2010  
Date

  
\_\_\_\_\_  
Lloyd Jones, Project Leader  
Audubon WMD  
7/15/10  
Date

  
\_\_\_\_\_  
Dave Giffund, Project Leader  
Crosby WMD  
Lostwood WMD  
7/15/10  
Date

  
\_\_\_\_\_  
Roger Hollevoet, Project Leader  
Devils Lake WMD  
7/16/2010  
Date

  
\_\_\_\_\_  
Kelly Hogan, Project Leader  
J. Clark Salyer WMD  
7/15/2010  
Date

  
\_\_\_\_\_  
Mick Erickson, Project Leader  
Kulm WMD  
7/15/2010  
Date

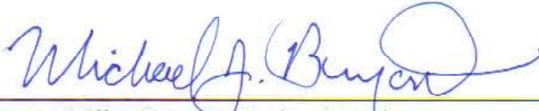
  
\_\_\_\_\_  
Paul Van Ningen, Project Leader  
Long Lake WMD  
7/15/2010  
Date

  
\_\_\_\_\_  
Rob Bundy, Project Leader  
Tewaukon WMD  
7/15/2010  
Date

Clark Dirks, Project Leader  
Huron WMD

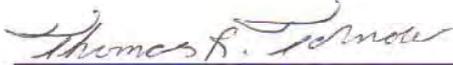
7/15/2010

Date

Mike Bryant, Project Leader  
Lake Andes WMD

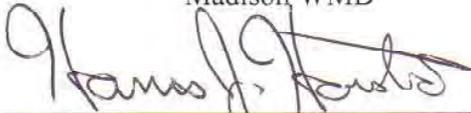
7-15-2010

Date

Tom Tornow, Project Leader  
Madison WMD

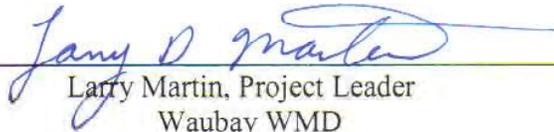
7-15-2010

Date

Harris Hoistad, Project Leader  
Sand Lake WMD

7-15-10

Date

Larry Martin, Project Leader  
Waubay WMD

7-15-10

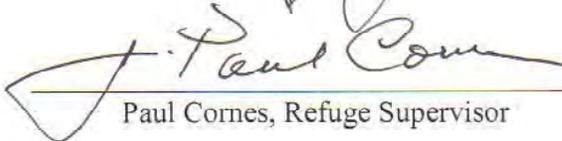
Date

**Reviewed:**

Lloyd Jones, Regional Compatibility Coordinator



Date



Paul Cornes, Refuge Supervisor

9-27-10

Date

**Approved:**Rick Coleman, ARD – Refuges/Partners for Fish & Wildlife  
Region 6

9/28/10

Date

**Mandatory 10-year Re-Evaluation Date:**

10 years from the date of the “Approved” signature

**COMPATIBILITY DETERMINATION**  
**for**  
**PUBLIC AND PRIVATE**  
**BURIED UTILITY LINES**  
**OCCURRING ON**  
**FWS**  
**EASEMENT PROPERTIES**  
**or Fee-Owned WPA's**

**Use:** Projects associated with buried utility lines and/or cables where impacts to Service lands and interests are only temporary and minor. Requests from utility companies, rural water systems, and minor impacts associated with some highway improvement projects, and certain requests from private landowners. The use covered by this compatibility determination is in conjunction with the Region 6 Policy Memorandum of April 5, 2002, entitled "Rights-of Way and Permits for Minor Disturbance Projects". See Exhibit XII-7 for a copy of the Policy Memorandum.

**Station Names:**

**South Dakota Wetland Management Districts:**

Lake Andes WMD, SD  
Madison WMD, SD  
Huron WMD, SD  
Waubay WMD, SD  
Sand Lake WMD, SD  
Lacreek NWR, SD

**North Dakota Wetland Management Districts:**

Tewaukon WMD, ND  
Kulm WMD, ND  
Arrowwood WMD, ND  
Valley City WMD, ND  
Chase Lake WMD, ND  
Audubon WMD, ND  
Long Lake WMD, ND  
J Clark Salyer WMD, ND  
Devils Lake WMD, ND  
Lostwood WMD, ND  
Crosby WMD, ND

**Montana Wetland Management Districts:**

Medicine Lake WMD, MT  
 Bowdoin WMD, MT  
 Benton Lake WMD, MT  
 Northwest Montana WMD, MT

**Establishing and Acquisition Authorities:**

Waterfowl Production Areas Wetland Easements, Grassland Easements - The Migratory Bird Hunting and Conservation Stamp Act, March 16, 1934, (16 USC Sec. 718-718h, 48 Stat. 452) as amended August 1, 1958, (PL 85-585; 72 Stat. 486) for acquisition of “Waterfowl Production Areas”; the Wetlands Loan Act, October 4, 1961, as amended (16 USC 715k-3 - 715k-5, Stat. 813), funds appropriated under the Wetlands Loan Act are merged with duck stamp receipts in the fund and appropriated to the Secretary for the acquisition of migratory bird refuges under the provisions of the Migratory Bird Conservation Act, February 18, 1929, (16 USC Sec. 715, 715d - 715r, as amended.

FmHA deed restricted properties - Consolidated Farm and Rural Development Act - (7 USC Para. 2002).

Tall Grass Prairie Tracts - Land and Water Conservation Fund Act of 1965, as amended (16 U.S.C. 460l-4 through 460l-11)

**Refuge Purpose(s):**

“...as Waterfowl Production Areas” subject to “...all of the provisions of such Act [Migratory Bird Conservation Act] ...except the inviolate sanctuary provisions...” 16 USC 718(c) (Migratory Bird Hunting and Conservation Stamp)

“...for any other management purpose, for migratory birds.” 16 USC 715d (Migratory Bird Conservation Act)

“...for conservation purposes...” 7 USC 2002 (Consolidated Farm and Rural Development Act)

**National Wildlife Refuge System Mission:**

“The Mission of the National Wildlife Refuge System is to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans” (National Wildlife Refuge System Administration Act of 1966, as amended) [16 USC 668(dd)-668(ee)].

**Description of Use:**

Wetland Management Districts receive frequent requests from utility companies to cross fee and easement properties with buried pipelines, electric cables, communications lines, natural gas lines, and/or rural or potable water lines or systems. These requests are generally part of an overall area-wide project to provide better services to the people residing in the area. When these types of projects are proposed in the Prairie Pothole Region, it may not be possible to avoid all Service land interests (fee and easement), and therefore, some Service property interests may be temporarily impacted during the construction period. This use includes requests for projects on wetland, grassland, FmHA, or conservation easements or fee-owned Waterfowl Production Areas. Construction methods may include cable-plowing, utilizing a vibrating cable-plow, or narrow trenching equipment. In each case, the surface disturbance is minimal, and the temporary cable or trenching scar will grow over with grass or marsh vegetation within a year or two.

A second area covered by this Compatibility Determination is requests received to temporarily alter upland sites in conjunction with highway maintenance projects to improve highway safety. These activities may be outside the existing highway right-of-way, but a formal ROW expansion is not needed because of the only temporary impacts to Service interests. An example of this type of request is for back-sloping a hill adjacent to the ROW to remove a snow catch area. Construction methods here include stripping away the vegetation and topsoil, removing enough of the hill to satisfy the sloping requirements, re-spreading the topsoil, and reseeding the vegetation to the manager's specifications.

It is expected that the use will be conducted as a one time event in the summer season when frost no longer exists and conditions have dried sufficiently to minimize grass disturbance. There is little to no future maintenance.

**Availability of Resources:**

Financial and staff resources are determined to be sufficient at each field station to administer these requests. Staff time will be needed to evaluate the proposed use, to prepare the site-specific permits, and to insure compliance with the permit authorization and stipulations, as well as checking for satisfactory restoration of any disturbed sites after the reseeded areas have had a chance to grow in.

No specialized equipment will be necessary, as the work requirement associated with these projects is monitoring and compliance checking only. Actual work, including restoration needs, will be completed by the applicant as specified by the wetlands manager.

### **Anticipated Impacts of the Use:**

The uses authorized under this compatibility determination must result in impacts that are only very minor and temporary in nature. In other words, there will be NO long term negative impacts to Service land or water interests.

Examples of work authorized under this Compatibility Determination include:

- trenched and backfilled areas to accommodate buried pipelines and cables
- buried utility lines or PVC water lines using a cable plow
- excavated trenches using a backhoe equipped with a “trenching” bucket (approximately 8 inches wide).
- use of crawler-type equipment to shave hills and back-sloping associated with highway safety projects which may extend beyond the existing ROW.

Anticipated impacts are as follows:

- temporary disturbance to the grassland area during and for a period of time following the backfilled trench
- some wildlife may be temporarily displaced during the actual construction
- water quality may be temporarily and slightly reduced due to possible silt deposition if a rainstorm washes the exposed areas for a short period of time after backfilling the trenches or washing of the exposed back-sloped areas.

There will be no long-term impacts nor will there be any cumulative impacts to Service lands or interests.

### **Public Review and Comment:**

The period of public review and comment began April 10, 2005 and ended April 17, 2005.

Posted notices were made in public places for each of the field stations listed on this Compatibility Determination. This method was selected because the proposed activity is considered minor, incidental, infrequent, with only short-term disturbance, and/or displacement of wildlife. No comments were received as a result of the posted notices.

**Determination:**

**Compatibility Threshold:** Material Interference of Detraction from the Purposes and/or Mission of the NWRS.

\_\_\_\_\_ Use is Not Compatible

XXX Use is Compatible with the Following Stipulations

**Stipulations Necessary to Ensure Compatibility:**

1. Issuance of a permit does not preclude the requirements for obtaining necessary permits and/or approvals from other County, State, or Federal Agencies and from local landowners.
2. The permit is issued subject to the revocation and appeals procedure contained in Title 50, Part 25 of the Code of Federal Regulations.
3. The proposed activity will result in no impacts to wetlands protected by FWS easements. No wetlands or any part thereof will be filled with any material, leveled by any equipment, drained by any means including pumping or by diverting water, or burned.
4. Any work within protected wetland basins will be backfilled and compacted to the normal contour of the wetland bottom. No excess, non-compacted fill will be permitted.
5. Upland impacts to areas protected by FWS grassland easements will be only temporary. Any disturbed areas will be leveled, seeded, and restored to pre-work condition as specified by the Refuge Manager.
6. Additional stipulations may be added to address specific concerns with individual projects.
7. The authorization under the permit issued in accordance with this determination is for the initial construction only; any future maintenance or repairs will require additional consultation with the Wetland Management District office, and will require a supplemental permit issued prior to the initiation of any remedial work.

**Justification:**

There will be minimal and temporary disturbance to the wetland and grassland resources protected by the Service's fee or easement by this activity. The use will not detract from or materially interfere with the mission or purpose of the NWRS. The uses covered by this CD are considered NOT to be an economic use under the guidelines found in 50CFR29.1.

Prior to issuing any permit, the manager will have worked with the applicant to avoid as many impacts as possible, and then to minimize any impacts to Service interests. The impacts are deemed to be minor and only temporary, and complete site restoration will occur, usually with the next growing season.

Where possible, and without compromising any preservation program goal or objective, and without affecting (in the long term) any land interest held by the Service, it is critically important that field stations be able to accommodate these requested uses which are designed to improve highway safety or the quality of life in rural America.

**Mandatory 10-Year Reevaluation Date:**

10 years from the date of APPROVAL signature.

Enter Reevaluation Date: \_\_\_\_\_

Signatures:

Submitted: Michael J. Bryant 3/10/2005  
Michael Bryant, Project Leader Date  
Lake Andes WMD

Thomas S. Tomnow 3-10-05  
Tom Tomnow, Project Leader Date  
Madison WMD

Harris J. Hoistad 3-10-05  
Harris Hoistad, Project Leader Date  
Huron WMD

Larry D. Martin 3-10-05  
Larry Martin, Project Leader Date  
Waubay WMD

Gene Williams 3-10-05  
Gene Williams, Project Leader Date  
Sand Lake WMD

Tom Koerner 3-10-05  
Tom Koerner, Project Leader Date  
Lacreek NWR

Jack Lalor 4/26/05  
Jack Lalor, Acting Project Leader Date  
Tewaukon WMD

Dave Azure 3-10-05  
Dave Azure, Acting Project Leader Date  
Kulm WMD

Kim D. Hanson 3/10/05  
Kim D. Hanson, Project Leader Date  
Arrowwood WMD  
Chase Lake WMD  
Valley City WMD

Gary Williams 3/10/05  
Gary Williams, Acting Project Leader Date  
Audubon WMD

*Paul Van Ningen*  
 Paul Van Ningen, Project Leader  
 Long Lake WMD  
 Date 3/10/2005

*Tedd Gutzke*  
 Tedd Gutzke, Project Leader  
 J Clark Salyer WMD  
 Date 3/10/2005

*R. Hollevoet*  
 Roger Hollevoet, Project Leader  
 Devils Lake WMD  
 Date 3/10/05

*Fred G. Giese*  
 Fred G. Giese, Project Leader  
 Lostwood WMD  
 Crosby WMD  
 Date 04/26/05

*Michael D. Rabenberg*  
 Michael Rabenberg, Acting Project Leader  
 Medicine Lake WMD  
 Date 04/26/05

*Carmen R. Luna*  
 Carmen Luna, Project Leader  
 Bowdoin WMD  
 Date 4/26/05

*David Gilland*  
 David Gilland, Project Leader  
 Benton Lake WMD  
 Date 4/26/05

*Steven W. Kallan*  
 Steve Kallan, Project Leader  
 NW Montana WMD  
 Date 4/26/05

Review: *Lloyd Jones*  
 Lloyd Jones  
 Regional Compatibility Coordinator  
 Date 4/27/05

*Steve Bunch*  
4/28/05  
Refuge Supervisor  
 Date 4/28/05

Approval: *Ronald D. Shupe*  
 Ronald D. Shupe, Region 6  
 Acting Chief of Refuges  
 Date 2/10/15, 2005

**COMPATIBILITY DETERMINATION**  
**for**  
**Authorized Health and Safety Needs**  
**Associated with FWS Wetland Easements**  
**resulting in NO Permanent Impacts**

**Use:** Approved requests to temporarily pump or drain an easement protected wetland which is causing a Health and Safety problem or a major threat to personal or public property, such as flooding a road, driveway, resulting in seepage in a basement, surface waters affecting a domestic well or a sanitation system, or surface waters affecting a feed storage area or feedlot. The landowner's right to drain or otherwise alter the natural characteristics of the wetland is one of the rights the Service acquired with the easement. The use authorized under this CD is to permit temporary dewatering of protected wetlands which are posing a health and/or safety threat.

**Station Names:**

**South Dakota Wetland Management Districts:**

Lake Andes WMD, SD  
Madison WMD, SD  
Huron WMD, SD  
Waubay WMD, SD  
Sand Lake WMD, SD  
Lacreek NWR, SD

**North Dakota Wetland Management Districts:**

Tewaukon WMD, ND  
Kulm WMD, ND  
Arrowwood WMD, ND  
Valley City WMD, ND  
Chase Lake WMD, ND  
Audubon WMD, ND  
Long Lake WMD, ND  
J Clark Salyer WMD, ND  
Devils Lake WMD, ND  
Lostwood WMD, ND  
Crosby WMD, ND

**Montana Wetland Management Districts:**

Medicine Lake WMD, MT  
 Bowdoin WMD, MT  
 Benton Lake WMD, MT  
 Northwest Montana WMD, MT

**Establishing and Acquisition Authorities:**

Waterfowl Production Areas Wetland Easements, Grassland Easements - The Migratory Bird Hunting and Conservation Stamp Act, March 16, 1934, (16 USC Sec. 718-718h, 48 Stat. 452) as amended August 1, 1958, (PL 85-585; 72 Stat. 486) for acquisition of “Waterfowl Production Areas”; the Wetlands Loan Act, October 4, 1961, as amended (16 USC 715k-3 - 715k-5, Stat. 813), funds appropriated under the Wetlands Loan Act are merged with duck stamp receipts in the fund and appropriated to the Secretary for the acquisition of migratory bird refuges under the provisions of the Migratory Bird Conservation Act, February 18, 1929, (16 USC Sec. 715, 715d - 715r, as amended.

FmHA deed restricted properties - Consolidated Farm and Rural Development Act - (7 USC Para. 2002).

Tall Grass Prairie Tracts - Land and Water Conservation Fund Act of 1965, as amended (16 U.S.C. 460l-4 through 460l-11)

**Refuge Purpose(s):**

“...as Waterfowl Production Areas” subject to “...all of the provisions of such Act [Migratory Bird Conservation Act] ...except the inviolate sanctuary provisions...” 16 USC 718(c) (Migratory Bird Hunting and Conservation Stamp)

“...for any other management purpose, for migratory birds.” 16 USC 715d (Migratory Bird Conservation Act)

“...for conservation purposes...” 7 USC 2002 (Consolidated Farm and Rural Development Act)

**National Wildlife Refuge System Mission:**

“The Mission of the National Wildlife Refuge System is to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans” (National Wildlife Refuge System Administration Act of 1966, as amended) [16 USC 668(dd)-668(ee)].

**Description of Use:**

During times of high water cycles or excessive runoff, prairie wetlands can temporarily swell to an oversized condition. The easement agreements provide for this natural fluctuation in wetland hydrology and relief is generally not authorized. However, when the over-full wetland basins result in situations which involve health, safety, or major threats to public or landowner appurtenances which cannot be resolved without violating the easement and for which no reasonable alternative exists, then the Service is authorized to provide relief to nullify the Health and Safety threat. The use associated with this category of request results in either pumping or draining the problem-causing wetland, lowering its elevation to a point that the problem is resolved. Situations involving Health and Safety include: major threats to buildings, roads, and infrastructure; basement flooding caused by high water in a nearby wetland, barnyard or feedlot flooding, driveway or other road flooding, or threat to domestic water supply or sewer system

The use results in ONLY a temporary lowering of the wetland. If a drainage ditch was used to lower the wetland, it must be filled to the original contour of the land after the wetland has been lowered, and the threat has subsided.

The use could occur in any of the Wetland Management Districts listed within the CD, and would likely occur during or shortly after the spring runoff or after a large rainstorm event. These are the conditions which sometimes result in the protected wetland basins becoming larger than the historic photo record would indicate.

Any requested use to lower the water levels of protected wetlands will result in ONLY temporary impacts, lasting a year or two.

**Availability of Resources:**

Financial and staff resources are determined to be sufficient at each field station to administer these requests. Staff time will be needed to evaluate the proposed use, to prepare the site-specific permits, and to insure compliance with the permit authorization and stipulations, as well as checking for satisfactory restoration of any disturbed sites after the wetland areas have returned to more historical elevations.

No specialized equipment will be necessary, as any work associated with these projects involves monitoring and compliance checking only. Actual work, including restoration needs, will be completed by the applicant as specified by the wetlands manager.

**Anticipated Impacts of the Use:****Short-term Impacts:**

Short-term impacts include the temporary loss of some wetlands habitat because of the authorized lowering of the wetland causing the Health and Safety problem. Since this is only a temporary authorization, limitations of the amount of lowering needed will not be imposed except to require the least amount necessary to resolve the issue. The length of time will be “until the situation is resolved” NTE one year. Permits can be extended if necessary.

After the situation has been resolved, the wetland’s hydrology will be restored, and if drainage was used to reduce the wetlands’s volume, then the drainage facilities will be restored to a “pre-work” condition.

**Long-term Impacts:**

There will be no long-term impacts associated with this authorization to resolve a Health and Safety issue.

**Cumulative Impacts:**

There will be no cumulative impacts as a result of possible numerous authorizations because there are no permanent impacts. The authorization will be granted only to resolve the issue at hand.

**Public Review and Comment:**

The period of public review and comment began April 10, 2005 and ended April 17, 2005.

Posted notices were made in public places for each of the field stations listed on this Compatibility Determination. This method was selected because the proposed activity is considered minor, incidental, infrequent, with only short-term disturbance, and/or displacement of wildlife. No comments were received as a result of the posted notices.

**Determination:**

**Compatibility Threshold:** Material Interference of Detraction from the Purposes and/or Mission of the NWRS.

\_\_\_\_\_ Use is Not Compatible

XXX Use is Compatible with the Following Stipulations

**Stipulations Necessary to Ensure Compatibility:**

1. Issuance of a permit does not preclude the requirements for obtaining necessary permits and/or approvals from other County, State, or Federal Agencies and from local landowners.
2. The permit is issued subject to the revocation and appeals procedure contained in Title 50, Part 25 of the Code of Federal Regulations.
3. When the Health and Safety threat has subsided, the wetland will be allowed to function under natural hydrological cycles. Any drainage facilities which were installed to lower the wetland will be restored, compacted, and rendered non-functional.
4. If the area is also protected with a Service grassland easement, then the backfilled ditch will also be reseeded to the specifications of the wetland manager.

**Justification:**

There will be only temporary disturbance to the wetland and possible grassland resources protected by the Service's easement by this activity. The use will not detract from or materially interfere with the mission or purpose of the NWRS. The uses covered by this CD are considered NOT to be an economic use under the guidelines found in 50CFR29.1.

Where possible, and without compromising any preservation program goal or objective, and without affecting (in the long term) any land interest held by the Service, it is critically important that field stations be able to accommodate these requested uses which are designed to avert a human health and/or safety issue or a major threat to personal or public property.

**Mandatory 10-Year Reevaluation Date:**

10 years from the date of APPROVAL signature. Enter Reevaluation Date: \_\_\_\_\_

Signatures:

<u>Submitted:</u> <u>Michael J. Bryant</u> Michael Bryant, Project Leader Lake Andes WMD	<u>3/10/2005</u> Date
<u>Thomas R. Tornow</u> Tom Tornow, Project Leader Madison WMD	<u>3-10-05</u> Date
<u>Harris J. Hoistad</u> Harris Hoistad, Project Leader Huron WMD	<u>3-10-05</u> Date
<u>Larry D. Martin</u> Larry Martin, Project Leader Waubay WMD	<u>3-10-05</u> Date
<u>Gene Williams</u> Gene Williams, Project Leader Sand Lake WMD	<u>3-10-05</u> Date
<u>Tom Koerner</u> Tom Koerner, Project Leader Lacreek NWR	<u>3-10-05</u> Date
<u>Jack Lalor</u> Jack Lalor, Acting Project Leader Tewaukon WMD	<u>4/26/05</u> Date
<u>Dave Azure</u> Dave Azure, Acting Project Leader Kulm WMD	<u>3-10-05</u> Date
<u>Kim D. Hanson</u> Kim D. Hanson, Project Leader Arrowwood WMD Chase Lake WMD Valley City WMD	<u>3/10/05</u> Date
<u>Gary Williams</u> Gary Williams, Acting Project Leader Audubon WMD	<u>3/10/05</u> Date

Paul Van Ningen  
Paul Van Ningen, Project Leader  
Long Lake WMD

3/10/2005  
Date

Thedde W. Gutzke  
Tedd Gutzke, Project Leader  
I Clark Salyer WMD

3/10/2005  
Date

R. Hollevoet  
Roger Hollevoet, Project Leader  
Devils Lake WMD

3/10/05  
Date

Fred G. Giese  
Fred G. Giese, Project Leader  
Lostwood WMD  
Crosby WMD

04/26/05  
Date

Michael D. Rabenberg  
Michael Rabenberg, Acting Project Leader  
Medicine Lake WMD

04/26/05  
Date

Carmen R. Luna  
Carmen Luna, Project Leader  
Bowdoin WMD

4/26/05  
Date

David Gilland  
David Gilland, Project Leader  
Benton Lake WMD

4/26/05  
Date

Steven W. Kallan  
Steve Kallan, Project Leader  
NW Montana WMD

4/26/05  
Date

Review:

Lloyd Jones  
Lloyd Jones  
Regional Compatibility Coordinator

4.27.05  
Date

Steve Bent  
4/28/05

Approval:

Rodney F. Krey  
Rodney Krey / Refuge Supervisor  
Ron Shupe  
Ronald D. Shupe, Region 6  
Acting Chief of Refuges

4/28/05  
3/10/15, 2005  
Date

**COMPATIBILITY DETERMINATION**  
**for**  
**Authorized Early Haying**  
**of Grassland Easements**  
**for**  
**Management Purposes**

**Use:** Authorized Early Haying of Grassland Easements and FmHA Conservation Easements.

**Station Names:**

**South Dakota Wetland Management Districts:**

Lake Andes WMD, SD  
Madison WMD, SD  
Huron WMD, SD  
Waubay WMD, SD  
Sand Lake WMD, SD  
Lacreek NWR, SD

**North Dakota Wetland Management Districts:**

Tewaukon WMD, ND  
Kulm WMD, ND  
Arrowwood WMD, ND  
Valley City WMD, ND  
Chase Lake WMD, ND  
Audubon WMD, ND  
Long Lake WMD, ND  
J Clark Salyer WMD, ND  
Devils Lake WMD, ND  
Lostwood WMD, ND  
Crosby WMD, ND

**Montana Wetland Management Districts:**

Medicine Lake WMD, MT  
Bowdoin WMD, MT  
Benton Lake WMD, MT  
Northwest Montana WMD, MT

**Establishing and Acquisition Authorities:**

Waterfowl Production Areas, Wetland Easements, Grassland Easements - The Migratory Bird Hunting and Conservation Stamp Act, March 16, 1934, (16 USC Sec. 718-718h, 48 Stat. 452) as amended August 1, 1958, (PL 85-585; 72 Stat. 486) for acquisition of “Waterfowl Production Areas”; the Wetlands Loan Act, October 4, 1961, as amended (16 USC 715k-3 - 715k-5, Stat. 813), funds appropriated under the Wetlands Loan Act are merged with duck stamp receipts in the fund and appropriated to the Secretary for the acquisition of migratory bird refuges under the provisions of the Migratory Bird Conservation Act, February 18, 1929, (16 USC Sec. 715, 715d - 715r, as amended).

FmHA deed restricted properties - Consolidated Farm and Rural Development Act - (7 USC Para. 2002).

Tall Grass Prairie Tracts - Land and Water Conservation Fund Act of 1965, as amended (16 U.S.C. 460l-4 through 460l-11)

**Refuge Purpose(s):**

“...as Waterfowl Production Areas” subject to “...all of the provisions of such Act [Migratory Bird Conservation Act] ...except the inviolate sanctuary provisions...” 16 USC 718(c) (Migratory Bird Hunting and Conservation Stamp)

“...for any other management purpose, for migratory birds.” 16 USC 715d (Migratory Bird Conservation Act)

“...for conservation purposes...” 7 USC 2002 (Consolidated Farm and Rural Development Act)

**National Wildlife Refuge System Mission:**

“The Mission of the National Wildlife Refuge System is to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans” (National Wildlife Refuge System Administration Act of 1966, as amended) [16 USC 668(dd)-668(ee)].

**Description of Use:**

Haying is the cutting and removal, by baling or stacking, and transport to an off-site location, of grass and/or forb species. Haying of grassland easement-protected properties is not restricted after July 15 each year. Landowners may hay their lands every year after

this date without compromising the terms of the easement. However, the use described in this compatibility determination is to permit early haying (prior to July 15) of the uplands to accomplish some management purpose on the land. The control of noxious weeds is primarily the target of early haying agreements. Canada thistle, a perennial, primary noxious weed, is required by state law to be controlled by each landowner. Haying can be an effective tool in controlling the seed dispersal of Canada thistle, but it must be done before the thistle flowers mature and develop wind-dispersed seeds. In many years, the thistle plants have matured and dispersed their seeds prior to July 15, and haying after seed dispersal would not be effective as a management tool.

Periodic early haying may also be authorized to help improve the vigor and health of the grass stand. It is expected that the authorized use of early haying for this purpose will be used very infrequently.

Haying prior to July 15<sup>th</sup> to increase plant density is also a management tool occasionally used. This is primarily done the first few years after a new seeding to encourage tillering and to accelerate establishment. Haying, rather than just mowing, the plants helps to prevent shading caused by the mowed vegetation left in the field. Haying done just prior to seed head development will stimulate most grass plants to propagate vegetatively by rhizomes rather than by seed production. This generally encourages grass plants to fill in bare soil areas between plants, compete more favorably with invasive species, and shorten the overall establishment period on new grass seedings.

### **Availability of Resources:**

Financial and staff resources are determined to be sufficient at each field station to administer these requests. Staff time will be needed to evaluate the proposed use, to prepare the site-specific permits, and to insure compliance with the permit authorization and stipulations necessary to insure compatibility.

### **Anticipated Impacts of the Use:**

Authorized early haying of grassland easements may displace some wildlife species during the time period the haying operation is being performed. It is possible, also, that some nesting migratory birds may be disturbed, and abandon their nests as a result of the haying operation. The decision to authorize early haying must weigh the potential benefits of legally required weed control, plant density management, and other management gains, against these short-term losses associated with the early haying.

Cutting and removal of standing grasses prior to July 15 will also result in short-term loss of habitat for those species requiring tall grasses for feeding and perching.

The impacts associated with this authorized use will be minimal since the area will likely be hayed after July 15 anyway, which is not prohibited by the easement agreement. Therefore, the impacts of the use are only between the time of authorized early haying, and July 16 in any given year.

**Public Review and Comment:**

The period of public review and comment began April 10, 2005 and ended April 17, 2005.

Posted notices were made in public places for each of the field stations listed on this Compatibility Determination. This method was selected because the proposed activity is considered minor, incidental, infrequent, with only short-term disturbance, and/or displacement of wildlife. No comments were received as a result of the posted notices.

**Determination:**

**Compatibility Threshold:** As this activity is an economic use, it must meet the compatibility threshold of “contributing to the Mission and Purposes” of the Refuge System and the Refuge Area.

\_\_\_\_\_ Use is Not Compatible

XXX Use is Compatible with the Following Stipulations

**Stipulations Necessary to Ensure Compatibility:**

1. Issuance of a permit does not preclude the requirements for obtaining necessary permits and/or approvals from other County, State, or Federal Agencies and from local landowners.
2. The permit is issued subject to the revocation and appeals procedure contained in Title 50, Part 25 of the Code of Federal Regulations.
3. Permits for early haying will not be issued in consecutive years for the same land.
4. If a permit is issued for weed control on tame grassland, a condition of the permit must include a required fall herbicide treatment of the regrown noxious weeds at the permittee’s expense.
5. Bales or stacks must be removed from the area within two weeks after baling.

6. Early haying to encourage tillering on new grass seedings should leave at least 5" of stubble to ensure sufficient leaf area needed for the responding growth.

**Justification:**

The control of noxious weeds is required of every landowner by state law, even on grassland easement-encumbered property. If infestations are severe, then a measure of weed control can be achieved by haying the lands with the infestation to limit the seed dispersal. Seed dispersal in Canada thistle often happens prior to July 15, so knocking the plants down prior to seed maturation and dispersal can help control the invading plants.

Additionally, more effective weed control can be achieved by removing the overstory of grass, allowing the tap-rooted noxious weeds to regrow, then applying a herbicide treatment. The grass will not regrow as quickly as the forb (weed) species, and the spraying application will be more effective, especially going into the fall season when the thistle plants are storing their root reserves for the winter dormant period.

Early haying to encourage tillering can shorten the establishment period of new grass seedings. Obtaining the best stand of grass in the shortest time period possible will increase wildlife use and minimize the need for weed control in subsequent years.

As such, it is concluded that the accrued benefits of more effective weed control and shorter establishment periods more than compensate for the potential short-term loss associated with authorized weed control and plant density management accomplished by haying the grassland area prior to July 15.

**Mandatory 10-Year Reevaluation Date:**

10 years from the date of APPROVAL signature

Enter date: \_\_\_\_\_

Signatures:

Submitted: Michael J. Bryant 3/10/2005  
 Michael Bryant, Project Leader  
 Lake Andes WMD Date

Thomas R. Tornow 3-10-05  
 Tom Tornow, Project Leader  
 Madison WMD Date

Harris J. Horstad 3-10-05  
 Harris Horstad, Project Leader  
 Huron WMD Date

Larry D. Martin 3-10-05  
 Larry Martin, Project Leader  
 Waubay WMD Date

Gene Williams 3-10-05  
 Gene Williams, Project Leader  
 Sand Lake WMD Date

Tom Koerner 3-10-05  
 Tom Koerner, Project Leader  
 Lacreek NWR Date

Jack Lalor 4/26/05  
 Jack Lalor, Acting Project Leader  
 Tewaukon WMD Date

Dave Azure 3-10-05  
 Dave Azure, Acting Project Leader  
 Kulm WMD Date

Kim D. Hanson 3/10/05  
 Kim D. Hanson, Project Leader  
 Arrowwood WMD  
 Chase Lake WMD  
 Valley City WMD Date

Gary Williams 3/10/05  
 Gary Williams, Acting Project Leader  
 Audubon WMD Date

Paul Van Ningen  
 Paul Van Ningen, Project Leader  
 Long Lake WMD  
 3/10/2005  
 Date

Tedd W. Gutzke  
 Tedd Gutzke, Project Leader  
 J. Clark Salyer WMD  
 3/10/2005  
 Date

Roger Hollevoet  
 Roger Hollevoet, Project Leader  
 Devils Lake WMD  
 3/10/05  
 Date

Fred G. Giese  
 Fred G. Giese, Project Leader  
 Lostwood WMD  
 Crosby WMD  
 04/26/05  
 Date

Michael Rabenberg  
 Michael Rabenberg, Acting Project Leader  
 Medicine Lake WMD  
 04/26/05  
 Date

Carmen B. Luna  
 Carmen Luna, Project Leader  
 Bowdoin WMD  
 4/26/05  
 Date

David Gilland  
 David Gilland, Project Leader  
 Benton Lake WMD  
 4/26/05  
 Date

Steve W. Kallan  
 Steve Kallan, Project Leader  
 NW Montana WMD  
 4/26/05  
 Date

Review: Lloyd Jones  
 Lloyd Jones  
 Regional Compatibility Coordinator  
 4-27-05  
 Date

Steve Burt  
 4/28/05  
Rodney F. Krey  
 Rodney Krey / Ref. Sup  
 4/28/05

Approval: Ronald D. Shupe  
 Ronald D. Shupe, Region 6  
 Acting Chief of Refuges  
 4/28/05  
 Date

**COMPATIBILITY DETERMINATION**  
**for**  
**the Cooperative Farming Program on**  
**National Wildlife Refuges and Waterfowl Production Areas**  
**for Management Purposes**

**Use:** Cooperative farming on National Wildlife Refuges and Waterfowl Production Areas in North and South Dakota.

**Station Names:**

**South Dakota Wetland Management Districts:**

Lake Andes NWR and WMD, SD  
Madison WMD, SD  
Huron WMD, SD  
Waubay NWR and WMD, SD  
Sand Lake NWR and WMD, SD  
LaCreek NWR and WMD, SD

**North Dakota Wetland Management Districts:**

Tewaukon NWR and WMD, ND  
Kulm WMD, ND  
Arrowwood NWR and WMD, ND  
Valley City WMD, ND  
Chase Lake NWR and WMD, ND  
Audubon NWR and WMD, ND  
Long Lake NWR and WMD, ND  
J Clark Salyer NWR and WMD, ND  
Devils Lake WMD, ND  
Lostwood NWR and WMD, ND  
Crosby WMD, ND  
Des Lacs NWR, ND  
Upper Souris NWR, ND

**Establishing and Acquisition Authorities:**

Arrowwood NWR; Executive Order (E.O.) 7168, Sept. 4, 1935  
Audubon NWR; 16 USC §664 (Fish and Wildlife Coord. Act)  
Chase Lake NWR; E.O. 932, Aug. 28, 1908  
Des Lacs NWR; E.O. 7154-A, Aug. 22, 1935  
Florence Lake NWR; E.O. 8119, May 10, 1939  
J. Clark Salyer NWR; E.O. 7170, Sept. 4, 1935

Kellys Slough NWR; E.O. 7320, Mar. 19, 1936  
 Lake Alice NWR; 16 USC § 715d (Mig. Bird Cons. Act)  
 Lake Ilo NWR; E.O. 8154, June 12, 1939  
 Lake Nettie NWR; E. O. 8155, June 12, 1939  
 Lake Zahl NWR; E. O. 8158, June 12, 1939  
 Long Lake NWR; E.O. 5808, Feb. 25, 1932  
 Lostwood NWR; E.O. 7171, Sept. 4, 1935  
 McLean NWR; 16 USC § 715d (Mig. Bird Cons. Act)  
 Slade NWR; 16 USC 715d (Mig. Bird Cons. Act)  
 Sullys Hill NGP; E. O. 3596, Dec. 22, 1921  
 Tewaukon NWR; Public Land Order (PLO) 286, June 26, 1945  
 Upper Souris NWR; E.O. 7161, Aug. 27, 1935

LaCreek NWR; E.O. 7160, Aug. 26, 1935  
 Lake Andes NWR; E. O. 7292, Feb. 14, 1936  
 Sand Lake NWR; E. O. 7169, Sept. 4, 1935  
 Waubay NWR; E. O. 7245, Dec. 10, 1935

Waterfowl Production Areas, Wetland Easements, Grassland Easements - The Migratory Bird Hunting and Conservation Stamp Act, March 16, 1934, (16 USC Sec. 718-718h, 48 Stat. 452) as amended August 1, 1958, (PL 85-585; 72 Stat. 486) for acquisition of “Waterfowl Production Areas”; the Wetlands Loan Act, October 4, 1961, as amended (16 USC 715k-3 - 715k-5, Stat. 813), funds appropriated under the Wetlands Loan Act are merged with duck stamp receipts in the fund and appropriated to the Secretary for the acquisition of migratory bird refuges under the provisions of the Migratory Bird Conservation Act, February 18, 1929, (16 USC Sec. 715, 715d - 715r, as amended.

### **Refuge Purpose(s):**

The Executive Orders for most of the refuges state the purpose “as a refuge and breeding ground for migratory birds and other wildlife.”

“...as Waterfowl Production Areas” subject to “...all of the provisions of such Act [Migratory Bird Conservation Act] ...except the inviolate sanctuary provisions...” 16 USC 718(c) (Migratory Bird Hunting and Conservation Stamp)

“...for any other management purpose, for migratory birds.” 16 USC 715d (Migratory Bird Conservation Act)

### **National Wildlife Refuge System Mission:**

“The Mission of the National Wildlife Refuge System is to administer a national network

of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans” (National Wildlife Refuge System Administration Act of 1966, as amended) [16 USC 668(dd)-668(ee)].

### **Description of Use:**

Cooperative farming is the term used for cropping activities done by a third party on lands that are owned in fee-title by the U. S. Fish and Wildlife Service (Service) or controlled by the Service through a conservation easement (wetland, grassland, or FmHA). This activity is usually done on a short-term basis (3-4 years or less) to provide an optimum seed bed for the establishment of native grasses and forbs or other more desirable planted cover for wildlife. Cooperative farming may also be used on certain tracts to provide a fall food source for migratory waterfowl or a winter food source for resident wildlife.

The farming is done under the terms and conditions of a Cooperative Farming Agreement or Special Use Permit (SUP) issued by the Project Leader, Refuge Manager, or Wetland District Manager. Terms of the agreement insure that all current Service and District restrictions are followed.

Cooperative farming activities are generally limited to areas of former cropland or poor quality stands of tame or cool season exotic grasses. Service policies do not allow highly erodible soils to be tilled or cropped without an approved NRCS Conservation Plan. Waterfowl Production Areas (WPAs) in the Dakotas average about 200 acres in size. Generally, areas to be cooperatively farmed at one time prior to reseeding to more desirable plant species will not be more than 50 percent of the tract. Areas on WPAs and Refuges planted for food plots will be limited to the size needed to provide sufficient food for the targeted wildlife species.

### **Availability of Resources:**

Staff time for development and administration of Cooperative Farming Agreements is already available. Most of the needed field work to prepare and plan for this use would be done as part of routine grassland management duties. The decision to use a cooperating farmer would occur as part of the overall strategy for managing lands on the Refuge or within the WMD. The additional time needed to coordinate issuance of the SUP or Cooperative Farming Agreement and oversight of the permit is relatively minor and within Refuge or WMD resources. In addition, the use of a cooperating farmer frees up other staff time from conducting the farming operation through force account.

Cooperative farming of Service lands in most cases is done on a share basis rather than for a fee. The Service typically receives its share as harvested grain used for other management purposes, as standing grain left for wildlife food, or as additional work such as

weed control, cultivation, or additional seed bed preparation, or for supplies such as herbicide or grass seed to be used on the same tract of land. Any fees or cash income received by the Service would be deposited in the Refuge Revenue Sharing Account. The Service will receive fair market value consideration from cooperating farmers, but the generation of income is a secondary consideration when developing the terms and conditions of a cooperative farming agreement or SUP.

To lessen any appearance of favoritism or impropriety, managers should follow Refuge Manual procedures for establishing rental rates and cooperator selection.

### **Anticipated Impacts of the Use:**

Cooperative farming to prepare suitable seed beds for planting better cover and habitat will result in short-term disturbances and long-term benefits to both resident and migratory wildlife using the Refuges, WPAs, and easements. Short-term impacts include disturbance and displacement of wildlife typical of any noisy heavy equipment operation, and the loss of poor quality cover while the tract is farmed. Wildlife may also use the farmed area as an additional food source for the period which it is farmed. Long-term benefits are extremely positive due to the establishment of diverse or more desirable habitat for nesting, escape cover, perching, or non-crop feeding activities. The resulting habitat will generally improve conditions for most of the species negatively affected by the short period of farming activity.

In 2004, approximately 2900 acres of Service lands were farmed under SUPs in South Dakota. North Dakota refuges and WPAs permitted an average of 6,400 acres of cooperative farming during the 1996-2000 period.

### **Public Review and Comment:**

The period of public review and comment began May 1, 2005 and ended on May 14, 2005.

Notices were posted in public places at each of the field stations listed on this Compatibility Determination. This method was selected because the proposed activity is considered minor, incidental, infrequent, with only short-term disturbance.

### **Determination:**

**Compatibility Threshold:** As this activity is an economic use, it must meet the compatibility threshold of “contributing to the Mission and Purposes” of the Refuge System and the Refuge Area. Cooperative farming is used to benefit Refuge and Waterfowl Production Area uplands and the migratory birds and other wildlife that use these lands.

\_\_\_\_\_ Use is Not Compatible

XXX Use is Compatible with the Following Stipulations

**Stipulations Necessary to Ensure Compatibility:**

1. SUPs or Cooperative Farming Agreements will specify the type of crop to be planted and describe the refuges' share.
2. The SUP may specify any herbicide or agricultural restrictions of the tract.
3. The SUP may specify timing constraints to insure that the proper field work is completed at the appropriate time.
4. The permit is issued subject to the revocation and appeals procedure contained in Title 50, Part 25 of the Code of Federal Regulations.

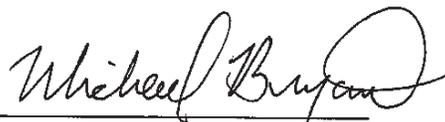
**Justification:**

The cooperative farming of Service lands or easements is done to develop or reseed better wildlife cover and habitat than was previously on the area. Only areas that have been previously cropped, or are seeded to decadent stands of cool season grasses (brome or crested wheatgrass), or decadent tame grass-legume mixes will be included in a cooperative farming plan. Cooperative farming in most cases provides the fastest, most cost effective means to establish native grasses or re-seeded cover on the Service property. In many cases, tracts are located many miles away from the Refuge or WMD headquarters, making force account labor a very time-consuming effort. The long-term benefits of managed, quality cover offset the short-term impacts and disturbance while the tract is farmed prior to seeding or re-seeding.

**Mandatory 10-Year Reevaluation Date:** 10 years from the date of APPROVAL signature

**Signatures:**

**Submitted:**

  
Michael Bryant, Project Leader  
Lake Andes Complex

4/26/03  
Date

Thomas R. Tornow  
 Tom Tornow, Project Leader  
 Madison WMD

4-26-05  
 Date

Harris D. Hoistad  
 Harris Hoistad, Project Leader  
 Huron WMD

4-26-05  
 Date

Larry D. Martin  
 Larry Martin, Project Leader  
 Waubay Complex

26 April 2005  
 Date

Gene Williams  
 Gene Williams, Project Leader  
 Sand Lake Complex

4-26-05  
 Date

Tom Koerner  
 Tom Koerner, Project Leader  
 LaCreek Complex

4-26-05  
 Date

Jack Lalor  
 Jack Lalor, Acting Project Leader  
 Tewaukon Complex

4/26/05  
 Date

Dave Azure  
 Dave Azure, Acting Project Leader  
 Kulm WMD

4/26/05  
 Date

Kim D. Hanson  
 Kim D. Hanson, Project Leader  
 Arrowwood Complex  
 Chase Lake WMD  
 Valley City WMD

4/26/05  
 Date

Gary Williams  
 Gary Williams, Acting Project Leader  
 Audubon Complex

4/26/05  
 Date

Paul C. Van Ningen  
 Paul Van Ningen, Project Leader  
 Long Lake Complex

4/26/05  
 Date

Theodore Gutzke  
Tedd Gutzke, Project Leader  
J Clark Salyer Complex

April 26, 2005  
Date

R. Hollevoet  
Roger Hollevoet, Project Leader  
Devils Lake Complex

4/26/05  
Date

Fred G. Giese  
Fred G. Giese, Project Leader  
Des Lacs Complex

04/26/05  
Date

Dean Knauer  
Dean Knauer, Project Leader  
Upper Souris NWR

4-27-05  
Date

Review:

Lloyd Jones  
Lloyd Jones  
Regional Compatibility Coordinator

4.27.05  
Date

Rodney F. Krey  
Rod Krey  
Refuge Supervisor, ND-SD

4/28/05  
Date

Approval:

Ronald D. Shupe  
Ronald D. Shupe, Region 6  
Acting Chief of Refuges

May 15, 2005  
Date

**COMPATIBILITY DETERMINATION**  
**for**  
**Prescribed Haying of Grasslands**  
**on National Wildlife Refuges and Waterfowl Production Areas**  
**for Management Purposes**

**Use:** Prescribed Haying of Grasslands on National Wildlife Refuges and Waterfowl Production Areas in North and South Dakota.

**Station Names:**

**South Dakota Refuges and Wetland Management Districts:**

Lake Andes NWR and WMD, SD  
 Madison WMD, SD  
 Huron WMD, SD  
 Waubay NWR and WMD, SD  
 Sand Lake NWR and WMD, SD  
 LaCreek NWR and WMD, SD

**North Dakota Refuges and Wetland Management Districts:**

Tewaukon NWR and WMD, ND  
 Kulm WMD, ND  
 Arrowwood NWR and WMD, ND  
 Valley City WMD, ND  
 Chase Lake NWR and WMD, ND  
 Audubon NWR and WMD, ND  
 Long Lake NWR and WMD, ND  
 J Clark Salyer NWR and WMD, ND  
 Devils Lake WMD, ND  
 Lostwood NWR and WMD, ND  
 Crosby WMD, ND  
 Des Lacs NWR, ND  
 Upper Souris NWR, ND

**Establishing and Acquisition Authorities:**

Arrowwood NWR; Executive Order (E.O.) 7168, Sept. 4, 1935  
 Audubon NWR; 16 USC §664 (Fish and Wildlife Coord. Act)  
 Chase Lake NWR; E.O. 932, Aug. 28, 1908  
 Des Lacs NWR; E.O. 7154-A, Aug. 22, 1935  
 Florence Lake NWR; E.O. 8119, May 10, 1939

J. Clark Salyer NWR; E.O. 7170, Sept. 4, 1935  
Kellys Slough NWR; E.O. 7320, Mar. 19, 1936  
Lake Alice NWR; 16 USC § 715d (Mig. Bird Cons. Act)  
Lake Ilo NWR; E.O. 8154, June 12, 1939  
Lake Nettie NWR; E. O. 8155, June 12, 1939  
Lake Zahl NWR; E. O. 8158, June 12, 1939  
Long Lake NWR; E.O. 5808, Feb. 25, 1932  
Lostwood NWR; E.O. 7171, Sept. 4, 1935  
McLean NWR; 16 USC § 715d (Mig. Bird Cons. Act)  
Slade NWR; 16 USC 715d (Mig. Bird Cons. Act)  
Sullys Hill NGP; E. O. 3596, Dec. 22, 1921  
Tewaukon NWR; Public Land Order (PLO) 286, June 26, 1945  
Upper Souris NWR; E.O. 7161, Aug. 27, 1935

LaCreek NWR; E.O. 7160, Aug. 26, 1935  
Lake Andes NWR; E. O. 7292, Feb. 14, 1936  
Sand Lake NWR; E. O. 7169, Sept. 4, 1935  
Waubay NWR; E. O. 7245, Dec. 10, 1935

Waterfowl Production Areas, Wetland Easements, Grassland Easements - The Migratory Bird Hunting and Conservation Stamp Act, March 16, 1934, (16 USC Sec. 718-718h, 48 Stat. 452) as amended August 1, 1958, (PL 85-585; 72 Stat. 486) for acquisition of "Waterfowl Production Areas"; the Wetlands Loan Act, October 4, 1961, as amended (16 USC 715k-3 - 715k-5, Stat. 813), funds appropriated under the Wetlands Loan Act are merged with duck stamp receipts in the fund and appropriated to the Secretary for the acquisition of migratory bird refuges under the provisions of the Migratory Bird Conservation Act, February 18, 1929, (16 USC Sec. 715, 715d - 715r, as amended.

### **Refuge Purpose(s):**

The Executive Orders for most of the refuges state the purpose "as a refuge and breeding ground for migratory birds and other wildlife."

"...as Waterfowl Production Areas" subject to "...all of the provisions of such Act [Migratory Bird Conservation Act] ...except the inviolate sanctuary provisions..." 16 USC 718(c) (Migratory Bird Hunting and Conservation Stamp)

"...for any other management purpose, for migratory birds." 16 USC 715d (Migratory Bird Conservation Act)

### **National Wildlife Refuge System Mission:**

“The Mission of the National Wildlife Refuge System is to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans” (National Wildlife Refuge System Administration Act of 1966, as amended) [16 USC 668(dd)-668(ee)].

### **Description of Use:**

Haying is the cutting and removal, by baling and transport to an off-site location, of grass or other upland vegetation for the production of livestock forage. Haying for this purpose is typically done by a cooperating farmer acting under authority of a Cooperative Farming Agreement or Special Use Permit (SUP) issued by the Project Leader, Refuge Manager or Wetland District Manager.

Haying is an effective management tool as part of an overall grassland management plan to improve and maintain Fish and Wildlife Service (Service)-managed grasslands for the benefit of migratory birds and other wildlife. Grasslands require periodic renovation to maintain vigor, diversity, and the structure necessary for migratory bird nesting. Haying can be an alternative to prescribed burning or grazing, which are the two other methods used to manage grassland habitats. If local conditions preclude the use of prescribed fire, or livestock numbers are not available, removal of biomass through haying serves to reduce unwanted overstory, reduce woody plant invasion, and open the soil surface up to sunlight. Such removal of vegetation allows for more vigorous regrowth of desirable species following the haying although results are neither as dramatic nor positive as with fire or grazing.

Haying may also be used as part of a native grass seeding strategy on newly acquired lands or on tame grass stands on older lands needing renovation. To reduce weed or undesirable species competition and minimize herbicide applications, a cooperating farmer may be used to seed the native grass seed mix and interseed with a cover crop. As a requirement of the SUP, the cooperator would be required to cut, bale, and remove the cover crop before it matures and goes to seed. The resultant hay can be used for livestock feed and haying serves the biological purpose of releasing young native grass and forb seedlings for growth with minimal competition.

A third possible use of haying on FWS-managed grasslands involves the initial steps of removing unwanted vegetation prior to seeding the tract to native grasses. Haying of a nonnative cool season stand of grass is an effective step in advance of spraying the field with herbicide to kill all existing vegetation. Removal of the heavy grass overstory by haying allows the herbicide to more effectively reach and treat the remaining target plants. Better removal of the unwanted grasses will in turn ensure better success of the planted grasses and forbs whether they are interseeded into the sod or into the soil turned over and leveled prior to seeding.

Haying is sometimes used prior to a noxious weed treatment; the tract is hayed and after a period of time, the “flush” of noxious weeds is treated with a herbicide application. Removing the vegetation through haying allows the herbicide to more effectively reach and treat the target weeds.

A more limited application of haying on FWS-managed lands involves its use for establishing fire breaks for prescribed burning. A cooperative farmer would be permitted to hay the firebreak strips in the fall. That area would then have little standing dead vegetation in the early spring, or would green up earlier in the spring and allow use as a fire break.

Prescribed haying in North Dakota averaged about 13,500 acres per year (1996-2000). In South Dakota, FWS managers use prescribed haying on about 2450 acres annually (2004 estimates).

#### **Availability of Resources:**

Financial and staff resources are determined to be sufficient at each field station to administer these requests. Staff time will be needed to evaluate the proposed use, to prepare the site-specific SUPs, and to insure compliance with the permit authorization and stipulations necessary to insure compatibility.

To lessen any appearance of favoritism or impropriety, managers should follow Refuge Manual procedures for establishing rental rates and cooperator selection.

#### **Anticipated Impacts of the Use:**

Haying will result in short-term disturbances to wildlife and long-term benefits to grasslands and the wildlife species that use these grasslands. Short-term impacts will include disturbance and displacement of wildlife typical of any noisy heavy equipment operation. Cutting and removal of standing grass will result in the short-term loss (late-summer to mid-summer the following year of habitat for those species requiring taller grass for feeding and perching. Prescribed haying will typically be scheduled after July 31 to avoid impacts to most nesting birds. Long-term benefits will accrue due to the increased vigor of the regrown grasses or the establishment of highly desirable native grass and forb species, which will improve habitat conditions for the same species affected by the short-term removal of the cover. Longer-term negative impacts may occur to some resident wildlife species such as pheasant that may lose overwinter habitat in hayed areas. Strict time constraints, and limiting grass stands to no more than 50 percent being hayed at any one time will limit the anticipated impacts to these areas.

**Public Review and Comment:**

The period of public review and comment began May 1, 2005 and ended on May 14, 2005.

Notices were posted in public places at each of the field stations listed on this Compatibility Determination. This method was selected because the proposed activity is considered minor, incidental, infrequent, with only short-term disturbance.

**Determination:**

**Compatibility Threshold:** As this activity is an economic use, it must meet the compatibility threshold of “contributing to the Mission and Purposes” of the Refuge System and the Refuge Area. Prescribed haying is used to benefit Refuge and Waterfowl Production Area grasslands and the migratory birds and other wildlife that use these grasslands.

\_\_\_\_\_ Use is Not Compatible

XXX Use is Compatible with the Following Stipulations

**Stipulations Necessary to Ensure Compatibility:**

1. Prescribed haying will generally not take place before August 1 in any given year, unless there are documented management reasons for prescribing an earlier hay date.
2. The permit is issued subject to the revocation and appeals procedure contained in Title 50, Part 25 of the Code of Federal Regulations.
3. Generally, not more than 50 percent of a tract may be hayed in any one year, unless size restrictions or habitat conditions warrant haying of more than half of the area.
4. Prescribed haying can be coupled with a light discing or dragging operation, or an interseeding of desirable species of grass or legumes to further increase the vigor of the grass stand.
5. Bales or stacks must be removed from the area by September 10.

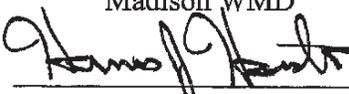
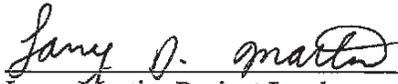
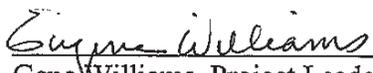
**Justification:**

Haying will not materially interfere with or detract from the purposes for which these NWRS lands were acquired or established. Haying creates temporary disturbance to vegetation. This disturbance is desirable for grassland management. Haying produces an undesirable but short-term impact to grassland nesting birds and site aesthetics. In the long-term, haying increases grassland vigor, species diversity, and habitat quality. Haying is an alternative management tool that can be used to replace or compliment prescribed burning, mowing, or grazing of Service grasslands. Without periodic disturbance caused by haying, burning, or grazing, the health of the grassland community would decline, as would an areas potential for waterfowl and other migratory bird nesting.

**Mandatory 10-Year Reevaluation Date:** 10 years from the date of APPROVAL signature

**Signatures:**

**Submitted:**

 Michael Bryant, Project Leader Lake Andes Complex	<u>4/26/05</u> Date
 Tom Tornow, Project Leader Madison WMD	<u>4-26-05</u> Date
 Harris Hoistad, Project Leader Huron WMD	<u>4-26-05</u> Date
 Larry Martin, Project Leader Waubay Complex	<u>26 April 2005</u> Date
 Gene Williams, Project Leader Sand Lake Complex	<u>4-26-05</u> Date
 Tom Koerner, Project Leader LaCreek Complex	<u>4-26-05</u> Date



Jack Lalor, Acting Project Leader  
Tewaukon Complex

4/26/05

Date



Dave Azure, Acting Project Leader  
Kulim WMD

4/26/05

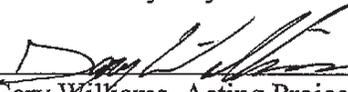
Date



Kim D. Hanson, Project Leader  
Arrowwood Complex  
Chase Lake WMD  
Valley City WMD

4/26/05

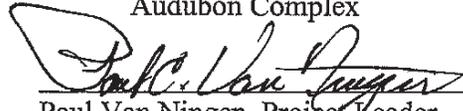
Date



Gary Williams, Acting Project Leader  
Audubon Complex

4/26/05

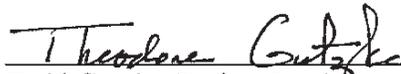
Date



Paul Van Ningen, Project Leader  
Long Lake Complex

4/26/05

Date



Tedd Gutzke, Project Leader  
J Clark Salyer Complex

April 26, 2005

Date



Roger Hollevoet, Project Leader  
Devils Lake Complex

4/26/05

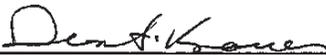
Date



Fred G. Giese, Project Leader  
Des Lacs NWR  
Lostwood WMD  
Crosby WMD

04/26/05

Date

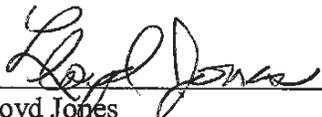


Dean Knauer, Project Leader  
Upper Souris NWR

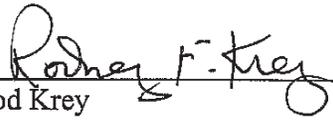
04-27-05

Date

Review:

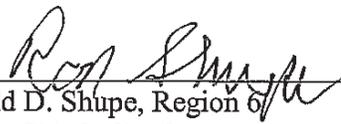
  
\_\_\_\_\_  
Lloyd Jones  
Regional Compatibility Coordinator

4-27-05  
\_\_\_\_\_  
Date

  
\_\_\_\_\_  
Rod Krey  
Refuge Supervisor, ND-SD

4/28/05  
\_\_\_\_\_  
Date

Approval:

  
\_\_\_\_\_  
Ronald D. Shupe, Region 6  
Acting Chief of Refuges

May 15, 2005  
\_\_\_\_\_  
Date

**COMPATIBILITY DETERMINATION**  
**for**  
**Prescribed Grazing on**  
**National Wildlife Refuges and Waterfowl Production Areas**  
**for Management Purposes**

**Use:** Prescribed grazing on National Wildlife Refuges and Waterfowl Production Areas in North and South Dakota.

**Station Names:**

**South Dakota Refuges and Wetland Management Districts:**

Lake Andes NWR and WMD, SD  
 Madison WMD, SD  
 Huron WMD, SD  
 Waubay NWR and WMD, SD  
 Sand Lake NWR and WMD, SD  
 LaCreek NWR and WMD, SD

**North Dakota Refuges and Wetland Management Districts:**

Tewaukon NWR and WMD, ND  
 Kulm WMD, ND  
 Arrowwood NWR and WMD, ND  
 Valley City WMD, ND  
 Chase Lake NWR and WMD, ND  
 Audubon NWR and WMD, ND  
 Long Lake NWR and WMD, ND  
 J Clark Salyer NWR and WMD, ND  
 Devils Lake WMD, ND  
 Lostwood NWR and WMD, ND  
 Crosby WMD, ND  
 Des Lacs NWR, ND  
 Upper Souris NWR, ND

**Establishing and Acquisition Authorities:**

Arrowwood NWR; Executive Order (E.O.) 7168, Sept. 4, 1935  
 Audubon NWR; 16 USC §664 (Fish and Wildlife Coord. Act)  
 Chase Lake NWR; E.O. 932, Aug. 28, 1908  
 Des Lacs NWR; E.O. 7154-A, Aug. 22, 1935  
 Florence Lake NWR; E.O. 8119, May 10, 1939

J. Clark Salyer NWR; E.O. 7170, Sept. 4, 1935  
Kellys Slough NWR; E.O. 7320, Mar. 19, 1936  
Lake Alice NWR; 16 USC § 715d (Mig. Bird Cons. Act)  
Lake Ilo NWR; E.O. 8154, June 12, 1939  
Lake Nettie NWR; E. O. 8155, June 12, 1939  
Lake Zahl NWR; E. O. 8158, June 12, 1939  
Long Lake NWR; E.O. 5808, Feb. 25, 1932  
Lostwood NWR; E.O. 7171, Sept. 4, 1935  
McLean NWR; 16 USC § 715d (Mig. Bird Cons. Act)  
Slade NWR; 16 USC 715d (Mig. Bird Cons. Act)  
Sullys Hill NGP; E. O. 3596, Dec. 22, 1921  
Tewaukon NWR; Public Land Order (PLO) 286, June 26, 1945  
Upper Souris NWR; E.O. 7161, Aug. 27, 1935

LaCreek NWR; E.O. 7160, Aug. 26, 1935  
Lake Andes NWR; E. O. 7292, Feb. 14, 1936  
Sand Lake NWR; E. O. 7169, Sept. 4, 1935  
Waubay NWR; E. O. 7245, Dec. 10, 1935

Waterfowl Production Areas, Wetland Easements, Grassland Easements - The Migratory Bird Hunting and Conservation Stamp Act, March 16, 1934, (16 USC Sec. 718-718h, 48 Stat. 452) as amended August 1, 1958, (PL 85-585; 72 Stat. 486) for acquisition of "Waterfowl Production Areas"; the Wetlands Loan Act, October 4, 1961, as amended (16 USC 715k-3 - 715k-5, Stat. 813), funds appropriated under the Wetlands Loan Act are merged with duck stamp receipts in the fund and appropriated to the Secretary for the acquisition of migratory bird refuges under the provisions of the Migratory Bird Conservation Act, February 18, 1929, (16 USC Sec. 715, 715d - 715r, as amended.

**Refuge Purpose(s):**

The Executive Orders for most of the refuges state the purpose "as a refuge and breeding ground for migratory birds and other wildlife."

"...as Waterfowl Production Areas" subject to "...all of the provisions of such Act [Migratory Bird Conservation Act] ...except the inviolate sanctuary provisions..." 16 USC 718(c) (Migratory Bird Hunting and Conservation Stamp)

"...for any other management purpose, for migratory birds." 16 USC 715d (Migratory Bird Conservation Act)

**National Wildlife Refuge System Mission:**

“The Mission of the National Wildlife Refuge System is to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans” (National Wildlife Refuge System Administration Act of 1966, as amended) [16 USC 668(dd)-668(ee)].

### **Description of Use:**

Prescribed grazing is the use of livestock, usually cattle, to remove standing vegetation, reduce vegetative litter, suppress woody vegetation or noxious weeds, open up vegetation-choked wetlands, or open up areas to sunlight and encourage native grass seedlings and growth. Prescribed grazing is carefully timed, and usually of short duration (usually 2-4 weeks), to target certain species for grazing impacts in order to benefit other species for growth after the competing vegetation has been removed.

The prescribed grazing period generally will take place between April and September. Early spring grazing (mid-April through late May) is targeted at cool season exotic species and encourages warm season native grasses and forbs. Mid-season grazing (June and July), especially on non-native grasslands, stimulates fall regrowth. Late-season grazing (August and September) removes litter and encourages spring growth of cool season natives or other cool season species.

Fence construction and maintenance, often temporary electric fence, and control and rotation of the livestock, are the responsibility of cooperating private party. Market rate grazing fees are determined by the Regional Office, but may include standard deductions for fence construction and maintenance, frequent livestock rotations, construction of water gaps, or hauling/providing additional water in dry pastures.

The frequency and duration of prescribed grazing on any Refuge or WPA will be based on site-specific evaluations of the grassland being managed.

### **Availability of Resources:**

Developing grazing plans and Special Use Permits (SUPs) and monitoring compliance and biological effects requires some Service resources. Most grazing management costs; fencing labor, monitoring and moving the livestock, hauling water; are provided by the cooperator or permittee. Evaluating the grasslands for grazing prescriptions and grassland response is already a part of the stations grassland management responsibilities. Some alternative form of grassland management, prescribed burning or haying, may be used if the areas are not treated with prescribed grazing. Managing grasslands through permitted haying has comparable costs to managing a prescribed grazing program. Managed mowing is more expensive since all the labor costs are assumed by the Service. Prescribed burning can be an effective grassland management tool, but there are personnel and weather

limitations on a burning program, as well the fact the some tracts are just not suited to burning management. In addition, there is an ecological benefit to rotating grassland management techniques, such as grazing, burning, and haying, at different seasons, rather than just relying on one technique.

### **Anticipated Impacts of the Use:**

Grazing by domestic livestock has the short-term effect of removing some or much of the standing vegetation from a tract of grassland. Properly prescribed, the effect of this removal of vegetation increases the vigor of the grassland, stimulates the growth of desired species of grass and forbs, and reduces the abundance of targeted species such as cool season exotics, woody species, noxious weeds or invasive species, or cattails. Grazing in the spring may cause the loss of some bird nests due to trampling, and may cause some birds not to nest in areas being grazed. Grazing on public wildlife lands can create an aesthetic issue of concern for some people or visitors who do not understand grassland management. Prescribed grazing is usually of short duration and enhanced, most diverse and vigorous grassland habitats are the end result. Grazing livestock may create a minor and temporary disturbance to wildlife but generally do no harm. There is a slight potential for conflict between the visiting public and the livestock or the permittee, particularly during fall hunting seasons. These situations can be limited by having the livestock removed by the anticipated beginning of fall hunting seasons.

In 2004, prescribed grazing occurred on approximately 17,500 acres of Refuges and WPAs in South Dakota (202,000 fee acres). During the 1996-2000 period, approximately 39,700 acres of grasslands on North Dakota Refuges and WPAs (470,000 fee acres) were treated annually by prescribed grazing treatments.

To eliminate any appearance of favoritism or impropriety, managers should follow Refuge Manual procedures for cooperator or permittee selection.

### **Public Review and Comment:**

The period of public review and comment began May 1, 2005 and ended on May 14, 2005.

Notices were posted in public places at each of the field stations listed on this Compatibility Determination. This method was selected because the proposed activity is considered minor, incidental, infrequent, with only short-term disturbance.

### **Determination:**

**Compatibility Threshold:** As this activity is an economic use, it must meet the compatibility threshold of “contributing to the Mission and Purposes” of the Refuge System and the Refuge Area. Prescribed grazing is used to improve and manage grassland habitats

on Refuges and Waterfowl Production Areas and the migratory birds and other wildlife that use these habitats.

\_\_\_\_\_ Use is Not Compatible

XXX Use is Compatible with the Following Stipulations

**Stipulations Necessary to Ensure Compatibility:**

1. SUPs will specify the stocking rate, dates of use, and timing for each unit or grazing cell on the Refuge or WPA.
2. The standard grazing fee, as determined for each state by the Regional Office, and any standard deductions for any labor or work done on the Service lands will be included on the SUP.
3. Grazing permittees must comply with all applicable State Livestock Health laws.
4. No supplemental feeding will be allowed without authorization from the Project Leader/Manager.
5. Control and confinement of livestock will be the responsibility of the permittee.
6. The permit is issued subject to the revocation and appeals procedure contained in Title 50, Part 25 of the Code of Federal Regulations.

**Justification:**

Controlled grazing by domestic livestock will not materially interfere or detract from the purposes for which these NWRS lands were acquired or established. Prescribed livestock grazing creates temporary disturbances to vegetation. Many of these disturbances are desirable for grassland management. Grazing produces an undesirable but short-term impact to grassland nesting birds and site aesthetics. In the long-term, prescribed grazing increases grassland vigor, species diversity, and habitat quality. Prescribed grazing is an alternative management tool that can be used to replace or complement prescribed burning, mowing, or haying of Service grasslands. Without periodic disturbance caused by haying, burning, or grazing, the health of the grassland community would decline, as would an areas potential for waterfowl and other migratory bird nesting.

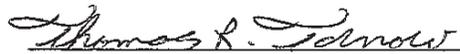
**Mandatory 10-Year Reevaluation Date:** 10 years from the date of APPROVAL signature

**Signatures:**

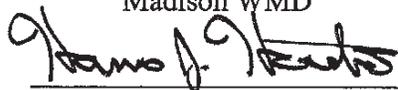
**Submitted:**

  
Michael Bryant, Project Leader  
Lake Andes Complex

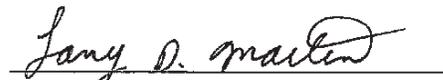
4/26/05  
Date

  
Tom Tornow, Project Leader  
Madison WMD

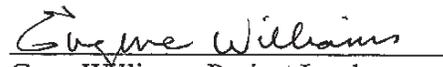
4-26-05  
Date

  
Harris Hoistad, Project Leader  
Huron WMD

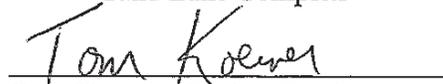
4-26-05  
Date

  
Larry Martin, Project Leader  
Waubay Complex

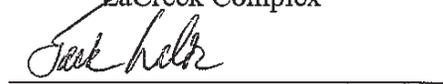
26 April 2005  
Date

  
Gene Williams, Project Leader  
Sand Lake Complex

4-26-05  
Date

  
Tom Koerner, Project Leader  
LaCreek Complex

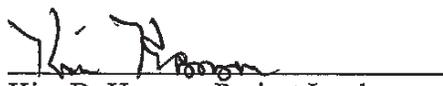
4-26-05  
Date

  
Jack Lalor, Acting Project Leader  
Tewaukon Complex

4/26/05  
Date

  
Dave Azure, Acting Project Leader  
Kulm WMD

4/26/05  
Date

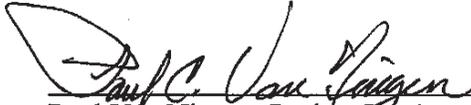
  
Kim D. Hanson, Project Leader  
Arrowwood NWR  
Chase Lake WMD  
Valley City WMD

4/24/05  
Date

  
 Gary Williams, Acting Project Leader  
 Audubon Complex

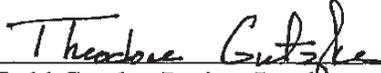
Date

4/26/05

  
 Paul Van Ningen, Project Leader  
 Long Lake Complex

Date

4/26/05

  
 Tedd Gutzke, Project Leader  
 J Clark Salyer Complex

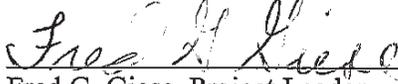
Date

April 26, 2005

  
 Roger Hollevoet, Project Leader  
 Devils Lake Complex

Date

4/26/05

  
 Fred G. Giese, Project Leader  
 Des Lacs NWR  
 Lostwood WMD  
 Crosby WMD

Date

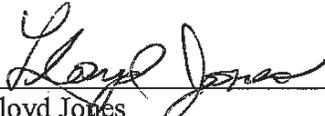
04/26/05

  
 Dean Knauer, Project Leader  
 Upper Souris NWR

Date

4-27-05

**Review:**

  
 Lloyd Jones  
 Regional Compatibility Coordinator

Date

4-27-05

  
 Rod Krey  
 Refuge Supervisor, ND-SD

Date

4/28/05

Approval:

  
\_\_\_\_\_  
Ronald D. Shupe, Region 6  
Acting Chief of Refuges

Date May 15, 2005

# Appendix B

## Key Legislation and Policies

This appendix briefly describes the guidance for the National Wildlife Refuge System and other policies and key legislation that guide the management of the Huron, Madison, and Sand Lake Wetland Management Districts.

### B.1 National Wildlife Refuge System

*The mission of the Refuge System is to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans.*

(National Wildlife Refuge System Improvement Act of 1997)

#### GOALS

- Fulfill our statutory duty to achieve refuge purpose(s) and further the System mission.
- Conserve, restore where appropriate, and enhance all species of fish, wildlife, and plants that are endangered or threatened with becoming endangered.
- Perpetuate migratory bird, interjurisdictional fish, and marine mammal populations.
- Conserve a diversity of fish, wildlife, and plants.
- Conserve and restore, where appropriate, representative ecosystems of the United States, including the ecological processes characteristic of those ecosystems.
- Foster understanding and instill appreciation of fish, wildlife, and plants, and their conservation, by providing the public with safe, high-quality, and compatible wildlife-dependent public use. Such use includes hunting, fishing, wildlife observation and photography, and environmental education and interpretation.

#### GUIDING PRINCIPLES

There are four guiding principles for management and general public use of the Refuge System established by Executive Order 12996 (1996):

- **Public Use**—The Refuge System provides important opportunities for compatible wildlife-dependent recreational activities involving hunting, fishing, wildlife observation and photography, and environmental education and interpretation.
- **Habitat**—Fish and wildlife will not prosper without high-quality habitat, and without fish and wildlife, traditional uses of refuges cannot be sustained. The Refuge System will continue to conserve and enhance the quality and diversity of fish and wildlife habitat within refuges.
- **Partnerships**—America’s sportsmen and women were the first partners who insisted on protecting valuable wildlife habitat within wildlife refuges. Conservation partnerships with other Federal agencies, State agencies, tribes, organizations, industry, and the general public can make significant contributions to the growth and management of the Refuge System.
- **Public Involvement**—The public should be given a full and open opportunity to participate in decisions regarding acquisition and management of our national wildlife refuges.

### B.2 Legal and Policy Guidance

Management actions on national wildlife refuges and wetland management districts are circumscribed by many mandates including laws and executive orders, the latest of which is the Volunteer and Community Partnership Enhancement Act of 1998. Regulations that affect refuge management the most are listed below.

**American Indian Religious Freedom Act (1978)**—Directs agencies to consult with native traditional religious leaders to determine appropriate policy changes necessary to protect and preserve Native American religious cultural rights and practices.

**Americans with Disabilities Act (1992)**—Prohibits discrimination in public accommodations and services.

**Antiquities Act (1906)**—Authorizes the scientific investigation of antiquities on Federal land and provides penalties for unauthorized removal of objects taken or collected without a permit.

**Archaeological and Historic Preservation Act (1974)**—Directs the preservation of historic and archaeological data in Federal construction projects.

**Archaeological Resources Protection Act (1979), as amended**—Protects materials of archaeological interest from unauthorized removal or destruction and requires Federal managers to develop plans and schedules to locate archaeological resources.

**Architectural Barriers Act (1968)**—Requires federally owned, leased, or funded buildings and facilities to be accessible to persons with disabilities.

**Clean Water Act (1977)**—Requires consultation with the U.S. Army Corps of Engineers (404 permits) for major wetland modifications.

**Endangered Species Act (1973)**—Requires all Federal agencies to carry out programs for the conservation of endangered and threatened species.

**Executive Order 11988 (1977)**—Requires Federal agencies to provide leadership and take action to reduce the risk of flood loss, minimize the impact of floods on human safety, and preserve the natural and beneficial values served by the floodplains.

**Executive Order 12996, Management and General Public Use of the National Wildlife Refuge System (1996)**—Defines the mission, purpose, and priority public uses of the National Wildlife Refuge System. It also presents four principles to guide management of the Refuge System.

**Executive Order 13007, Indian Sacred Sites (1996)**—Directs Federal land management agencies to accommodate access to and ceremonial uses of Indian sacred sites by Indian religious practitioners, avoid adversely affecting the physical integrity of such sacred sites, and where appropriate, maintain the confidentiality of sacred sites.

**Federal Noxious Weed Act (1990)**—Requires the use of integrated management systems to control or contain undesirable plant species and an interdisciplinary approach with the cooperation of other Federal and State agencies.

**Federal Records Act (1950)**—Requires the preservation of evidence of the government's organization, functions, policies, decisions, operations, and activities, as well as basic historical and other information.

**Fish and Wildlife Coordination Act (1958)**—Allows the U.S. Fish and Wildlife Service to enter into agreements with private landowners for wildlife management purposes.

**Migratory Bird Conservation Act (1929)**—Establishes procedures for acquisition by purchase, rental, or gifts

of areas approved by the Migratory Bird Conservation Commission.

**Migratory Bird Hunting and Conservation Stamp Act (1934)**—Authorizes the opening of part of a refuge to waterfowl hunting.

**Migratory Bird Treaty Act (1918)**—Designates the protection of migratory birds as a Federal responsibility; and enables the setting of seasons and other regulations, including the closing of areas, Federal or non-Federal, to the hunting of migratory birds.

**National Environmental Policy Act (1969)**—Requires all agencies, including the Service, to examine the environmental impacts of their actions, incorporate environmental information, and use public participation in the planning and implementation of all actions. Federal agencies must integrate this Act with other planning requirements, and prepare appropriate documents to facilitate better environmental decision making. [From the Code of Federal Regulations (CFR), 40 CFR 1500]

**National Historic Preservation Act (1966), as amended**—Establishes as policy that the Federal Government is to provide leadership in the preservation of the Nation's prehistoric and historical resources.

**National Wildlife Refuge System Administration Act (1966)**—Defines the National Wildlife Refuge System and authorizes the Secretary of the Interior to permit any use of a refuge, provided such use is compatible with the major purposes for which the refuge was established.

**National Wildlife Refuge System Improvement Act of 1997**—Sets the mission and administrative policy for all refuges in the National Wildlife Refuge System; mandates comprehensive conservation planning for all units of the Refuge System.

**Native American Graves Protection and Repatriation Act (1990)**—Requires Federal agencies and museums to inventory, determine ownership of, and repatriate cultural items under their control or possession.

**Refuge Recreation Act (1962)**—Allows the use of refuges for recreation when such uses are compatible with the refuge's primary purposes and when sufficient funds are available to manage the uses.

**Rehabilitation Act (1973)**—Requires programmatic accessibility in addition to physical accessibility for all facilities and programs funded by the Federal Government to ensure that any person can participate in any program.

**Rivers and Harbors Act (1899)**—Section 10 of this Act requires the authorization of U.S. Army Corps of Engineers prior to any work in, on, over, or under navigable waters of the United States.

**Volunteer and Community Partnership Enhancement Act (1998)**—Encourages the use of volunteers to assist in the management of refuges within the Refuge System; facilitates partnerships between the Refuge System and non-Federal entities to promote public awareness of the resources of the Refuge System and public participation in the conservation of the resources; and encourages donations and other contributions.



# Appendix C

## *Preparers and Contributors*

This document is the result of the extensive, collaborative, and enthusiastic efforts by the members of the South Dakota Wetland Management District planning team below. Many others contributed insight and support.

### **CORE PLANNING TEAM**

<i>Team member</i>	<i>Position</i>	<i>Work unit</i>
Todd Boonstra	Wildlife biologist (former)	Huron Wetland Management District
Clarke Dirks	Project Leader	Huron Wetland Management District
Mark Ely	Chief, GIS Division	USFWS Regional Office, Denver, Colorado
Bridgette Flanders	Wildlife Biologist (former)	Huron Wetland Management District
Bernardo Garza	Planning Team Leader	USFWS Regional Office, Denver, Colorado
Harris Hoistad	Project Leader	Huron Wetland Management District
John Jave	Deputy Project Leader (retired)	Sand Lake National Wildlife Refuge Complex
Kyle Kelsey	Wildlife Biologist	Madison Wetland Management District
Jay Peterson	Wetland Management District Manager	Sand Lake National Wildlife Refuge Complex
Bryan Schultz	Deputy Project Leader	Madison Wetland Management District
William Schultze	Wildlife Biologist	Sand Lake National Wildlife Refuge Complex
Thomas Tornow	Project Leader	Madison Wetland Management District
Sandra Uecker	Deputy Project Leader	Huron Wetland Management District
Gene Williams	Project Leader (retired)	Sand Lake National Wildlife Refuge Complex

### **ADDITIONAL PLANNING TEAM MEMBERS**

<i>Team member</i>	<i>Position</i>	<i>Work unit</i>
Cindy Souders	Outdoor Recreational Program Specialist	USFWS Regional Office, Denver, Colorado
Mike Artmann	Wildlife Biologist / GIS	USFWS Regional Office, Denver, Colorado
Edward Meendering	Wetland Management District Manager	Valley City Wetland Management District

The Service would like to acknowledge the efforts of the following individuals and organizations toward the completion of this draft CCP and EA. The diversity, talents, and knowledge they contributed dramatically improved the vision and completeness of this document.

### **CONTRIBUTORS**

<i>Team member</i>	<i>Position</i>	<i>Work unit</i>
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Manuel Oliveira	Deputy Assistant Regional Director, Refuge System	USFWS Regional Office, Denver, Colorado
David C. Lucas	Chief, Division of Refuge Planning	USFWS Regional Office, Denver, Colorado
Paul Cornes	Refuge Supervisor (North Dakota/South Dakota)	USFWS Regional Office, Denver, Colorado
Natoma Buskness	Deputy Refuge Supervisor (North Dakota/South Dakota)	USFWS Regional Office, Denver, Colorado
Meg VanNess	Regional Archaeologist	USFWS Regional Office, Denver, Colorado
Sheri Fetherman	Chief, Division of Education and Visitor Services	USFWS Regional Office, Denver, Colorado

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<i>Team member</i>	<i>Position</i>	<i>Work unit</i>
Megan Estep	Chief Hydrologist	USFWS Regional Office, Denver, Colorado
Wayne King	Refuge Biologist	USFWS Regional Office, Denver, Colorado
Deb Parker	Writer-Editor, Division of Refuge Planning	USFWS Regional Office, Denver, Colorado
Richard Sterry	Regional Fire Planner	USFWS Regional Office, Denver, Colorado

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# Appendix D

## *Public Involvement*

Public scoping was initiated for the Huron, Madison, and Sand Lake Wetland Management Districts in a notice of intent published in July 2008. The notice announced intent to prepare a comprehensive conservation plan (CCP) and environmental assessment (EA) for the districts and to obtain suggestions and information on the scope of issues to be considered in the planning process.

Eleven public meetings were held in various locations throughout eastern South Dakota between September 8 and 11, 2008. Numerous written, verbal, and emailed comments were received during the open comment period. Comments received identified biological, social, and economic concerns regarding the different aspects of management of these districts. The mailing list for the CCP and EA includes, but is not limited to, the following.

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### D.1 Federal Officials

U.S. Senator John Thune, Washington, DC  
Senator Thune's Area Director, Pierre, South Dakota  
U.S. Senator Tim Johnson, Washington, DC  
Senator Johnson's Area Director, Pierre, South Dakota  
U.S. Representative Stephanie Herseth Sandlin, Washington, DC  
Representative Herseth Sandlin's Area Director, Pierre, South Dakota

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### D.2 Federal Agencies

Bureau of Reclamation, Pierre, South Dakota  
USDA–Farm Service Agency, Clear Lake, South Dakota; Faulkton, South Dakota; Brookings, South Dakota  
USDA–Farm Service Agency and NRCS, McIntosh, South Dakota; Pierre, South Dakota; Timber Lake, South Dakota; Mound City, South Dakota; Selby, South Dakota; Gettysburg, South Dakota; Onida, South Dakota; Chamberlain, South Dakota; Wessington Springs, South Dakota; Highmore, South Dakota; Ipswich, South Dakota; Leola, South Dakota; Aberdeen, South Dakota; Redfield, South Dakota; Huron, South Dakota; Miller, South Dakota;

DeSmet, South Dakota; Madison, South Dakota; Howard, South Dakota; Woonsocket, South Dakota  
USDA–NRCS, Mitchell, South Dakota  
USDA–APHIS, Pierre, South Dakota  
National Park Service, Omaha, Nebraska  
USFWS, Ecological Services, Pierre, South Dakota  
USFWS, National Wildlife Refuge System, Albuquerque, New Mexico; Anchorage, Alaska; Arlington, Virginia; Atlanta, Georgia; Fort Snelling, Minnesota; Hadley, Massachusetts; Portland, Oregon; Rawlins, Wyoming; Sacramento, California; Shepherdstown, West Virginia; Washington, DC  
USGS–Fort Collins Science Center, Fort Collins, Colorado

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### D.3 Tribal Officials

Sisseton-Wahpeton Oyate of the Lake Traverse Reservation, Agency Village, South Dakota  
Cheyenne River Sioux Tribe, Eagle Butte, South Dakota  
Crow Creek Sioux Tribal Council, Fort Thompson, South Dakota  
Flandreau Santee Sioux Executive Committee, Flandreau, South Dakota  
Fort Peck Assiniboine and Sioux Tribes Tribal Executive Board, Poplar, Montana  
Lower Brule Sioux Tribal Council, Lower Brule, South Dakota  
Lower Sioux Indian Community Council, Morton, Minnesota  
Oglala Sioux Tribal Council, Pine Ridge, South Dakota  
Prairie Island Indian Community, Welch, Minnesota  
Rosebud Sioux Tribal Council, Rosebud, South Dakota  
Santee Sioux Tribal Council, Niobrara, Nebraska  
Spirit Lake Tribal Council, Fort Totten, North Dakota  
Standing Rock Sioux Tribal Council, Fort Yates, North Dakota  
Upper Sioux Community of Minnesota, Granite Falls, Minnesota

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### D.4 State Officials

Governor M. Michael Rounds, Pierre, South Dakota

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## D.5 State Agencies

South Dakota Game, Fish and Parks Department,  
Pierre, South Dakota  
South Dakota State University Extension Service,  
Brookings, South Dakota

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## D.6 Local Government

County Commissioners (33)  
Resource Conservation Districts (8)  
Weed Board Office (19)

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## D.7 Organizations

American Bird Conservancy, Plains, Virginia  
American Rivers, Washington, DC  
Animal Protection Institute, Sacramento, California  
Beyond Pesticides, Washington, DC  
Defenders of Wildlife, Washington, DC  
Duck Unlimited, Great Plains Office, Bismarck, North  
Dakota  
Fund for Animals, Silver Springs, Maryland  
Izaak Walton League, Gaithersburg, Maryland  
Murie Audubon Society, Casper, Wyoming  
National Audubon Society, Fargo, North Dakota  
National Audubon Society; Washington, DC; New  
York, New York

National Trappers Association, New Martinsville,  
West Virginia  
National Wildlife Federation, Reston, Virginia  
National Wildlife Refuge Association, Washington, DC  
National Wild Turkey Federation, Bismarck, North  
Dakota  
Sierra Club, San Francisco, California; Sheridan,  
Wyoming  
The Nature Conservancy, Minneapolis, Minnesota  
The U.S. Humane Society, Washington, DC  
The Wilderness Society, Washington, DC  
Union Pacific Railroad, Omaha, Nebraska  
Wildlife Management Institute, Fort Collins, Colorado;  
Corvallis, Oregon; Washington, DC

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## D.8 Universities, Colleges, and Schools

South Dakota State University

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## D.9 Media

Newspaper outlets (29)  
Radio outlets (4)

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## D.10 Individuals

Individuals (600+)

# Appendix E

## Location Notices

### HURON WETLAND MANAGEMENT DISTRICT LOCATION NOTICES

<i>Location notice no.</i>	<i>County</i>	<i>Area</i>	<i>Priority date</i>	<i>Structure type</i>	<i>Use</i>	<i>Storage acre-feet</i>	<i>Additional information</i>
31427	Beadle	Wipf WPA	09/10/1964	Dam	Stock	1.8	—
16348	Beadle	Wipf WPA	10/07/1959	Dam	Stock	1.88	—
28661	Beadle	South Weaver WPA	11/07/1963	Dam	Stock	1.7	—
43605	Beadle	Maga-Ta-Hohpi WPA	05/06/1968	Dam	Stock	1.1	—
56366	Beadle	Maga-Ta-Hohpi WPA	06/28/1973	Dam	Stock	1.3	—
72898	Beadle	Kohnen WPA	03/20/1992	Dam	Stock	4	—
18074	Beadle	Huron WMD	06/17/1960	Dam	Stock	1	—
71278	Beadle	Huron WMD	07/18/1988	Dugout	Storage	1	—
75113	Beadle	Huron WMD	08/01/1999	Ditch plug	Wildlife	24	—
75155	Beadle	Huron WMD	09/01/1999	Ditch plug	Wildlife	4.8	—
75176	Beadle	Huron WMD	09/01/1999	Ditch plug	Wildlife	18	—
75178	Beadle	Huron WMD	09/24/1999	Ditch plug	Wildlife	2.4	—
75180	Beadle	Huron WMD	09/24/1999	Ditch plug	Wildlife	8	#1 5.6 AF #2 2.4 AF
75294	Beadle	Huron WMD	12/09/1999	Ditch plug	Wildlife	1	—
75295	Beadle	Huron WMD	12/07/1999	Ditch plug	Wildlife	8.8	—
75303	Beadle	Huron WMD	09/08/1999	Ditch plug	Wildlife	6	—
75304	Beadle	Huron WMD	09/08/1999	Ditch plug	Wildlife	17	—
72898	Beadle	Huron WMD	03/20/1992	Dam	Wildlife	4	—
719-3	Hand	Slunecka WPA	12/30/1949	Dam	Irrigation and stock	2.8	—
17096	Hand	VenJohn WPA	10/29/1959	Dam	Stock	1.2	—
2106-3	Hand	VenJohn WPA	06/30/1951	Dam	Stock	1.2	—
70978	Hand	VenJohn WPA	07/06/1987	Dam	Stock	1.2	—
12476	Hand	Boomsma WPA	03/19/1959	Dam	Stock	1.3	—
75115	Hand	Huron WMD	08/20/1999	Ditch plug	Wildlife	5.6	—
75116	Hand	Huron WMD	08/20/1999	Ditch plug	Wildlife	11.2	#1 4.2 AF #2 4.2 AF #3 2.8 AF
75119	Hand	Huron WMD	08/20/1999	Ditch plug	Wildlife	5	—
75120	Hand	Huron WMD	08/20/1999	Ditch plug	Wildlife	2	—
75296	Hand	Huron WMD	12/07/1999	Ditch plug	Wildlife	12.32	—
75567	Hand	Huron WMD	11/14/2000	Ditch plug	Wildlife	1	—
4177-3	Hyde	Harter WPA	08/25/1952	Dam	Stock	3	—
6470-3	Hyde	Cowan WPA	11/15/1954	Dam	Stock	6	—
9771	Hyde	Cowan WPA	07/26/1958	Dam	Stock	3	—
75299	Hyde	Huron WMD	12/08/1999	Ditch plug	Wildlife	4.48	—
75300	Hyde	Huron WMD	11/15/1999	Ditch plug	Wildlife	16	—

<i>Location notice no.</i>	<i>County</i>	<i>Area</i>	<i>Priority date</i>	<i>Structure type</i>	<i>Use</i>	<i>Storage acre-feet</i>	<i>Additional information</i>
75568	Hyde	Huron WMD	11/14/2000	Ditch plug	Wildlife	16.64	—
75111	Jerauld	Huron WMD	08/20/1999	Ditch plug	Wildlife	3	—
75566	Jerauld	Huron WMD	11/14/2000	Ditch plug	Wildlife	4.64	—
75297	Jerauld	Huron WMD	12/09/1999	Ditch plug	Wildlife	6.75	—
75569	Jerauld	Huron WMD	11/14/2000	Ditch plug	Wildlife	15.36	—
75565	Jerauld	Huron WMD	08/09/1999	Ditch plug	Wildlife	24	—
75114	Jerauld	Huron WMD	08/09/1999	Ditch plug	Wildlife	2	—
75298	Jerauld	Huron WMD	12/09/1999	Ditch plug	Wildlife	6.47	—
72850	Sanborn	Huron WMD	12/18/1991	Ditch plug	Fish and wildlife	20.7	—
75112	Sanborn	Huron WMD	08/20/1999	Ditch plug	Wildlife	24	—
75117	Sanborn	Huron WMD	08/25/1999	Ditch plug	Wildlife	2	—
75301	Sanborn	Huron WMD	12/20/1999	Ditch plug	Wildlife	6.4	—
75302	Sanborn	Huron WMD	12/20/1999	Ditch plug	Wildlife	17.6	—
75177	Sanborn	Huron WMD	09/22/1999	Ditch plug	Wildlife	3.5	—
75182	Sanborn	Huron WMD	08/26/1999	Ditch plug	Wildlife	10.88	—
75305	Sanborn	Huron WMD	10/25/1999	Ditch plug	Wildlife	2	—
75179	Sanborn	Huron WMD	09/22/1999	Ditch plug	Wildlife	1.5	—
75181	Sanborn	Huron WMD	09/22/1999	Ditch plug	Wildlife	3.5	—
75118	Sanborn	Huron WMD	09/20/1999	Ditch plug	Wildlife	41	#1 9 AF #2 12 AF #3 12 AF #4 8 AF
72689	Sanborn	Huron WMD	03/15/1991	Ditch plug	Stock, fish and wildlife	3.5	—
72452	Sanborn	Huron WMD	10/15/1990	Ditch plug	Stock, fish and wildlife	22.3	—
72453	Sanborn	Huron WMD	10/15/1990	Ditch plug	Stock, fish and wildlife	10.1	—
72454	Sanborn	Huron WMD	10/15/1990	Ditch plug	Stock, fish and wildlife	19	—

### MADISON WETLAND MANAGEMENT DISTRICT LOCATION NOTICES

<i>Location notice no.</i>	<i>County</i>	<i>Area</i>	<i>Priority date</i>	<i>Structure type</i>	<i>Use</i>	<i>Storage acre-feet</i>	<i>Additional information</i>
73222	Brookings	Madison WMD	09/08/1992	Dugout	Stock	20.3	—
75148	Brookings	Madison WMD	08/24/1999	Ditch	Wildlife	4.2	—
74809	Brookings	Madison WMD	09/09/1998	Ditch	Wildlife	6.2	#1 1.8 AF #2 4.4 AF
76327	Brookings	Madison WMD	08/24/2004	Dam	Fish and wildlife	3	#1 1.5 AF #2 1.5 AF
74810	Brookings	Madison WMD	09/09/1998	Ditch	Wildlife	6.6	#1 5.6 AF #2 1.0 AF
75150	Brookings	Madison WMD	08/26/1999	Ditch	Wildlife	15.2	#1 2.6 AF #2 2.4 AF #3 3.8 AF #4 6.4 AF

<i>Location notice no.</i>	<i>County</i>	<i>Area</i>	<i>Priority date</i>	<i>Structure type</i>	<i>Use</i>	<i>Storage acre-feet</i>	<i>Additional information</i>
76011	Brookings	Madison WMD	12/06/2002	Ditch plug	Wildlife	8.3	#1 0.3 AF #2 2.6 AF #3 0.8 AF #4 1.4 AF #5 2.0 AF #6 1.2 AF
76010	Brookings	Madison WMD	12/06/2002	Ditch plug	Wildlife	17.4	#1 2.6 AF #2 14.0 AF #3 0.8 AF
76009	Brookings	Madison WMD	12/06/2002	Ditch plug	Wildlife	14	#1 1.0 AF #2 0.5 AF #3 3.7 AF #4 1.1 AF #5 2.4 AF #6 1.3 AF #7 1.1 AF #8 1.0 AF #9 1.9 AF
76624	Brookings	Madison WMD	09/08/2006	Dam	Fish and wildlife	23.4	#1 9.0 AF #2 2.4 AF #3 12.0 AF
76007	Brookings	Madison WMD	12/06/2002	Ditch plug	Wildlife	15	—
76625	Brookings	Madison WMD	09/08/2006	Dam	Fish and wildlife	8.4	#1 4.8 AF #2 3.6 AF
73388	Brookings	Madison WMD	04/26/1993	Dugout	Stock	10.4	#1 4.6 AF #2 5.8 AF
75794	Brookings	Madison WMD	10/15/2001	Ditch plug	Wildlife	8	—
17-36	Brookings	Madison WMD	09/26/1955	Dugout	Stock	1.5	—
76487	Brookings	Madison WMD	10/06/2004	Dam	Fish and wildlife	2.1	—
73013	Brookings	Madison WMD	07/08/1992	Dugout	Stock	22	—
75799	Brookings	Madison WMD	08/21/2001	Ditch plug	Wildlife	21	#1 12.5 AF #2 2.5 AF #3 6.0 AF
75798	Brookings	Madison WMD	09/13/2001	Ditch plug	Wildlife	3.6	—
75803	Brookings	Madison WMD	08/21/2001	Ditch plug	Wildlife	20.1	#1 2.1 AF #2 13.6 AF #3 4.4 AF
75797	Brookings	Madison WMD	09/13/2001	Ditch plug	Wildlife	18.1	#1 7.7 AF #2 9.9 AF #3 0.5 AF
75802	Brookings	Madison WMD	08/07/2001	Ditch plug	Wildlife	18.6	#1 13 AF #2 5.6 AF
75801	Brookings	Madison WMD	08/21/2001	Ditch plug	Wildlife	4.4	#1 3.0 AF #2 1.4 AF
76008	Brookings	Madison WMD	12/06/2002	Ditch plug	Wildlife	6.6	#1 3.1 AF #2 2.7 AF #3 0.8 AF
74949	Brookings	Madison WMD	11/02/1998	Ditch	Wildlife	5.2	—
74807	Brookings	Madison WMD	08/24/1998	Ditch	Wildlife	2.3	—
72815	Brookings	Madison WMD	06/15/1991	Dugout	Stock	22.5	—
74819	Brookings	Madison WMD	08/24/1998	Ditch	Wildlife	1.5	—
74805	Brookings	Madison WMD	08/20/1998	Ditch	Wildlife	10	—

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74782	Brookings	Madison WMD	07/18/1998	Ditch	Wildlife	8.5	#1 2.0 AF #2 1.0 AF #3 2.0 AF #4 1.0 AF #5 0.5 AF #6 0.5 AF #7 1.0 AF #8 0.5 AF
76486	Brookings	Madison WMD	04/21/2005	Ditch plug	Fish and wildlife	14.3	#1 1.5 AF #2 9.8 AF #3 3.0 AF
75064	Brookings	Madison WMD	07/02/1999	Ditch	Wildlife	10	—
74820	Brookings	Madison WMD	09/02/1998	Ditch	Wildlife	14.5	#1 3.0 AF #2 11.0 AF #3 0.5 AF
74818	Brookings	Madison WMD	08/20/1998	Ditch	Wildlife	3	#1 2.0 AF #2 1.0 AF
74806	Brookings	Madison WMD	08/20/1998	Ditch	Wildlife	3.5	#1 3.0 AF #2 0.5 AF
75061	Brookings	Madison WMD	07/02/1999	Ditch	Wildlife	11	—
75151	Brookings	Madison WMD	08/26/1999	Ditch	Wildlife	8.8	—
74947	Brookings	Madison WMD	01/20/1999	Ditch	Wildlife	10	#1 5.9 AF #2 4.1 AF
73387	Brookings	Madison WMD	04/23/1993	Dugout	Stock	2	—
15939	Brookings	Madison WMD	09/17/1955	Dugout	Stock	1.3	—
75800	Brookings	Madison WMD	08/21/2001	Ditch plug	Wildlife	20.2	#1 15.6 AF #2 0.6 AF #3 4.0 AF
75149	Brookings	Madison WMD	08/24/1999	Ditch	Wildlife	7.5	—
75141	Brookings	Madison WMD	08/24/1999	Ditch	Wildlife	9.5	#1 2.5 AF #2 2.9 AF #3 4.1 AF
76738	Brookings	Madison WMD	07/11/2007	Ditch plug	Fish and wildlife	6.8	—
75060	Brookings	Madison WMD	07/02/1999	Ditch	Wildlife	11	—
76925	Brookings	Madison WMD	08/19/2009	Dam	Fish and wildlife	5.9	—
76926	Brookings	Madison WMD	08/19/2009	Dam	Fish and wildlife	14.9	—
76929	Brookings	Madison WMD	08/19/2009	Dam	Fish and wildlife	24.8	—
74113	Brookings	Madison WMD	10/15/1994	Ditch & tile plug	Wildlife	1.2	—
72436	Brookings	Madison WMD	08/09/1990	Ditch plug	Wildlife	3.1	—
74115	Brookings	Madison WMD	05/21/1994	Tile closer	Wildlife	11	—
72605	Brookings	Madison WMD	08/05/1991	Dugout	Stock, fish and wildlife	8.3	—
74761	Brookings	Madison WMD	07/27/1998	Ditch plug	Wildlife	4	#1 3.6 AF #2 0.4 AF
74530	Brookings	Madison WMD	11/07/1996	Ditch plug	Wildlife	16	#1 8.0 AF #2 8.0 AF
74500	Brookings	Madison WMD	10/17/1996	Ditch plug	Wildlife	1	—
74462	Brookings	Madison WMD	09/09/1996	Ditch plug	Wildlife	12	—
74421	Brookings	Madison WMD	08/29/1996	Dam	Wildlife	3.2	—

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74373	Brookings	Madison WMD	07/31/1996	Dam/ditch plug	Wildlife	3	—
74360	Brookings	Madison WMD	07/17/1996	Ditch plug	Wildlife	9.5	—
76694	Brookings	Madison WMD	08/10/2006	Dugout	Wildlife	1.8	—
76750	Brookings	Madison WMD	09/21/2007	Dam	Fish and wildlife	0.6	—
76749	Brookings	Madison WMD	09/21/2007	Dam	Fish and wildlife	1.7	—
76026	Deuel	Madison WMD	11/20/2002	Ditch plug	Wildlife	6	#1 1.4 AF #2 4.6 AF
75140	Deuel	Madison WMD	09/08/1999	Ditch	Wildlife	13.5	#1 1.8 AF #2 3.1 AF #3 2.2 AF #4 1.3 AF #5 5.1 AF
76062	Deuel	Madison WMD	11/26/2002	Ditch plug	Wildlife	11.6	—
76005	Deuel	Madison WMD	11/26/2002	Ditch plug	Wildlife	0.7	—
76027	Deuel	Madison WMD	11/20/2002	Ditch plug	Wildlife	14	#1 2.9 AF #2 7.5 AF #3 3.6 AF
76012	Deuel	Madison WMD	10/15/2002	Ditch plug	Wildlife	12	—
76020	Deuel	Madison WMD	07/12/2002	Ditch plug	Wildlife	18.9	#1 2.2 AF #2 1.0 AF #3 7.8 AF #4 1.3 AF #5 6.6 AF
75153	Deuel	Madison WMD	08/26/1999	Ditch	Wildlife	5.8	#1 3.3 AF #2 2.5 AF
75146	Deuel	Madison WMD	08/26/1999	Ditch	Wildlife	11.7	#1 1.5 AF #2 1.2 AF #3 4.1 AF #4 4.9 AF
75136	Deuel	Madison WMD	08/26/1999	Ditch	Wildlife	4	#1 1.5 AF #2 2.5 AF
75133	Deuel	Madison WMD	08/26/1999	Ditch	Wildlife	10.1	#1 2.6 AF #2 1.7 AF #3 1.5 AF #4 4.3 AF
75131	Deuel	Madison WMD	08/26/1999	Ditch	Wildlife	9.2	#1 1.2 AF #2 1.5 AF #3 5.2 AF #4 1.3 AF
75132	Deuel	Madison WMD	08/26/1999	Ditch	Wildlife	2.6	#1 1.4 AF #2 1.2 AF
75137	Deuel	Madison WMD	08/26/1999	Ditch	Wildlife	19	#1 1.6 AF #2 6.8 AF #3 3.2 AF #4 1.1 AF #5 4.2 AF #6 2.1 AF
75134	Deuel	Madison WMD	08/26/1999	Ditch	Wildlife	12.7	#1 5.4 AF #2 2.8 AF #3 1.6 AF #4 2.9 AF
75147	Deuel	Madison WMD	08/26/1999	Ditch	Wildlife	5.1	—

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75135	Deuel	Madison WMD	08/26/1999	Ditch	Wildlife	4.8	#1 2.5 AF #2 2.3 AF
75139	Deuel	Madison WMD	08/26/1999	Ditch	Wildlife	20.6	#1 4.1 AF #2 10.5 AF #3 1.2 AF #4 4.8 AF
75820	Deuel	Madison WMD	07/24/2001	Ditch plug	Wildlife	12.1	#1 2.5 AF #2 3.2 AF #3 6.4 AF
76742	Deuel	Madison WMD	07/01/2007	Ditch plug	Fish and wildlife	9.7	#1 1.4 AF #2 0.8 AF #3 7.5 AF
75152	Deuel	Madison WMD	08/26/1999	Ditch	Wildlife	4.1	—
75154	Deuel	Madison WMD	08/26/1999	Ditch	Wildlife	21.7	#1 3.6 AF #2 6.8 AF #3 8.6 AF #4 2.7 AF
75142	Deuel	Madison WMD	08/26/1999	Ditch	Wildlife	11.8	#1 1.4 AF #2 10.4 AF
76150	Deuel	Madison WMD	06/05/2003	Ditch plug	Wildlife	8.9	—
75815	Deuel	Madison WMD	07/24/2001	Ditch plug	Wildlife	14.4	#1 10.5 AF #2 1.8 AF #3 2.1 AF
75810	Deuel	Madison WMD	10/01/2001	Ditch plug	Wildlife	12	—
75795	Deuel	Madison WMD	10/01/2001	Ditch plug	Wildlife	9	#1 3 AF #2 2 AF #3 2 AF #4 2 AF
75792	Deuel	Madison WMD	10/01/2001	Ditch plug	Wildlife	20	—
75793	Deuel	Madison WMD	10/01/2001	Ditch plug	Wildlife	5	#1 3 AF #2 2 AF
75138	Deuel	Madison WMD	08/26/1999	Ditch	Wildlife	10.4	#1 1.2 AF #2 5.9 AF #3 1.7 AF #4 1.6 AF
76149	Deuel	Madison WMD	06/03/2003	Ditch plug	Wildlife	24.8	#1 14.4 AF #2 5.6 AF #3 4.8 AF
76145	Deuel	Madison WMD	06/03/2003	Ditch plug	Wildlife	1.4	—
76144	Deuel	Madison WMD	06/05/2003	Ditch plug	Wildlife	2.5	—
76143	Deuel	Madison WMD	06/03/2003	Ditch plug	Wildlife	13.9	#1 4.7 AF #2 0.6 AF #3 8.6 AF
76739	Deuel	Madison WMD	07/10/2007	Ditch plug	Fish and wildlife	21	—
76147	Deuel	Madison WMD	06/03/2003	Ditch plug	Wildlife	9.6	#1 5.6 AF #2 4.0 AF
76148	Deuel	Madison WMD	06/03/2003	Ditch plug	Wildlife	18.5	#1 15.8 AF #2 2.7 AF
76930	Deuel	Madison WMD	08/19/2009	Dam	Fish and wildlife	24.9	—
76931	Deuel	Madison WMD	08/19/2009	Dam	Fish and wildlife	16.4	—
76932	Deuel	Madison WMD	08/19/2009	Dam	Fish and wildlife	16.7	—

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76146	Deuel	Madison WMD	06/03/2003	Ditch plug	Wildlife	19.8	#1 8.1 AF #2 1.2 AF #3 2.4 AF #4 3.8 AF #5 1.2 AF #6 2.1 AF #7 1.0 AF
76310	Deuel	Madison WMD	10/23/2003	Ditch plug	Wildlife	23	—
76623	Deuel	Schaeffer WPA	09/08/2006	Dam	Fish and wildlife	3.9	#1 0.8 AF #2 1.7 AF #3 1.4 AF
76321	Deuel	Madison WMD	08/11/2004	Dam	Fish and wildlife	8.4	#1 3.3 AF #2 0.6 AF #3 0.8 AF #4 2.3 AF #5 0.9 AF #6 0.5 AF
76128	Deuel	Madison WMD	02/13/2003	Ditch plug	Wildlife	10	—
76741	Deuel	Madison WMD	07/10/2007	Ditch plug	Fish and wildlife	15.8	—
76740	Deuel	Madison WMD	07/10/2007	Ditch plug	Fish and wildlife	14.9	—
76928	Deuel	Madison WMD	05/26/2010	Dam	Fish and wildlife	12.1	#1 0.9 AF #2 2.0 AF #3 4.2 AF #4 1.1 AF #5 1.8 AF #6 0.3 AF #7 1.8 AF
76933	Deuel	Madison WMD	08/19/2009	Dam	Fish and wildlife	19.8	—
76934	Deuel	Madison WMD	08/19/2009	Dam	Fish and wildlife	17.7	—
76935	Deuel	Madison WMD	08/19/2009	Dam	Fish and wildlife	11.1	—
76936	Deuel	Madison WMD	08/19/2009	Dam	Fish and wildlife	23.4	—
76937	Deuel	Madison WMD	08/19/2009	Dam	Fish and wildlife	23.4	—
76938	Deuel	Madison WMD	08/19/2009	Dam	Fish and wildlife	16.9	—
76939	Deuel	Madison WMD	08/19/2009	Dam	Fish and wildlife	21.1	—
76940	Deuel	Madison WMD	08/19/2009	Dam	Fish and wildlife	13.3	—
74917	Deuel	Madison WMD	11/18/1998	Ditch plug	Wildlife	0.5	—
75355	Deuel	Madison WMD	05/15/2000	Ditch plug	Wildlife	21.9	#1 5.3 AF #2 3.0 AF #3 4.8 AF #4 2.5 AF #5 3.5 AF #6 2.8 AF
74919	Deuel	Madison WMD	11/18/1998	Ditch plug	Wildlife	13.5	—
74918	Deuel	Madison WMD	11/18/1998	Ditch plug	Wildlife	9	#1 8.0 AF #2 0.5 AF #3 0.5 AF
75353	Deuel	Madison WMD	05/12/2000	Ditch plug	Wildlife	2.2	—
75354	Deuel	Madison WMD	05/12/2000	Ditch plug	Wildlife	10.3	#1 3.5 AF #2 6.8 AF
74706	Deuel	Madison WMD	10/15/1997	Dam/ditch plug	Wildlife	11.4	#1 4.6 AF #2 6.8 AF

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74705	Deuel	Madison WMD	10/15/1997	Dam/ditch plug	Wildlife	24.2	#1 2.2 AF #2 4.0 AF #3 5.0 AF #4 13.0 AF
74704	Deuel	Madison WMD	10/15/1997	Dam/ditch plug	Wildlife	13.8	#1 4.4 AF #2 1.2 AF #3 3.4 AF #4 4.8 AF
74703	Deuel	Madison WMD	10/15/1997	Dam/ditch plug	Wildlife	24.8	#1 14.2 AF #2 10.6 AF
74685	Deuel	Madison WMD	10/15/1997	Dam/ditch plug	Wildlife	4.4	—
74684	Deuel	Madison WMD	10/15/1997	Dam/ditch plug	Wildlife	8.8	—
74683	Deuel	Madison WMD	10/15/1997	Dam/ditch plug	Wildlife	19.2	#1 6.4 AF #2 12.8 AF
74709	Deuel	Madison WMD	10/15/1997	Dam/ditch plug	Wildlife	24.8	—
74708	Deuel	Madison WMD	10/15/1997	Dam/ditch plug	Wildlife	14.4	—
74681	Deuel	Madison WMD	10/15/1997	Dam/ditch plug	Wildlife	3	—
75496	Deuel	Madison WMD	09/19/2000	Ditch plug	Wildlife	12.8	#1 2.4 AF #2 1.6 AF #3 3.0 AF #4 5.8 AF
75495	Deuel	Madison WMD	09/19/2000	Ditch plug	Wildlife	15.6	#1 2.4 AF #2 3.2 AF #3 1.0 AF #4 0.8 AF #5 1.0 AF #6 0.8 AF #7 6.4 AF
75471	Deuel	Madison WMD	09/18/2000	Ditch plug	Wildlife	20.4	—
75466	Deuel	Madison WMD	09/13/2000	Ditch plug	Wildlife	21.6	—
75491	Deuel	Madison WMD	09/19/2000	Ditch plug	Wildlife	18.4	#1 4.2 AF #2 7.4 AF #3 1.4 AF #4 1.6 AF #5 3.8 AF
72802	Deuel	Madison WMD	10/15/1991	Ditch plug	Wildlife	11.5	#1 9.0 AF #2 2.5 AF
74501	Deuel	Madison WMD	10/16/1996	Ditch plug	Wildlife	1	—
74499	Deuel	Madison WMD	10/16/1996	Ditch plug	Wildlife	18	—
74341	Deuel	Madison WMD	06/03/1996	Dam/ditch plug	Wildlife	6	—
74682	Deuel	Madison WMD	10/15/1997	Dam/ditch plug	Wildlife	12	#1 8.4 AF #2 3.6 AF
74707	Deuel	Madison WMD	10/15/1997	Dam/ditch plug	Wildlife	23.6	#1 1.0 AF #2 1.0 AF #3 21.6 AF
74680	Deuel	Madison WMD	10/15/1997	Dam/ditch plug	Wildlife	20.6	#1 7.6 AF #2 2.4 AF #3 10.6 AF
22406	Deuel	Madison WMD	08/18/1961	Dry draw dam	Stock	1.2	—
75286	Deuel	Madison WMD	12/19/1999	Dam	Wildlife	18.3	—
75483	Deuel	Madison WMD	09/27/2000	Ditch plug	Wildlife	1.8	—
76760	Deuel	Madison WMD	09/04/2007	Dugout	Stock	1	—

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75255	Deuel	Madison WMD	11/19/1999	Ditch plug	Wildlife	14.2	#1 3.2 AF #2 1.4 AF #3 0.9 AF #4 1.1 AF #5 2.7 AF #6 3.1 AF #7 1.8 AF
74920	Deuel	Madison WMD	11/18/1998	Ditch plug	Wildlife	3.5	#1 1.5 AF #2 2.0 AF
73567	Deuel	Madison WMD	07/15/1993	Dam/ditch plug	Wildlife	5.6	—
75513	Hamlin	Madison WMD	10/24/2000	Ditch plug	Wildlife	16.6	#1 6.1 AF #2 5.8 AF #3 4.7 AF
75512	Hamlin	Madison WMD	10/24/2000	Ditch plug	Wildlife	1	—
75514	Hamlin	Madison WMD	10/24/2000	Ditch plug	Wildlife	24.5	#1 10.5 AF #2 14.0 AF
74519	Hamlin	Madison WMD	10/31/1996	Ditch plug	Wildlife	5	#1 2.0 AF #2 3.0 AF
74518	Hamlin	Madison WMD	10/31/1996	Dam	Wildlife	10	—
73223	Hamlin	Madison WMD	09/08/1992	Dugout	Stock	12.8	—
75805	Hamlin	Madison WMD	07/24/2001	Ditch plug	Wildlife	6.3	#1 2.1 AF #2 4.2 AF
74829	Hamlin	Madison WMD	09/28/1998	Ditch	Wildlife	6.1	#1 3.8 AF #2 2.3 AF
76332	Hamlin	Madison WMD	08/25/2003	Ditch plug	Wildlife	18	—
74993	Hamlin	Madison WMD	05/05/1999	Ditch	Wildlife	1.8	—
16803	Hamlin	Madison WMD	10/16/1959	Dam	Stock	1.2	—
48932	Hamlin	Madison WMD	05/12/1970	Dry Draw	Stock	—	—
76323	Hamlin	Madison WMD	07/27/2004	Dam	Fish and wildlife	18	—
73167	Hamlin	Madison WMD	08/21/1992	Ditch plug	Wildlife	11	—
76019	Kingsbury	Madison WMD	02/21/2002	Ditch plug	Wildlife	8	—
66260	Kingsbury	Madison WMD	06/23/1978	Dry draw	Stock	1.1	—
76479	Kingsbury	Madison WMD	10/12/2004	Dam	Fish and wildlife	15.8	#1 1.5 AF #2 0.6 AF #3 1.1 AF #4 0.6 AF #5 6.8 AF #6 0.8 AF #7 2.1 AF #8 0.6 AF #9 1.7 AF
73219	Kingsbury	Madison WMD	09/09/1992	Dam/ditch	Stock	17.3	—
76478	Kingsbury	Madison WMD	10/12/2004	Dam	Fish and wildlife	9.9	#1 0.5 AF #2 1.4 AF #3 1.5 AF #4 0.8 AF #5 0.9 AF #6 1.7 AF #7 1.4 AF #8 0.8 AF #9 0.9 AF
73220	Kingsbury	Madison WMD	09/09/1992	Dam/ditch	Stock	5.5	—

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76320	Kingsbury	Madison WMD	08/11/2004	Dam	Fish and wildlife	14.2	#1 3.3 AF #2 0.6 AF #3 1.5 AF #4 7.4 AF #5 1.4 AF
03099	Kingsbury	Madison WMD	08/02/1971	Dugout	Stock	1.3	—
76329	Kingsbury	Madison WMD	08/11/2004	Dam	Fish and wildlife	13.1	#1 3.5 AF #2 5.7 AF #3 3.0 AF
16673	Kingsbury	Madison WMD	10/28/1959	Dugout	Stock	1.5	—
76319	Kingsbury	Madison WMD	08/11/2004	Dam	Fish and wildlife	13.6	#1 1.1 AF #2 1.9 AF #3 1.5 AF #4 1.2 AF #5 2.1 AF #6 1.8 AF #7 0.8 AF #8 0.9 AF #9 2.3 AF
75816	Kingsbury	Ratfield WPA	07/24/2001	Ditch plug	Wildlife	5.5	—
76318	Kingsbury	Madison WMD	08/11/2004	Dam	Fish and wildlife	15	—
76340	Kingsbury	Madison WMD	09/15/2004	Dam	Fish and wildlife	14.4	#1 1.7 AF #2 3.2 AF #3 3.6 AF #4 2.1 AF #5 2.1 AF #6 1.0 AF
76013	Kingsbury	Madison WMD	09/09/2002	Ditch plug	Wildlife	2	—
76341	Kingsbury	Madison WMD	09/15/2004	Dam	Fish and wildlife	11.4	#1 0.6 AF #2 2.0 AF #3 1.5 AF #4 2.3 AF #5 1.2 AF #6 3.8 AF
72814	Kingsbury	Madison WMD	06/01/1991	Dugout	Stock	22.5	—
76924	Kingsbury	Madison WMD	08/19/2009	Dam	Fish and wildlife	4.4	—
74517	Kingsbury	Madison WMD	11/01/1996	Ditch plug	Wildlife	22	#1 1.0 AF #2 1.0 AF #3 1.0 AF #4 2.0 AF #5 17.0 AF
73017	Kingsbury	Madison WMD	06/22/1992	Tile riser plug	Wildlife	24	—
74114	Kingsbury	Madison WMD	10/15/1994	Ditch plug	Wildlife	1.8	—
74118	Kingsbury	Madison WMD	07/01/1994	Dam	Wildlife	0.8	—
72722	Kingsbury	Madison WMD	09/30/1991	Dam/ditch plug	Wildlife	5	—
74811	Lake	Madison WMD	09/09/1998	Ditch	Wildlife	3.4	#1 1.2 AF #2 2.2 AF
15936	Lake	Madison WMD	09/17/1959	Dry draw	Stock	1	—
12303	Lake	Madison WMD	02/11/1959	Dry draw	Stock	1	—
53381	Lake	Madison WMD	11/24/1971	Dry draw	Stock	1	—
40540	Lake	Madison WMD	07/26/1967	Dry draw	Stock	1	—

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17459	Lake	Madison WMD	12/31/1959	Dry draw	Stock	1	—
51626	Lake	Madison WMD	06/28/1971	Dry draw	Stock	0.9	—
75808	Lake	Madison WMD	07/23/2001	Ditch plug	Wildlife	21.7	#1 4.0 AF #2 3.0 AF #3 3.2 AF #4 8.0 AF #5 3.5 AF
	Lake	Madison WMD	04/04/1972	Well	Domestic	—	—
47766	Lake	Madison WMD	10/15/1969	Dry draw	Stock	1	—
76137	Lake	Madison WMD	04/08/2003	Ditch plug	Wildlife	22	—
75809	Lake	Madison WMD	07/23/2001	Ditch plug	Wildlife	10	—
76142	Lake	Madison WMD	04/29/2003	Ditch plug	Wildlife	5	#1 3.0 AF #2 2.0 AF
76141	Lake	Madison WMD	04/29/2003	Ditch plug	Wildlife	5	—
76014	Lake	Madison WMD	07/11/2002	Ditch plug	Wildlife	2.5	—
76140	Lake	Madison WMD	04/29/2003	Ditch plug	Wildlife	10.8	#1 3.2 AF #2 7.6 AF
76006	Lake	Madison WMD	11/04/2002	Ditch plug	Wildlife	20.8	#1 6.5 AF #2 13 AF #3 1.3 AF
76138	Lake	Madison WMD	04/28/2003	Ditch plug	Wildlife	22.5	—
76025	Lake	Madison WMD	05/21/2002	Ditch plug	Wildlife	9.9	#1 1.2 AF #2 6.6 AF #3 2.1 AF
76136	Lake	Madison WMD	04/08/2003	Ditch plug	Wildlife	11	—
76135	Lake	Madison WMD	04/07/2003	Ditch plug	Wildlife	19.2	#1 3.4 AF #2 5.2 AF #3 10.6 AF
76134	Lake	Madison WMD	04/08/2003	Ditch plug	Wildlife	13	—
76133	Lake	Madison WMD	04/07/2003	Ditch plug	Wildlife	12.2	#1 9.0 AF #2 3.2 AF
76132	Lake	Madison WMD	04/07/2003	Ditch plug	Wildlife	11.2	#1 7.0 AF #2 3.3 AF #3 0.9 AF
76131	Lake	Madison WMD	04/07/2003	Ditch plug	Wildlife	17	—
76139	Lake	Madison WMD	04/29/2003	Ditch plug	Wildlife	8.6	#1 1.7 AF #2 1.5 AF #3 4.5 AF #4 0.9 AF
75812	Lake	Madison WMD	11/01/2001	Ditch plug	Wildlife	20	—
75814	Lake	Madison WMD	08/14/2001	Ditch plug	Wildlife	2.5	—
75804	Lake	Madison WMD	07/23/2001	Ditch plug	Wildlife	18.2	#1 8.5 AF #2 6.2 AF #3 3.5 AF
75811	Lake	Madison WMD	11/01/2001	Ditch plug	Wildlife	21.1	#1 10.0 AF #2 2.3 AF #3 5.2 AF #4 1.0 AF #5 1.2 AF #6 1.4 AF
75818	Lake	Madison WMD	01/29/2002	Ditch plug	Wildlife	15.5	—

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75817	Lake	Madison WMD	01/29/2002	Ditch plug	Wildlife	11	—
75813	Lake	Madison WMD	10/24/2001	Ditch plug	Wildlife	7.6	#1 4.5 AF #2 1.3 AF #3 1.8 AF
75167	Lake	Madison WMD	09/28/1999	Ditch	Wildlife	5.2	#1 1.5 AF #2 3.7 AF
74116	Lake	Madison WMD	07/01/1994	Dam	Wildlife	6.22	#1 0.5 AF #2 10.5 AF #3 1.4 AF
74119	Lake	Madison WMD	09/25/1994	Tile riser	Wildlife	8	—
75486	Lake	Madison WMD	09/29/2000	Ditch plug	Wildlife	18.6	#1 8.1 AF #2 9.1 AF #3 1.4 AF
75515	Lake	Madison WMD	10/24/2000	Ditch plug	Wildlife	20.5	—
74735	McCook	Madison WMD	05/27/1998	Ditch plug	Wildlife	10	—
75585	McCook	Madison WMD	12/20/2000	Ditch plug	Wildlife	11.4	#1 4.2 AF #2 7.2 AF
75583	McCook	Madison WMD	12/20/2000	Ditch plug	Wildlife	20.5	
75588	McCook	Madison WMD	12/20/2000	Ditch plug	Wildlife	8.6	#1 2.9 AF #2 3.2 AF #3 2.5 AF
75821	McCook	Madison WMD	07/11/2001	Ditch plug	Wildlife	14.2	#1 1.0 AF #2 2.1 AF #3 1.0 AF #4 2.5 AF #5 4.5 AF #6 3.1 AF
74803	McCook	Madison WMD	05/27/1998	Ditch	Wildlife	10	—
938	McCook	Madison WMD	09/05/1968	Dugout	Stock	0.8	—
75819	McCook	Madison WMD	01/16/2002	Ditch plug	Wildlife	5	#1 2.6 AF #2 2.4 AF
149	McCook	Madison WMD	11/13/1956	Dugout	Stock	1	—
73218	McCook	Madison WMD	09/14/1992	Dam/Ditch	Stock	4.3	—
23645	McCook	Madison WMD	10/27/1961	Dry Draw	Stock	1.1	—
76480	Miner	Madison WMD	11/16/2004	Dam	Fish and wildlife	6.7	#1 2.1 AF #2 3.2 AF #3 1.4 AF
72813	Miner	Madison WMD	06/01/1991	Dugout	Stock	22	—
72812	Miner	Madison WMD	06/01/1991	Dugout	Stock	20.2	—
75003	Miner	Madison WMD	06/15/1999	Ditch	Wildlife	14	#1 8.5 AF #2 1.7 AF #3 3.8 AF
76485	Miner	Madison WMD	10/06/2004	Dam	Fish and wildlife	11.7	#1 4.1 AF #2 1.2 AF #3 1.7 AF #4 3.0 AF #5 1.7 AF
76484	Miner	Madison WMD	12/21/2004	Dam	Fish and wildlife	2.3	#1 1.5 AF #2 0.8 AF
75063	Miner	Madison WMD	07/13/1999	Ditch	Wildlife	3.1	#1 1.3 AF #2 1.8 AF

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76482	Miner	Madison WMD	11/16/2004	Dam	Fish and wildlife	10.3	#1 4.8 AF #2 1.4 AF #3 0.9 AF #4 3.2 AF
75002	Miner	Madison WMD	06/15/1999	Ditch	Wildlife	14.2	#1 2.4 AF #2 2.0 AF #3 9.8 AF
76481	Miner	Madison WMD	11/16/2004	Dam	Fish and wildlife	23.1	#1 20.1 AF #2 3.0 AF
76483	Miner	Madison WMD	11/16/2004	Dam	Fish and wildlife	1.1	—
75059	Miner	Madison WMD	07/13/1999	Ditch	Wildlife	8.3	#1 1.7 AF #2 1.8 AF #3 1.7 AF #4 1.7 AF #5 0.6 AF #6 0.8 AF
76335	Miner	Hein WPA	05/03/2004	Ditch plug	Wildlife	14.5	#1 2.3 AF #2 12.2 AF
76017	Miner	Madison WMD	04/01/2002	Ditch plug	Wildlife	2.6	#1 0.8 AF #2 0.4 AF #3 1.4 AF
76016	Miner	Madison WMD	05/09/2002	Ditch plug	Wildlife	18.7	#1 1.2 AF #2 3.0 AF #3 0.6 AF #4 1.6 AF #5 12.3 AF
76324	Miner	Madison WMD	08/24/2004	Dam	Fish and wildlife	2.6	#1 2.3 AF #2 0.3 AF
76316	Miner	Madison WMD	08/02/2004	Dam	Fish and wildlife	8.5	#1 7.5 AF #2 1.0 AF
75807	Miner	Madison WMD	07/11/2001	Ditch plug	Wildlife	1.5	—
76314	Miner	Madison WMD	08/02/2004	Dam	Fish and wildlife	23.2	#1 2.6 AF #2 13.5 AF #3 1.4 AF #4 1.8 AF #5 3.9 AF
76313	Miner	Madison WMD	08/02/2004	Dam	Fish and wildlife	20.9	—
76018	Miner	Madison WMD	04/04/2002	Ditch plug	Wildlife	23.5	#1 5.2 AF #2 3.2 AF #3 2.2 AF #4 1.4 AF #5 1.4 AF #6 3.0 AF #7 3.8 AF #8 2.7 AF #9 0.6 AF
76336	Miner	Madison WMD	04/21/2004	Ditch plug	Wildlife	13.9	#1 2.7 AF #2 2.9 AF #3 8.3 AF
76311	Miner	Madison WMD	08/02/2004	Dam	Fish and wildlife	1.2	—
76334	Miner	Madison WMD	05/03/2004	Ditch plug	Wildlife	8	#1 2.3 AF #2 3.5 AF #3 1.0 AF #4 1.2 AF

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76333	Miner	Madison WMD	04/05/2004	Ditch plug	Wildlife	9.2	#1 5.3 AF #2 3.9 AF
76326	Miner	Madison WMD	08/24/2004	Dam	Fish and wildlife	6.5	—
76325	Miner	Madison WMD	08/24/2004	Dam	Fish and wildlife	15.5	#1 8.7AF #2 6.8 AF
76322	Miner	Madison WMD	08/24/2004	Dam	Fish and wildlife	2.3	—
76317	Miner	Madison WMD	08/02/2004	Dam	Fish and wildlife	15.4	#1 3.6 AF #2 10.8 AF #3 1.0 AF
76312	Miner	Madison WMD	08/02/2004	Dam	Fish and wildlife	10.9	#1 1.0 AF #2 4.5 AF #3 1.8 AF #4 2.4 AF #5 1.2 AF
76328	Miner	Madison WMD	08/11/2004	Dam	Fish and wildlife	12	—
75144	Miner	Madison WMD	08/11/1999	Ditch	Wildlife	6.9	#1 4.1 AF #2 1.5 AF #3 1.3 AF
74804	Miner	Madison WMD	05/27/1998	Ditch	Wildlife	8	—
75062	Miner	Madison WMD	08/02/1999	Ditch	Wildlife	5.1	#1 1.2 AF #2 1.4 AF #3 1.4 AF #4 1.1 AF
76315	Miner	Madison WMD	08/02/2004	Dam	Fish and wildlife	2	—
75143	Miner	Madison WMD	08/11/1999	Ditch	Wildlife	16.5	#1 4.5 AF #2 9.8 AF #3 1.0 AF #4 1.2 AF
76015	Miner	Madison WMD	05/09/2002	Ditch plug	Wildlife	8.4	#1 0.8 AF #2 0.8 AF #3 2.0 AF #4 2.8 AF #5 0.8 AF #6 1.2 AF
75145	Miner	Madison WMD	08/11/1999	Ditch	Wildlife	8.1	#1 3.5 AF #2 4.6 AF
75065	Miner	Madison WMD	08/11/1999	Ditch	Wildlife	4.5	—
75806	Miner	Madison WMD	07/11/2001	Ditch plug	Wildlife	12.6	#1 3.5 AF #2 1.5 AF #3 1.8 AF #4 1.2 AF #5 4.6 AF
76021	Miner	Madison WMD	04/01/2002	Ditch plug	Wildlife	7	—
76024	Miner	Madison WMD	04/01/2002	Ditch plug	Wildlife	14.4	#1 2.0 AF #2 0.8 AF #3 1.0 AF #4 2.0 AF #5 3.6 AF #6 5.0 AF
76022	Miner	Madison WMD	04/01/2002	Ditch plug	Wildlife	4.8	#1 1.2 AF #2 1.7 AF #3 1.9 AF

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76023	Miner	Madison WMD	04/01/2002	Ditch plug	Wildlife	11	#1 1.6 AF #2 3.0 AF #3 2.6 AF #4 1.0 AF #5 2.8 AF
75066	Miner	Madison WMD	08/11/1999	Ditch	Wildlife	14.7	#1 3.2 AF #2 2.2 AF #3 3.5 AF #4 1.2 AF #5 4.6 AF
76922	Miner	Madison WMD	05/26/2010	Dam	Fish and wildlife	24	—
75379	Miner	Madison WMD	06/19/2000	Ditch plug	Wildlife	15.8	#1 5.2 AF #2 2.5 AF #3 5.8 AF #4 2.3 AF
74327	Miner	Madison WMD	04/26/1996	Ditch plug	Wildlife	7	—
74326	Miner	Madison WMD	04/26/1996	Ditch plug	Wildlife	5	—
74573	Miner	Madison WMD	05/27/1997	Ditch plug	Wildlife	2	—
74180	Miner	Madison WMD	08/23/1995	Ditch plug	Wildlife	6.5	—
75582	Miner	Madison WMD	12/21/2000	Ditch plug	Wildlife	14.6	#1 1.0 AF #2 7.4 AF #3 1.4 AF #4 0.8 AF #5 1.2 AF #6 2.8 AF
75190	Miner	Madison WMD	10/13/1999	Ditch plug	Wildlife	5.9	#1 1.8 AF #2 4.1 AF
74736	Miner	Madison WMD	5/27/1998	Ditch plug	Wildlife	5	—
75228	Miner	Madison WMD	10/19/1999	Ditch plug	Wildlife	12.9	#1 1.9 AF #2 1.2 AF #3 4.2 AF #4 1.8 AF #5 2.1 AF #6 1.7 AF
75291	Miner	Madison WMD	07/29/1999	Ditch plug	Wildlife	24.4	#1 3.8 AF #2 8.5 AF #3 5.4 AF #4 6.7 AF
74181	Miner	Madison WMD	08/21/1995	Ditch plug	Wildlife	17.3	#1 10.0 AF #2 5.3 AF #3 2.0 AF
76923	Miner	Madison WMD	08/19/2009	Dam	Fish and wildlife	6.2	—
73221	Minnehaha	Madison WMD	09/14/1992	Dugout	Stock	7.5	—
75015	Minnehaha	Madison WMD	05/07/1999	Ditch	Wildlife	14.5	—
74808	Minnehaha	Madison WMD	08/28/1998	Ditch	Wildlife	4.3	#1 1.8 AF #2 1.0 AF #3 1.5 AF
72816	Minnehaha	Madison WMD	12/24/1991	Dugout	Stock	1.5	—
72817	Minnehaha	Madison WMD	12/24/1991	Dam	Fish and wildlife	20.25	—
75796	Minnehaha	Madison WMD	10/15/2001	Ditch plug	Wildlife	8	#1 4.0 AF #2 2.0 AF #3 2.0 AF

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76505	Minnehaha	Kindt/Munce WPA	08/15/2005	Dam	Fish and wildlife	10	—
59109	Moody	Madison WMD	09/18/1974	Dry draw	Stock	2	—
76330	Moody	Madison WMD	08/08/2003	Ditch plug	Wildlife	3.8	#1 2.8 AF #2 1.0 AF
74516	Moody	Madison WMD	10/31/1996	Dam/ditch	Wildlife	9.9	—
74476	Moody	Fannie Anderson WPA	09/28/1996	Dam	Wildlife	4.5	—
774	Moody	Madison WMD	09/08/1975	Dugout	Stock	2	—
34284	Moody	Madison WMD	07/14/1965	Dry draw	Stock	1	—
57878	Moody	Madison WMD	07/19/1974	Dry draw	Stock	2	—
74477	Moody	Fannie Anderson WPA	09/22/1996	Dam	Wildlife	18.7	—
76331	Moody	Madison WMD	08/25/2003	Ditch plug	Wildlife	7.6	#1 4.2 AF #2 2.3 AF #3 0.5 AF #4 0.6 AF
73016	Moody	Madison WMD	07/07/1992	Ditch plug	Fish and wildlife	24	—
717	Moody	Madison WMD	11/12/1974	Dugout	Stock	2	—
136	Moody	Madison WMD	10/31/1958	Dugout	Stock	2.5	—
389	Moody	Madison WMD	08/29/1966	Dugout	Stock	2	—
76126	Moody	Madison WMD	04/7/2003	Ditch plug	Wildlife	22.2	#1 12.0 AF #2 1.5 AF #3 6.3 AF #4 2.4 AF
76127	Moody	Madison WMD	04/7/2003	Ditch plug	Wildlife	18.4	#1 3.5 AF #2 6.6 AF #3 2.8 AF #4 3.0 AF #5 2.5 AF
76129	Moody	Madison WMD	04/7/2003	Ditch plug	Wildlife	22.2	#1 15.7 AF #2 1.9 AF #3 4.6 AF
490	Moody	Madison WMD	6/6/1968	Dugout	Stock	2	—
76130	Moody	Madison WMD	4/7/2003	Ditch plug	Wildlife	22.2	#1 2.2 AF #2 1.8 AF #3 3.6 AF #4 3.3 AF #5 1.9 AF #6 1.9 AF #7 1.8 AF #8 2.5 AF #9 3.2 AF
74763	Moody	Madison WMD	07/27/1998	Ditch plug	Wildlife	5.6	#1 4.2 AF #2 0.4 AF #3 1.0 AF
74762	Moody	Madison WMD	07/27/1998	Ditch plug	Wildlife	16.1	#1 13 AF #2 1.5 AF #3 0.9 AF #4 0.7 AF
74468	Moody	Madison WMD	09/29/1996	Ditch plug	Wildlife	3	—
74117	Moody	Madison WMD	07/01/1994	Dam	Wildlife	1.8	#1 1.2 AF #2 0.6 AF
76743	Moody	Madison WMD	10/18/2006	Dam	Wildlife	3.4	—

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74475	Moody	Madison WMD	09/21/1996	Ditch plug	Wildlife	20	#1 0.25 AF #2 0.50 AF #3 0.25 AF #4 1.5 AF #5 0.25 AF #6 16 AF #7 0.25 AF #8 0.25 AF #9 0.75 AF

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5922-3	Brown	Sand Lake WMD	07/15/1954	Dugout	Stock	1.1	—
69151	Brown	Sand Lake WMD	11/06/1981	Dugout	Stock	1.3	—
3065	Brown	Sand Lake WMD	06/06/1956	Dugout	Stock	1.16	—
312-1664	Brown	Sand Lake WMD	07/22/1974	Dugout	Stock	0.8	—
15559	Brown	Sand Lake WMD	09/01/1959	Dugout	Stock	1.5	—
52813	Brown	Sand Lake WMD	10/08/1971	Dugout	Stock	1.1	—
36845	Brown	Sand Lake WMD	06/27/1966	Dam	Stock	1.5	—
47469	Brown	Sand Lake WMD	09/02/1969	Dugout	Stock	1.1	—
74285	Brown	Sand Lake WMD	04/20/1995	Dam	Wildlife	8	—
73088	Brown	Sand Lake WMD	08/04/1992	Dugout	Stock and wildlife	1	—
73089	Brown	Sand Lake WMD	08/04/1992	Dugout	Wildlife	1	—
73180	Brown	Sand Lake WMD	08/4/1992	Dugout	Stock and wildlife	1	—
73185	Brown	Sand Lake WMD	08/04/1992	Dugout	Wildlife	1	—
76-456	Edmunds	Sand Lake WMD	12/06/1976	Dugout	Stock	1.8	—
74-397	Edmunds	Sand Lake WMD	09/11/1974	Dugout	Stock	1.25	—
67-485	Edmunds	Sand Lake WMD	11/10/1967	Dugout	Stock	0.9	—
70-443	Edmunds	Sand Lake WMD	09/02/1970	Dugout	Stock	1.25	—
80-430	Edmunds	Sand Lake WMD	09/24/1980	Dugout	Stock	1.4	—
42628	Edmunds	Sand Lake WMD	10/23/1957	Dugout	Stock	0.8	—
25250	Edmunds	Sand Lake WMD	09/10/1962	Dugout	Stock	1.8	—
39764	Edmunds	Sand Lake WMD	07/27/1956	Dugout	Stock	1.2	—
45199	Edmunds	Sand Lake WMD	10/13/1958	Dugout	Stock	1.2	—
42683	Edmunds	Sand Lake WMD	10/31/1957	Dugout	Stock	0.6	—
39806	Edmunds	Sand Lake WMD	08/08/1956	Dugout	Stock	1.2	—
28713	Edmunds	Sand Lake WMD	11/19/1951	Dam	Stock	0.3	—
59146	Edmunds	Sand Lake WMD	08/22/1966	Dugout	Stock	1.5	—
71-183	Edmunds	Sand Lake WMD	04/21/1971	Dugout	Stock	1.3	—
67-458	Edmunds	Sand Lake WMD	11/06/1967	Dugout	Stock	1.2	—
52455	Edmunds	Sand Lake WMD	07/16/1962	Dugout	Stock	1.53	—
55520	Edmunds	Sand Lake WMD	09/14/1964	Dugout	Stock	1.5	—
34113	Edmunds	Sand Lake WMD	03/27/1954	Dugout	Stock	1.7	—
70-442	Edmunds	Sand Lake WMD	09/02/1970	Dugout	Stock	1.25	—

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41819	Edmunds	Sand Lake WMD	07/31/1957	Dugout	Stock	1.5	—
71-723	Edmunds	Sand Lake WMD	12/21/1971	Dugout	Stock	1.2	—
29726	Edmunds	Sand Lake WMD	08/29/1952	Dam	Stock	1.9	—
75-429	Edmunds	Sand Lake WMD	10/27/1975	Dugout	Stock	1.25	—
80-376	Edmunds	Sand Lake WMD	09/02/1980	Dugout	Stock	1.8	—
59207	Edmunds	Sand Lake WMD	09/13/1966	Dugout	Stock	1.4	—
28009	Edmunds	Sand Lake WMD	10/22/1951	Dugout	Stock	1.9	—
56721	Edmunds	Sand Lake WMD	07/02/1965	Dugout	Stock	1.5	—
73-551	Edmunds	Sand Lake WMD	11/08/1973	Dugout	Stock	1.3	—
56954	Edmunds	Sand Lake WMD	09/07/1965	Dugout	Stock	1.8	—
74-189	Edmunds	Sand Lake WMD	05/06/1974	Dugout	Stock	1.25	—
69-471	Edmunds	Sand Lake WMD	10/03/1969	Dugout	Stock	1.3	—
40424	Edmunds	Sand Lake WMD	11/20/1956	Dugout	Stock	1.2	—
74384	Edmunds	Sand Lake WMD	08/05/1996	Dam	Wildlife	10	—
74383	Edmunds	Sand Lake WMD	08/05/1996	Dam	Wildlife	10	—
73401	Edmunds	Sand Lake WMD	09/23/1992	Dugout	Stock and wildlife	0.15	—
73400	Edmunds	Sand Lake WMD	09/23/1992	Dugout	Stock	0.9	—
B-2345	Faulk	Sand Lake WMD	07/08/1958	Dugout	Stock	0.6	—
73492	McPherson	Sand Lake WMD	06/01/1993	Dam	Wildlife	15	—
73491	McPherson	Sand Lake WMD	06/02/1993	Dam	Wildlife	13.5	—
70272	McPherson	Sand Lake WMD	09/10/1984	Dry draw dam	Storage	1	—
70063	McPherson	Sand Lake WMD	11/02/1983	Dry draw dam	Storage	1.1	—
69995	McPherson	Sand Lake WMD	09/29/1983	Dry draw dam	Storage	1	—
112	McPherson	Sand Lake WMD	08/09/1967	Dugout	Stock	1.1	—
105266	McPherson	Sand Lake WMD	12/16/1959	Dugout	Stock	1.2	—
107665	McPherson	Sand Lake WMD	11/27/1961	Dugout	Stock	1.3	—
285	McPherson	Sand Lake WMD	10/09/1967	Dugout	Stock	1.2	—
2566	McPherson	Sand Lake WMD	12/30/1971	Dugout	Stock	1.1	—
112333	McPherson	Sand Lake WMD	12/28/1965	Dugout	Stock	1.5	—
105959	McPherson	Sand Lake WMD	08/11/1960	Dugout	Stock	1.8	—
1079	McPherson	Sand Lake WMD	09/17/1968	Dugout	Stock	1.5	—
109311	McPherson	Sand Lake WMD	05/21/1963	Dugout	Stock	1.3	—
4801	McPherson	Sand Lake WMD	07/27/1977	Dam	Stock	1.1	—
4392	McPherson	Sand Lake WMD	06/04/1976	Dam	Stock	1.1	—
4857	McPherson	Sand Lake WMD	09/12/1977	Dugout	Stock	1.1	—
105978	McPherson	Sand Lake WMD	08/19/1960	Dugout	Stock	1.2	—
110951	McPherson	Sand Lake WMD	11/02/1964	Dugout	Stock	1.8	—
104681	McPherson	Sand Lake WMD	07/08/1959	Dugout	Stock	1.2	—
1608	McPherson	Sand Lake WMD	10/31/1969	Dugout	Stock	1.0	—
63792	McPherson	Sand Lake WMD	08/05/1976	Dam	Stock	1.0	—
101611	McPherson	Sand Lake WMD	09/22/1957	Dugout	Stock	1.5	—
9889	McPherson	Sand Lake WMD	09/03/1958	Dugout	Stock	1.2	—
8294	McPherson	Sand Lake WMD	01/17/1986	Dugout	Stock	0.75	—
104699	McPherson	Sand Lake WMD	07/16/1959	Dugout	Stock	1.2	—

<i>Location notice no.</i>	<i>County</i>	<i>Area</i>	<i>Priority date</i>	<i>Structure type</i>	<i>Use</i>	<i>Storage acre-feet</i>	<i>Additional information</i>
6010	McPherson	Sand Lake WMD	06/02/1980	Dugout	Stock	0.9	—
3485	McPherson	Sand Lake WMD	10/05/1973	Dugout	Stock	0.9	—
101701	McPherson	Sand Lake WMD	10/14/1957	Dugout	Stock	1.25	—
108781	McPherson	Sand Lake WMD	12/05/1962	Dugout	Stock	1.28	—
101161	McPherson	Sand Lake WMD	07/08/1957	Dugout	Stock	1.25	—
106716	Potter	Sand Lake WMD	06/24/1976	Dugout	Stock	1.8	—
1669	Spink	Sand Lake WMD	12/15/1972	Dugout	Stock	1.1	—
57003	Spink	Sand Lake WMD	09/14/1981	Dugout	Stock	2.9	—
54068	Spink	Sand Lake WMD	07/22/1966	Dugout	Stock	1.5	—
56726	Spink	Sand Lake WMD	07/06/1976	Dam	Stock	1.5	—



# Appendix F

## *South Dakota Upland Plant Associations*

- Updated July 27, 2009.
- Record 1 of below types.
- Based on Daubenmire dominant canopy cover.
- These categories are designed for monitoring plant community composition of native sod, planted natives, and DNC.
- Revised from Grant et al. 2004, Hegstad 1973.
- Document robust patches of native forbs >50% with category 25 (i.e., lead plant, goldenrod, etc.). Alternatively, category 75 (other weeds) can be used to document weed patches that typically dominate disturbed sites.
- Litter is not a category in itself, therefore assign litter to category it applies to (e.g., Kentucky bluegrass litter = 31).
- In the event of an apparent equal mix of Kentucky bluegrass and smooth brome—consider as code 41.
- Prairie rose and leadplant are considered native forbs with respect to these categories.

### F.1 Shrub And Tree Types

#### LOW SHRUB

(generally 1.5–4.5 feet tall, e.g., western snowberry)

- 11 dense low shrub, other plants few or none
- 12 low shrub, remainder native grass and forb
- 13 low shrub, remainder Kentucky bluegrass
- 14 low shrub, remainder brome or quackgrass
- 19 low shrub, remainder crested

#### TALL SHRUB

(generally 4.5–15 feet tall)

- 15 tall shrub, native
- 16 tall shrub, exotic

#### TREES

- 17 native trees (e.g. cottonwood, green ash, bur oak)
- 18 nonnative trees (e.g. Japanese elm, Russian olive)

### F.2 Native Grass-Forb Types<sup>a</sup>

- 21 cool-season grasses and forbs: (A) green needle, (B) western wheatgrass, (C) porcupine grass

- 22 warm-season grasses and forbs: (A) big bluestem, (B) switch, (C) Indian, (D) little bluestem
- 23 meadow (sedges, baltic rush, dock, smartweed, cordgrass, reedgrass, horsetail, foxtail barley, etc.)
- 24 wetland; robust emergent vegetation or open water (cattail, river bulrush, bur-reed, *Phragmites*, manna grass)
- 25 forb

### F.3 Introduced, Invasive, or Plants of Management Concern

- 31 Kentucky bluegrass dominant
- 41 smooth brome dominant
- 51 crested wheatgrass dominant
- 52 quackgrass
- 53 reed canarygrass
- 61 tall, intermediate, or pubescent wheatgrass
- 62 other nonnative grass—user defined (downy/Japanese brome, etc.)

### F.4 Noxious and Other Weed Types

- 71 leafy spurge
- 72 Canada thistle
- 73 sow thistle
- 74 wormwoods
- 75 other weeds (kochia, ragweed, cocklebur, etc.)
- 76 other noxious weed (user-defined)

### F.5 Other

- 81 tall introduced legume (sweet clover or alfalfa)
- 83 cactus
- 84 clubmoss/lichen
- 91 barren, unvegetated (bare soil, gopher mound)
- 92 other (rock, manure, hole, ant hill)

<sup>a</sup> *Optional Species Modifier: Document dominant native grass species using the respective letter*



# Appendix G

## *South Dakota Species*

### BIRDS<sup>1</sup>

<i>Common name</i>	<i>Scientific name</i>
<b>Loons</b>	
Common Loon	<i>Gavia immer</i>
<b>Grebes</b>	
Pied-billed Grebe	<i>Podilymbus podiceps</i>
Horned Grebe <sup>2</sup>	<i>Podiceps auritus</i>
Red-necked Grebe	<i>Podiceps grisegena</i>
Eared Grebe	<i>Podiceps nigricollis</i>
Western Grebe	<i>Aechmophorus occidentalis</i>
<b>Pelicans</b>	
American White Pelican	<i>Pelecanus erythrorhynchos</i>
<b>Cormorants</b>	
Double-crested Cormorant	<i>Phalacrocorax auritus</i>
<b>Hérons and Bitterns</b>	
American Bittern <sup>2</sup>	<i>Botaurus lentiginosus</i>
Least Bittern <sup>2</sup>	<i>Ixobrychus exilis</i>
Great Blue Heron	<i>Ardea herodias</i>
Great Egret	<i>Ardea alba</i>
Snowy Egret	<i>Egretta thula</i>
Cattle Egret	<i>Bubulcus ibis</i>
Green Heron	<i>Butorides virescens</i>
Black-crowned Night-Heron	<i>Nycticorax nycticorax</i>
<b>Ibises</b>	
White-faced Ibis	<i>Plegadis chihi</i>
<b>Vultures</b>	
Turkey Vulture	<i>Cathartes aura</i>
<b>Swans, Geese, and Ducks</b>	
Greater White-fronted Goose	<i>Anser albifrons</i>
Snow Goose	<i>Chen caerulescens</i>
Ross' Goose	<i>Chen rossii</i>
Canada Goose	<i>Branta canadensis</i>
Tundra Swan	<i>Cygnus columbianus</i>
Wood Duck	<i>Aix sponsa</i>
Gadwall	<i>Anas strepera</i>
American Wigeon	<i>Anas americana</i>
Mallard	<i>Anas platyrhynchos</i>
Blue-winged Teal	<i>Anas discors</i>
Northern Shoveler	<i>Anas clypeata</i>
Northern Pintail	<i>Anas acuta</i>

<i>Common name</i>	<i>Scientific name</i>
Green-winged Teal	<i>Anas crecca</i>
Canvasback	<i>Aythya valisineria</i>
Redhead	<i>Aythya americana</i>
Ring-necked Duck	<i>Aythya collaris</i>
Greater Scaup	<i>Aythya marila</i>
Lesser Scaup	<i>Aythya affinis</i>
Bufflehead	<i>Bucephala albeola</i>
Common Goldeneye	<i>Bucephala clangula</i>
Hooded Merganser	<i>Lophodytes cucullatus</i>
Common Merganser	<i>Mergus merganser</i>
Red-breasted Merganser	<i>Mergus serrator</i>
Ruddy Duck	<i>Oxyura jamaicensis</i>
<b>Kites, Eagles, and Hawks</b>	
Osprey	<i>Pandion haliaetus</i>
Bald Eagle <sup>2</sup>	<i>Haliaeetus leucocephalus</i>
Northern Harrier	<i>Circus cyaneus</i>
Sharp-shinned Hawk	<i>Accipiter striatus</i>
Cooper's Hawk	<i>Accipiter cooperii</i>
Northern Goshawk	<i>Accipiter gentilis</i>
Broad-winged Hawk	<i>Buteo platypterus</i>
Swainson's Hawk <sup>2</sup>	<i>Buteo swainsoni</i>
Red-tailed Hawk	<i>Buteo jamaicensis</i>
Ferruginous Hawk	<i>Buteo regalis</i>
Rough-legged Hawk	<i>Buteo lagopus</i>
Golden Eagle	<i>Aquila chrysaetos</i>
<b>Falcons</b>	
American Kestrel	<i>Falco sparverius</i>
Merlin	<i>Falco columbarius</i>
Peregrine Falcon <sup>2</sup>	<i>Falco peregrinus</i>
Prairie Falcon	<i>Falco mexicanus</i>
<b>Partridge, Pheasant, Grouse, Turkey, and Quail</b>	
Gray Partridge (Introduced)	<i>Perdix perdix</i>
Ring-necked Pheasant (Introduced)	<i>Phasianus colchicus</i>
Sharp-tailed Grouse	<i>Tympanuchus phasianellus</i>
Greater Prairie-Chicken	<i>Tympanuchus cupido</i>
Wild Turkey	<i>Meleagris gallopavo</i>
<b>Rails, Gallinules, and Coots</b>	
Virginia Rail	<i>Rallus limicola</i>
Sora	<i>Porzana carolina</i>
American Coot	<i>Fulica americana</i>
<b>Cranes</b>	
Sandhill Crane	<i>Grus canadensis</i>
Whooping Crane	<i>Grus americana</i>
<b>Plovers</b>	
Black-bellied Plover	<i>Pluvialis squatarola</i>
American Golden-Plover	<i>Pluvialis dominica</i>

<i>Common name</i>	<i>Scientific name</i>
Semipalmated Plover	<i>Charadrius semipalmatus</i>
Piping Plover	<i>Charadrius melodus</i>
Killdeer	<i>Charadrius vociferus</i>
<b>Stilts and Avocets</b>	
American Avocet	<i>Recurvirostra americana</i>
<b>Sandpipers and Phalaropes</b>	
Greater Yellowlegs	<i>Tringa melanoleuca</i>
Lesser Yellowlegs	<i>Tringa flavipes</i>
Solitary Sandpiper	<i>Tringa solitaria</i>
Willet	<i>Catoptrophorus semipalmatus</i>
Spotted Sandpiper	<i>Actitis macularia</i>
Upland Sandpiper <sup>2</sup>	<i>Bartramia longicauda</i>
Long-billed Curlew <sup>2</sup>	<i>Numenius americanus</i>
Hudsonian Godwit	<i>Limosa haemastica</i>
Marbled Godwit <sup>2</sup>	<i>Limosa fedoa</i>
Ruddy Turnstone	<i>Arenaria interpres</i>
Sanderling	<i>Calidris alba</i>
Semipalmated Sandpiper	<i>Calidris pusilla</i>
Least Sandpiper	<i>Calidris minutilla</i>
White-rumped Sandpiper	<i>Calidris fuscicollis</i>
Baird's Sandpiper	<i>Calidris bairdii</i>
Pectoral Sandpiper	<i>Calidris melanotos</i>
Dunlin	<i>Calidris alpina</i>
Stilt Sandpiper	<i>Calidris himantopus</i>
Short-billed Dowitcher	<i>Limnodromus griseus</i>
Long-billed Dowitcher	<i>Limnodromus scolopaceus</i>
Wilson's Snipe	<i>Gallinago delicata</i>
American Woodcock	<i>Scolopax minor</i>
Wilson's Phalarope	<i>Phalaropus tricolor</i>
Red-necked Phalarope	<i>Phalaropus lobatus</i>
<b>Jaegers, Gulls, and Terns</b>	
Franklin's Gull	<i>Larus pipixcan</i>
Bonaparte's Gull	<i>Larus philadelphia</i>
Ring-billed Gull	<i>Larus delawarensis</i>
Herring Gull	<i>Larus argentatus</i>
Common Tern	<i>Sterna hirundo</i>
Forster's Tern	<i>Sterna forsteri</i>
Least Tern	<i>Sterna antillarum</i>
Black Tern <sup>2</sup>	<i>Chlidonias niger</i>
<b>Pigeons and Doves</b>	
Rock Pigeon (Introduced)	<i>Columba livia</i>
Eurasian Collared-dove (Introduced)	<i>Streptopelia decaocto</i>
Mourning Dove	<i>Zenaida macroura</i>
<b>Cuckoos and Anis</b>	
Black-billed Cuckoo <sup>2</sup>	<i>Coccyzus erythrophthalmus</i>
Yellow-billed Cuckoo	<i>Coccyzus americanus</i>

<i>Common name</i>	<i>Scientific name</i>
<b>Typical Owls</b>	
Eastern Screech-Owl	<i>Otus asio</i>
Great Horned Owl	<i>Bubo virginianus</i>
Snowy Owl	<i>Nyctea scandiaca</i>
Burrowing Owl	<i>Athene cunicularia</i>
Long-eared Owl	<i>Asio otus</i>
Short-eared Owl <sup>2</sup>	<i>Asio flammeus</i>
<b>Goatsuckers</b>	
Common Nighthawk	<i>Chordeiles minor</i>
Whip-poor-will	<i>Caprimulgus vociferus</i>
<b>Swifts</b>	
Chimney Swift	<i>Chaetura pelagica</i>
<b>Hummingbirds</b>	
Ruby-throated Hummingbird	<i>Archilochus colubris</i>
<b>Kingfishers</b>	
Belted Kingfisher	<i>Ceryle alcyon</i>
<b>Woodpeckers</b>	
Red-headed Woodpecker <sup>2</sup>	<i>Melanerpes erythrocephalus</i>
Red-bellied Woodpecker	<i>Melanerpes carolinus</i>
Yellow-bellied Sapsucker	<i>Sphyrapicus varius</i>
Downy Woodpecker	<i>Picoides pubescens</i>
Hairy Woodpecker	<i>Picoides villosus</i>
Northern Flicker	<i>Colaptes auratus</i>
<b>Tyrant Flycatchers</b>	
Eastern Wood-Pewee	<i>Contopus virens</i>
Alder Flycatcher	<i>Empidonax alnorum</i>
Willow Flycatcher	<i>Empidonax traillii</i>
Least Flycatcher	<i>Empidonax minimus</i>
Eastern Phoebe	<i>Sayornis phoebe</i>
Great Crested Flycatcher	<i>Myiarchus crinitus</i>
Western Kingbird	<i>Tyrannus verticalis</i>
Eastern Kingbird	<i>Tyrannus tyrannus</i>
<b>Shrikes</b>	
Loggerhead Shrike	<i>Lanius ludovicianus</i>
Northern Shrike	<i>Lanius excubitor</i>
<b>Vireos</b>	
Yellow-throated Vireo	<i>Vireo flavifrons</i>
Blue-headed Vireo	<i>Vireo solitarius</i>
Warbling Vireo	<i>Vireo gilvus</i>
Red-eyed Vireo	<i>Vireo olivaceus</i>
<b>Jays, Magpies, and Crows</b>	
Blue Jay	<i>Cyanocitta cristata</i>
Black-billed Magpie	<i>Pica hudsonia</i>
American Crow	<i>Corvus brachyrhynchos</i>
<b>Larks</b>	
Horned Lark	<i>Eremophila alpestris</i>

<i>Common name</i>	<i>Scientific name</i>
<b>Swallows</b>	
Purple Martin	<i>Progne subis</i>
Tree Swallow	<i>Tachycineta bicolor</i>
Northern Rough-winged Swallow	<i>Stelgidopteryx serripennis</i>
Bank Swallow	<i>Riparia riparia</i>
Cliff Swallow	<i>Petrochelidon pyrrhonota</i>
Barn Swallow	<i>Hirundo rustica</i>
<b>Titmice</b>	
Black-capped Chickadee	<i>Poecile atricapilla</i>
<b>Nuthatches</b>	
Red-breasted Nuthatch	<i>Sitta canadensis</i>
White-breasted Nuthatch	<i>Sitta carolinensis</i>
<b>Creepers</b>	
Brown Creeper	<i>Certhia americana</i>
<b>Wrens</b>	
House Wren	<i>Troglodytes aedon</i>
Sedge Wren	<i>Cistothorus platensis</i>
Marsh Wren	<i>Cistothorus palustris</i>
<b>Kinglets</b>	
Golden-crowned Kinglet	<i>Regulus satrapa</i>
Ruby-crowned Kinglet	<i>Regulus calendula</i>
<b>Thrushes</b>	
Eastern Bluebird	<i>Sialia sialis</i>
Gray-cheeked Thrush	<i>Catharus minimus</i>
Swainson's Thrush	<i>Catharus ustulatus</i>
Hermit Thrush	<i>Catharus guttatus</i>
Wood Thrush	<i>Hylocichla mustelina</i>
American Robin	<i>Turdus migratorius</i>
<b>Mockingbirds and Thrashers</b>	
Gray Catbird	<i>Dumetella carolinensis</i>
Brown Thrasher	<i>Toxostoma rufum</i>
<b>Starlings</b>	
European Starling (Introduced)	<i>Sturnus vulgaris</i>
<b>Pipits</b>	
American Pipit	<i>Anthus rubescens</i>
Sprague's Pipit <sup>2</sup>	<i>Anthus spragueii</i>
<b>Waxwings</b>	
Bohemian Waxwing	<i>Bombycilla garrulus</i>
Cedar Waxwing	<i>Bombycilla cedrorum</i>

<i>Common name</i>	<i>Scientific name</i>
<b>Wood-Warblers</b>	
Tennessee Warbler	<i>Vermivora peregrina</i>
Orange-crowned Warbler	<i>Vermivora celata</i>
Nashville Warbler	<i>Vermivora ruficapilla</i>
Yellow Warbler	<i>Dendroica petechia</i>
Chestnut-sided Warbler	<i>Dendroica pensylvanica</i>
Magnolia Warbler	<i>Dendroica magnolia</i>
Yellow-rumped Warbler	<i>Dendroica coronata</i>
Black-throated Green Warbler	<i>Dendroica virens</i>
Blackburnian Warbler	<i>Dendroica fusca</i>
Palm Warbler	<i>Dendroica palmarum</i>
Bay-breasted Warbler	<i>Dendroica castanea</i>
Blackpoll Warbler	<i>Dendroica striata</i>
Black-and-white Warbler	<i>Mniotilta varia</i>
American Redstart	<i>Setophaga ruticilla</i>
Ovenbird	<i>Seiurus aurocapillus</i>
Northern Waterthrush	<i>Seiurus noveboracensis</i>
Mourning Warbler	<i>Oporornis philadelphia</i>
Common Yellowthroat	<i>Geothlypis trichas</i>
Wilson's Warbler	<i>Wilsonia pusilla</i>
Canada Warbler	<i>Wilsonia canadensis</i>
<b>Tanagers</b>	
Scarlet Tanager	<i>Piranga olivacea</i>
<b>Towhees, Sparrows, Juncos, and Longspurs</b>	
Spotted Towhee	<i>Pipilo maculatus</i>
Eastern Towhee	<i>Pipilo erythrophthalmus</i>
American Tree Sparrow	<i>Spizella arborea</i>
Chipping Sparrow	<i>Spizella passerina</i>
Clay-colored Sparrow	<i>Spizella pallida</i>
Field Sparrow	<i>Spizella pusilla</i>
Vesper Sparrow	<i>Pooecetes gramineus</i>
Lark Sparrow	<i>Chondestes grammacus</i>
Lark Bunting	<i>Calamospiza melanocorys</i>
Savannah Sparrow	<i>Passerculus sandwichensis</i>
Grasshopper Sparrow <sup>2</sup>	<i>Ammodramus savannarum</i>
Baird's Sparrow <sup>2</sup>	<i>Ammodramus bairdii</i>
Le Conte's Sparrow	<i>Ammodramus leconteii</i>
Fox Sparrow	<i>Passerelia iliaca</i>
Song Sparrow	<i>Melospiza melodia</i>
Lincoln's Sparrow	<i>Melospiza lincolni</i>
Swamp Sparrow	<i>Melospiza georgiana</i>
White-throated Sparrow	<i>Zonotrichia albicollis</i>
Harris' Sparrow	<i>Zonotrichia querula</i>
White-crowned Sparrow	<i>Zonotrichia leucophrys</i>
Dark-eyed Junco	<i>Junco hyemalis</i>
Lapland Longspur	<i>Calcarius lapponicus</i>

<i>Common name</i>	<i>Scientific name</i>
Chestnut-collared Longspur <sup>2</sup>	<i>Calcarius ornatus</i>
Snow Bunting	<i>Plectrophenax nivalis</i>
<b>Cardinals, Grosbeaks, and Buntings</b>	
Northern Cardinal	<i>Cardinalis cardinalis</i>
Rose-breasted Grosbeak	<i>Pheucticus ludovicianus</i>
Indigo Bunting	<i>Passerina cyanea</i>
Dickcissel <sup>2</sup>	<i>Spiza americana</i>
<b>Meadowlarks, Blackbirds, and Orioles</b>	
Bobolink	<i>Dolichonyx oryzivorus</i>
Red-winged Blackbird	<i>Agelaius phoeniceus</i>
Western Meadowlark	<i>Sturnella neglecta</i>
Yellow-headed Blackbird	<i>Xanthocephalus xanthocephalus</i>
Rusty Blackbird	<i>Euphagus carolinus</i>
Brewer's Blackbird	<i>Euphagus cyanocephalus</i>
Common Grackle	<i>Quiscalus quiscula</i>
Brown-headed Cowbird	<i>Molothrus ater</i>
Orchard Oriole	<i>Icterus spurius</i>
Baltimore Oriole	<i>Icterus galbula</i>
<b>Finches</b>	
Purple Finch	<i>Carpodacus purpureus</i>
House Finch	<i>Carpodacus mexicanus</i>
Red Crossbill	<i>Loxia curvirostra</i>
White-winged Crossbill	<i>Loxia leucoptera</i>
Common Redpoll	<i>Carduelis flammea</i>
Pine Siskin	<i>Carduelis pinus</i>
American Goldfinch	<i>Carduelis tristis</i>
Evening Grosbeak	<i>Coccothraustes vespertinus</i>
<b>Old World Sparrows</b>	
House Sparrow (Introduced)	<i>Passer domesticus</i>

<sup>1</sup> This list based on “The Birds of South Dakota” (Tallman et al. 2002) and “Checklist of North American Birds” (AOU 1998) and limited to species classified as Common (>25 individuals a day could be seen by a single observer in appropriate habitat) and Uncommon (<25 individuals a day could be seen by a single observer in appropriate habitat). Species classified as Rare (average fewer than 6 observations state or region-wide per season), Casual (out of normal range [3–10 records statewide in past 10 years]), or Accidental (far from normal range [0–2 records statewide in past 10 years]) are not listed.

<sup>2</sup> Birds of Conservation Concern (breeding) in the Prairie Potholes Bird Conservation Region (USFWS 2008a).

**MAMMALS<sup>1</sup>**

<i>Common name</i>	<i>Scientific name</i>
<b>Opossums</b>	
Virginia Opossum	<i>Didelphis virginiana</i>
<b>Insectivores</b>	
<b>Shrews</b>	
Cinereus or Masked Shrew	<i>Sorex cinereus</i>
Northern Short-tailed Shrew	<i>Blarina brevicauda</i>
Arctic Shrew	<i>Sorex arcticus</i>
Hayden's Shrew	<i>Sorex haydeni</i>
Dwarf Shrew	<i>Sorex nanus</i>
Pygmy Shrew	<i>Sorex hoyi</i>
<b>Moles</b>	
Eastern Mole	<i>Scalopus aquaticus</i>
<b>Bats</b>	
<b>Vespertilionid Bats</b>	
Little Brown Myotis	<i>Myotis lucifugus</i>
Northern Myotis	<i>Myotis septentrionalis</i>
Eastern Red Bat	<i>Lasiurus borealis</i>
Hoary Bat	<i>Lasiurus cinereus</i>
Silver-haired Bat	<i>Lasionycteris noctivagans</i>
Big Brown Bat	<i>Eptesicus fuscus</i>
<b>Lagomorphs</b>	
<b>Hares and Rabbits</b>	
Eastern Cottontail	<i>Sylvilagus floridanus</i>
White-tailed Jackrabbit	<i>Lepus townsendii</i>
<b>Rodents</b>	
<b>Squirrels</b>	
Woodchuck	<i>Marmota monax</i>
Franklin's Ground Squirrel	<i>Spermophilus franklinii</i>
Richardson's Ground Squirrel	<i>Spermophilus richardsonii</i>
Thirteen-lined Ground Squirrel	<i>Spermophilus tridecemlineatus</i>
Black-Tailed Prairie Dog	<i>Cynomys ludovicianus</i>
Eastern Gray Squirrel	<i>Sciurus carolinensis</i>
Eastern Fox Squirrel	<i>Sciurus niger</i>
<b>Pocket Gophers</b>	
Northern Pocket Gopher	<i>Thomomys talpoides</i>
Plains Pocket Gopher	<i>Geomys bursarius</i>
<b>Heteromyids</b>	
Plains Pocket Mouse	<i>Perognathus flavescens</i>
Olive-Backed Pocket Mouse	<i>Perognathus fasciatus</i>
Hispid Pocket Mouse	<i>Chaetodipus hispidus</i>
<b>Beavers</b>	
American Beaver	<i>Castor canadensis</i>
<b>Mice, Rats, and Voles</b>	
Western Harvest Mouse	<i>Reithrodontomys megalotis</i>
White-footed Mouse	<i>Peromyscus leucopus</i>

<i>Common name</i>	<i>Scientific name</i>
Deer Mouse	<i>Peromyscus maniculatus</i>
Northern Grasshopper Mouse	<i>Onychomys leucogaster</i>
Norway Rat	<i>Rattus norvegicus</i>
House Mouse	<i>Mus musculus</i>
Southern Red-backed Vole	<i>Clethrionomys gapperi</i>
Prairie Vole	<i>Microtus ochrogaster</i>
Meadow Vole	<i>Microtus pennsylvanicus</i>
Common Muskrat	<i>Ondatra zibethicus</i>
<b>Jumping Mice</b>	
Meadow Jumping Mouse	<i>Zapus hudsonius</i>
<b>New World Porcupines</b>	
Common Porcupine	<i>Erethizon dorsatum</i>
<b>Carnivores</b>	
<b>Canids</b>	
Coyote	<i>Canis latrans</i>
Red Fox	<i>Vulpes vulpes</i>
Common Gray Fox	<i>Urocyon cinereoargenteus</i>
<b>Procyonids</b>	
Common Raccoon	<i>Procyon lotor</i>
<b>Mustelids</b>	
Ermine	<i>Mustela erminea</i>
Long-tailed Weasel	<i>Mustela frenata</i>
Least Weasel	<i>Mustela nivalis</i>
American Mink	<i>Mustela vison</i>
American Badger	<i>Taxidea taxus</i>
<b>Mephitids</b>	
Eastern Spotted Skunk	<i>Spilogale putorius</i>
Striped Skunk	<i>Mephitis mephitis</i>
<b>Cats</b>	
Bobcat	<i>Felis rufus</i>
<b>Ungulates</b>	
<b>Cervids</b>	
Mule or Black-tailed Deer	<i>Odocoileus hemionus</i>
White-tailed Deer	<i>Odocoileus virginianus</i>
<b>Antelope Caprids</b>	
Pronghorn	<i>Antilocapra americana</i>
<b>Bovids</b>	
Domestic cattle	<i>Bos taurus</i>

<sup>1</sup> This list is based on the reference “Wild Mammals of South Dakota” (Higgins et al. 2000) along with staff observations

**AMPHIBIANS AND REPTILES<sup>1</sup>**

<i>Common name</i>	<i>Scientific name</i>
<b>Salamanders</b>	
Tiger Salamander	<i>Ambystoma tigrinum</i>
<b>Frogs and Toads</b>	
Plains Spadefoot	<i>Spea bombifrons</i>
Boreal Chorus Frog	<i>Pseudacris maculata</i>
Northern Leopard Frog	<i>Rana pipiens</i>
Woodhouse's Toad	<i>Bufo woodhousei</i>
American Toad	<i>Bufo americanus</i>
Canadian Toad	<i>Bufo hemiophrys</i>
Great Plains Toad	<i>Bufo cognatus</i>
<b>Turtles</b>	
Western Painted Turtle	<i>Chrysemys picta bellii</i>
Snapping Turtle	<i>Chelydra serpentina</i>
Spiny Soft Shelled Turtle	<i>Trionyx spiniferus</i>
<b>Skinks</b>	
Prairie Skink	<i>Eumeces septentrionalis</i>
<b>Snakes</b>	
Racer	<i>Coluber constrictor</i>
Gophersnake	<i>Pituophis catenifer</i>
Eastern Garter Snake	<i>Thamnophis sirtalis sirtalis</i>
Plains Garter Snake	<i>Thamnophis radix</i>
Smooth Green Snake	<i>Ophedryx vernalis</i>
Western Hognose Snake	<i>Heterodon nasicus</i>
Bullsnake	<i>Pituophis melanoleucus</i>
Redbelly Snake	<i>Storeria occipitomaculata</i>
Common Garter Snake	<i>Thamnophis sirtalis</i>
Prairie Rattlesnake	<i>Crotalus viridis</i>

<sup>1</sup> This list is based on the reference "Field Guide to Amphibians and Reptiles of South Dakota" (Kiesow 2006) along with staff observations.

**FISH<sup>1</sup>**

<i>Common name</i>	<i>Scientific name</i>
Logperch	<i>Percina caprodes</i>
Flathead Catfish	<i>Pylodictis olivaris</i>
Lake Trout	<i>Salvelinus namaycush</i>
Black Bullhead	<i>Ameiurus melas</i>
Yellow Bullhead	<i>Ameiurus natalis</i>
Stonecat	<i>Noturus flavus</i>
Channel Catfish	<i>Ictalurus punctatus</i>
Common Carp	<i>Cyprinus carpio</i>
White Sucker	<i>Catostomus commersoni</i>
Bigmouth Buffalo	<i>Ictiobus cyprinellus</i>

<i>Common name</i>	<i>Scientific name</i>
River Carpsucker	<i>Carpoides carpio</i>
Shorthead Redhorse	<i>Moxostoma macrolepidotum</i>
Freshwater Drum	<i>Aplodinotus grunniens</i>
Fathead Minnow	<i>Pimephales promelas</i>
Emerald Shiner	<i>Notropis atherinoides</i>
Common Shiner	<i>Luxilus cornutus</i>
Golden Shiner	<i>Notemigonus crysoleucas</i>
Creek Chub	<i>Semotilus atromaculatus</i>
Brook Stickleback	<i>Culaea inconstans</i>
Logperch	<i>Percina caprodes</i>
Johnny Darter	<i>Etheostoma nigrum</i>
White Bass	<i>Morone chrysops</i>
Rock Bass	<i>Ambloplites rupestris</i>
Smallmouth Bass	<i>Micropterus dolomieu</i>
Largemouth Bass	<i>Micropterus salmoides</i>
Bluegill	<i>Lepomis macrochirus</i>
Pumpkinseed	<i>Lepomis gibbosus</i>
Green Sunfish	<i>Lepomis cyanellus</i>
Orange-spotted Sunfish	<i>Lepomis humilis</i>
Black Crappie	<i>Pomoxis nigromaculatus</i>
White Crappie	<i>Pomoxis annularis</i>
Yellow Perch	<i>Perca flavescens</i>
Walleye	<i>Stizostedion vitreum</i>
Saugeye	<i>Stizostedion spp.</i>
Northern Pike	<i>Esox lucius</i>
Shortnose Gar	<i>Lepisosteus platostomus</i>
Gizzard Shad	<i>Dorosoma cepedianum</i>
Mooneyes	<i>Hiodon alosoides</i>

<sup>1</sup> This list is based on the reference “Guide to the Common Fishes of South Dakota” (Neumann and Willis 1994) along with staff observations.

**BUTTERFLIES<sup>1</sup>**

<i>Common name</i>	<i>Scientific name</i>
<b>Parnassians and Swallowtails</b>	
Giant Swallowtail	<i>Papilio cresphontes</i>
Eastern Tiger Swallowtail	<i>Papilio glaucus</i>
Black Swallowtail	<i>Papilio polyxenes asterius</i>
<b>Whites and Sulphurs</b>	
Checkered White	<i>Pontia protodice</i>
Western White	<i>Pontia occidentalis</i>
Cabbage White	<i>Pieris rapae</i>
Olympia Marble	<i>Euchloe olympia</i>
Clouded Sulphur	<i>Colias philodice</i>
Orange Sulphur	<i>Colias eurytheme</i>
Dog Face	<i>Zerene cesonia</i>
Little Yellow	<i>Eurema lisa</i>
Dainty Sulphur	<i>Nathalis iole</i>
<b>Harvesters, Coppers, Hairstreaks, and Blues</b>	
Gray Copper	<i>Lycaena dione</i>
Bronze Copper	<i>Lycaena hyllus</i>
Purplish Copper	<i>Lycaena helloides</i>
Coral Hairstreak	<i>Satyrium titus</i>
Acadian Hairstreak	<i>Satyrium acadicum</i>
Striped Hairstreak	<i>Satyrium liparops aliparops</i>
Juniper Hairstreak	<i>Callophrys gryneus siva</i>
Gray Hairstreak	<i>Strymon melinus franki</i>
Marine Blue	<i>Leptotes marina</i>
Reakirt's Blue	<i>Hemiargus isola</i>
Eastern Tailed-Blue	<i>Everes comyntas</i>
Summer Azure	<i>Celastrina neglecta</i>
Silvery Blue	<i>Glaucopsyche lygdamus oro</i>
Melissa Blue	<i>Lycaeides melissa</i>
<b>Skippers</b>	
Silver-spotted Skipper	<i>Epargyreus clarus</i>
Common Checkered Skipper	<i>Pyrgus communis</i>
Common Sootywing	<i>Pholisora catullus</i>
Least Skipper	<i>Ancyloxypha numitor</i>
Poweshiek Skipperling	<i>Oarisma poweshiek</i>
Uncas Skipper	<i>Hesperia uncas</i>
Ottoe Skipper	<i>Hesperia ottoe</i>
Leonard's Skipper	<i>Herperia leonardus pawnee</i>
Dakota Skipper	<i>Hesperia dacotae</i>
Sachem	<i>Atalopedes campestris</i>
Peck's Skipper	<i>Polites peckius</i>
Tawny-edged Skipper	<i>Polites themistocles</i>
Crossline Skipper	<i>Polites origenes rhena</i>
Long Dash	<i>Polites mystic dacotah</i>

<i>Common name</i>	<i>Scientific name</i>
Arogos Skipper	<i>Atrytone arogos iowa</i>
Delaware Skipper	<i>Anatrytone logan lagus</i>
Hobomok Skipper	<i>Poanes hobomok</i>
Kiowa Skipper	<i>Euphyes vestries kiowah</i>
Common Roadside Skipper	<i>Amblyscirtes vialis</i>
Brushfoots	
American Snout	<i>Libytheana carinenta bachmanii</i>
Variiegated Fritillary	<i>Euptoieta claudia</i>
Great Spangled Fritillary	<i>Speyeria cybele</i>
Manitoba Fritillary	<i>Speyeria aphrodite manitoba</i>
Regal Fritillary	<i>Speyeria idalia</i>
Edwards' Fritillary	<i>Speyeria edwardsii</i>
Callippe Fritillary	<i>Speyeria callippe calgariana</i>
Myrina Fritillary	<i>Boloria selene myrina</i>
Meadow Fritillary	<i>Boloria bellona</i>
Gorgone Checkerspot	<i>Chlosyne gorgone carlota</i>
Silvery Checkerspot	<i>Chlosyne nycteis</i>
Pearl Crescent	<i>Phyciodes tharos</i>
Northern Crescent	<i>Phyciodes cocyta</i>
Question Mark	<i>Polygonia interrogationis</i>
Eastern Comma	<i>Polygonia comma</i>
Gray Comma	<i>Polygonia progne</i>
Mourning Cloak	<i>Nymphalis antiopa</i>
Milbert's Tortoiseshell	<i>Nymphalis milberti</i>
Red Admiral	<i>Vanessa atalanta rubria</i>
American Lady	<i>Vanessa virginiensis</i>
Painted Lady	<i>Vanessa cardui</i>
Common Buckeye	<i>Junonia coenia</i>
White Admiral	<i>Limenitis arthemis arthemis</i>
Red-spotted Purple	<i>Limenitis arthemis astyanax</i>
Viceroy	<i>Limenitis archippus</i>
Mountain Emperor	<i>Asterocampa celtis antonia</i>
Tawny Emperor	<i>Asterocampa clyton</i>
Northern Pearly-Eye	<i>Enodia anthedon</i>
Eyed Brown	<i>Satyrodes Eurydice</i>
Little Wood-Satyr	<i>Megisto cymela</i>
Prairie Ringlet	<i>Coenonympha tullia benjamini</i>
Common Wood-Nymph	<i>Cercyonis pegala nephele</i>
Monarch	<i>Danaus plexippus</i>
Uhler's Arctic	<i>Oeneis uhleri varuna</i>

<sup>1</sup> This list is based on the reference Field Guide to Butterflies of South Dakota (Marrone 2002) along with staff observations.

**PLANTS<sup>1</sup>**

<i>Common name</i>	<i>Scientific name</i>
Absinth wormwood	<i>Artemisia absinthium</i>
Alfalfa	<i>Medicago</i> spp.
American elm	<i>Ulmus americana</i>
American Sloughgrass	<i>Beckmannia syzigachne</i>
Annual sunflower	<i>Helianthus annus</i>
Baltic rush	<i>Juncus balticus</i>
Barley	<i>Hordeum</i> spp.
Barnyardgrass	<i>Echinochloa muricata</i>
Big bluestem	<i>Andropogon gerardii</i>
Blanket flower	<i>Gaillardia aristata</i>
Bracted spiderwort	<i>Tradescantia bracteata</i>
Breadroot scurfpea	<i>Pedimelum esculentum</i>
Buffalo grass	<i>Buchloe dactyloides</i>
Bur oak	<i>Quercus macrocarpa</i>
Canada goldenrod	<i>Solidago canadensis</i>
Canada thistle	<i>Cirsium arvense</i>
Canada wildrye	<i>Elymus canadensis</i>
Cattail	<i>Typha</i> spp.
Cocklebur	<i>Xanthium strumarium</i>
Common dandelion	<i>Taraxacum officinale</i>
Common reed	<i>Phragmites australis</i>
Corn	<i>Zea mays</i>
Crested Wheatgrass	<i>Agropyron cristatum</i>
Cudweed sagewort	<i>Artemisia ludoviciana</i>
Curlycup gumweed	<i>Grindelia squarrosa</i>
Daisy fleabane	<i>Erigeron strigosus</i>
Downy brome	<i>Bromus tectorum</i>
False boneset	<i>Kuhnia eupatorioides</i>
Fescue sedge	<i>Carex brevior</i>
Field bindweed	<i>Convolvulus arvensis</i>
Field pussytoes	<i>Antennaria neglecta</i>
Foxtail barley	<i>Hordeum jubatum</i>
Goat's beard	<i>Tragopogon dubius</i>
Green ash	<i>Fraxinus pennsylvanica</i>
Green foxtail	<i>Setaria viridis</i>
Green muhly	<i>Muhlenbergia racemosa</i>
Green needlegrass	<i>Nassella viridula</i>
Green sagewort	<i>Artemisia campestris</i>
Hardstem bulrush	<i>Schoenoplectus acutus</i>
Heath aster	<i>Aster ericoides</i>
Indian breadroot	<i>Psoralea esculenta</i>
Indiangrass	<i>Sorghastrum</i> spp.
Intermediate wheatgrass	<i>Agropyron intermedium</i>
Japanese brome	<i>Bromus japonicus</i>

<i>Common name</i>	<i>Scientific name</i>
Junegrass	<i>Koeleria macrantha</i>
Kentucky bluegrass	<i>Poa pratensis</i>
Kochia	<i>Kochia scoparia</i>
Leadplant	<i>Amorpha canescens</i>
Leafy spurge	<i>Euphorbia esula</i>
Little bluestem	<i>Schizachyrium</i> spp.
Maximilian sunflower	<i>Helianthus maximilian</i>
Needle and thread	<i>Hesperostipa comata</i>
Pink wild onion	<i>Allium stellatum</i>
Plains cottonwood	<i>Populus deltoides</i>
Plains muhly	<i>Muhlenbergia cuspidate</i>
Porcupine grass	<i>Stipa spartea</i>
Prairie chickweed	<i>Cerastium arvense</i>
Prairie coneflower	<i>Ratibida columnifera</i>
Prairie cordgrass	<i>Spartina pectinata</i>
Prairie dropseed	<i>Sporobolus heterolepis</i>
Prairie junegrass	<i>Koeleria pyramidata</i>
Prairie wild rose	<i>Rosa arkansana</i>
Purple loosestrife	<i>Lythrum salicaria</i>
Purple meadowrue	<i>Thalictrum dasycarpum</i>
Purple prairie clover	<i>Dalea purpurea</i>
Quackgrass	<i>Elymus repens</i>
Redtop	<i>Agrostis stolonifera</i>
Reed canarygrass	<i>Phalaris arundinacea</i>
Rush	<i>Juncus</i> spp.
Russian olive	<i>Elaeagnus angustifolia</i>
Sandbur	<i>Cenchrus longispinus</i>
Sand dropseed	<i>Sporobolus cryptandrus</i>
Scarlet globemallow	<i>Sphaeralcea coccinea</i>
Sedge	<i>Carex</i> spp.
Sideoats grama	<i>Bouteloua curtipendula</i>
Silverleaf scurfpea	<i>Pedimelum argophyllum</i>
Slender wheatgrass	<i>Elymus trachycaulus</i>
Smooth brome	<i>Bromus inermis</i>
Stiff goldenrod	<i>Solidago rigida</i>
Stiff sunflower	<i>Helianthus pauciflorus</i>
Soybean	<i>Glycine</i> spp.
Spotted knapweed	<i>Centaurea biebersteinii</i>
Spring wheat	<i>Triticum</i> spp.
Sweetclover	<i>Melilotus officinalis</i>
Switchgrass	<i>Panicum virgatum</i>
Timothy	<i>Phleum pretense</i>
Torch flower	<i>Geum triflorum</i>
Water hemlock	<i>Cicuta maculata</i>
Western ragweed	<i>Ambrosia psilostachya</i>

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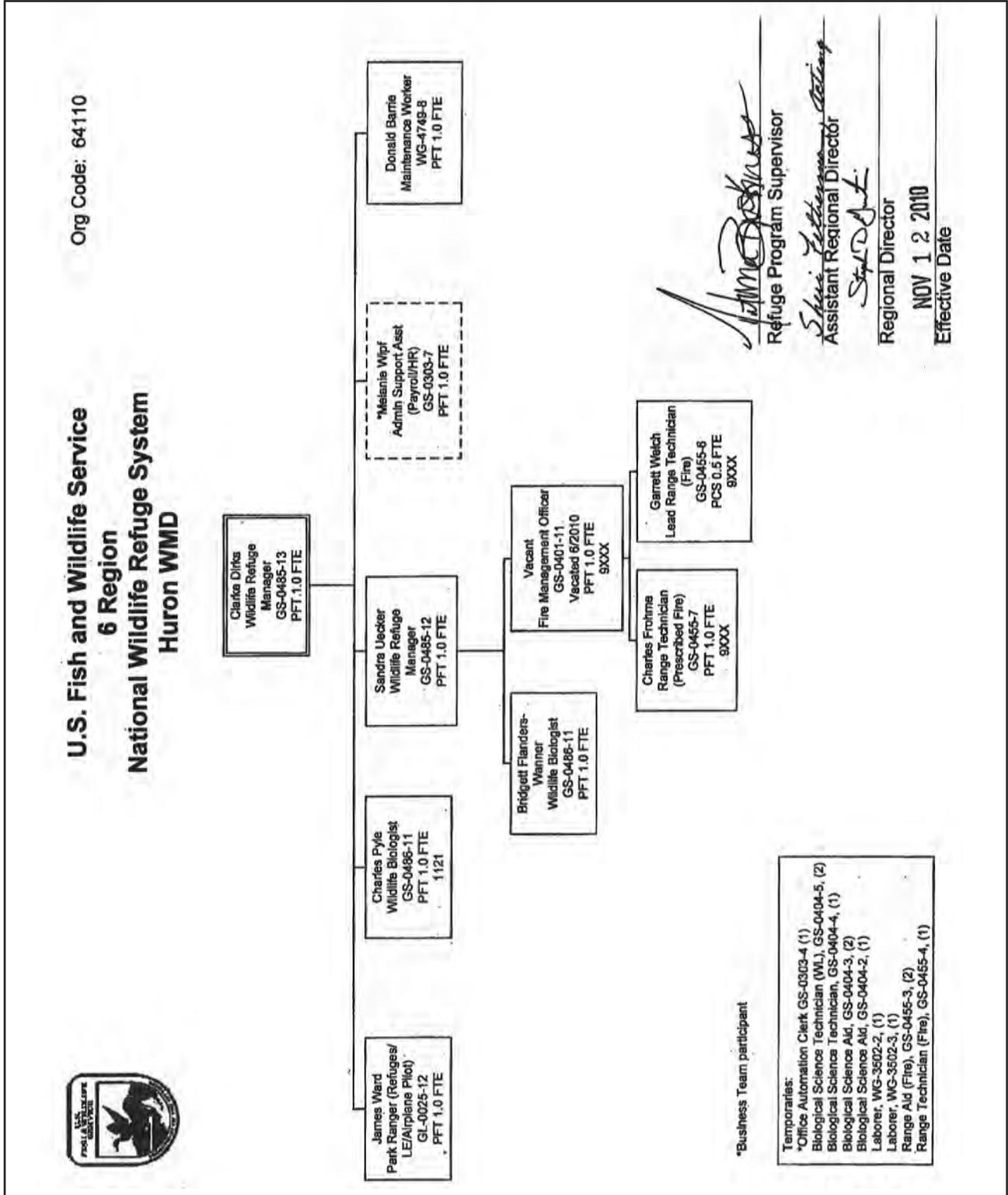
<i>Common name</i>	<i>Scientific name</i>
Western snowberry	<i>Symphoricarpos occidentalis</i>
Western wheatgrass	<i>Agropyron smithii</i>
White beardtongue	<i>Penstemon albidus</i>
White prairie clover	<i>Dalea candida</i>
Willow	<i>Salix</i> spp.
Witchgrass	<i>Panicum capillare</i>
Wormwood sage	<i>Artemisia absinthium</i>
Yellow foxtail	<i>Setaria glauca</i>

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<sup>1</sup> *This list is based on the reference Grassland Plants of South Dakota and the Northern Great Plains (Johnson and Larson 2007) and Selected North Dakota and Minnesota Range Plants (Sedivec and Barker) along with staff observations.*

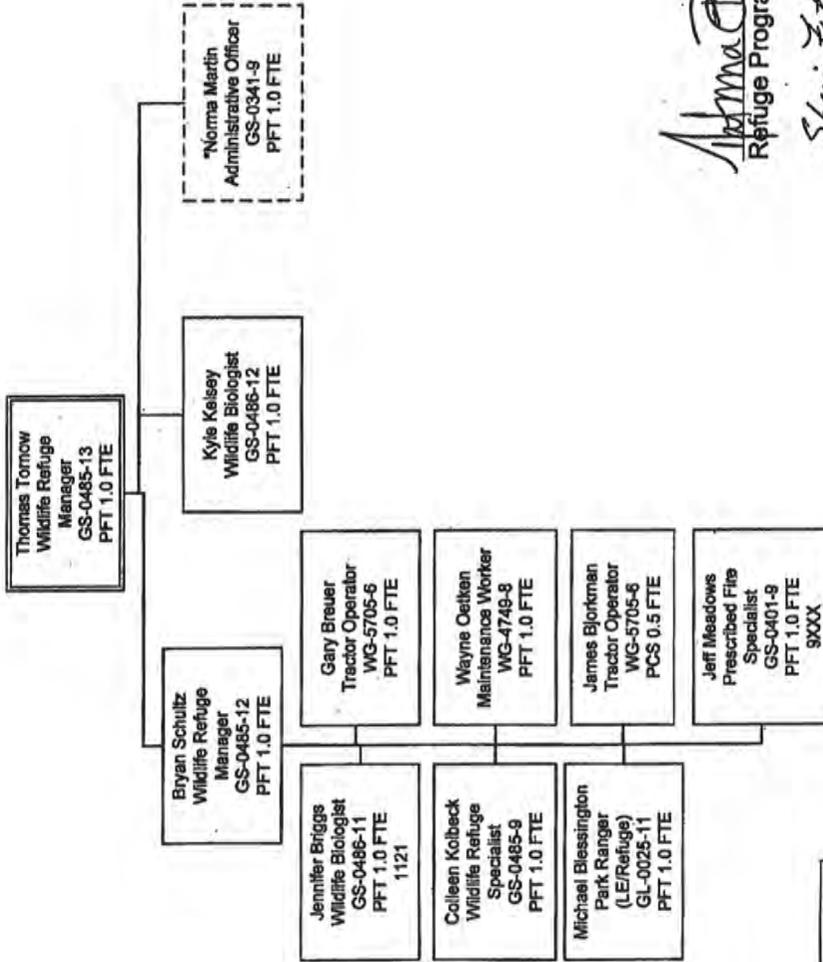
# Appendix H

## Approved Organization Charts



Org Code: 64560

**U.S. Fish and Wildlife Service  
6 Region  
National Wildlife Refuge System  
Madison WMD**



*Abma Bohner*  
Refuge Program Supervisor

*Shari Fithian Acting*  
Assistant Regional Director

*Steph D. J...*  
Regional Director  
NOV 12 2010

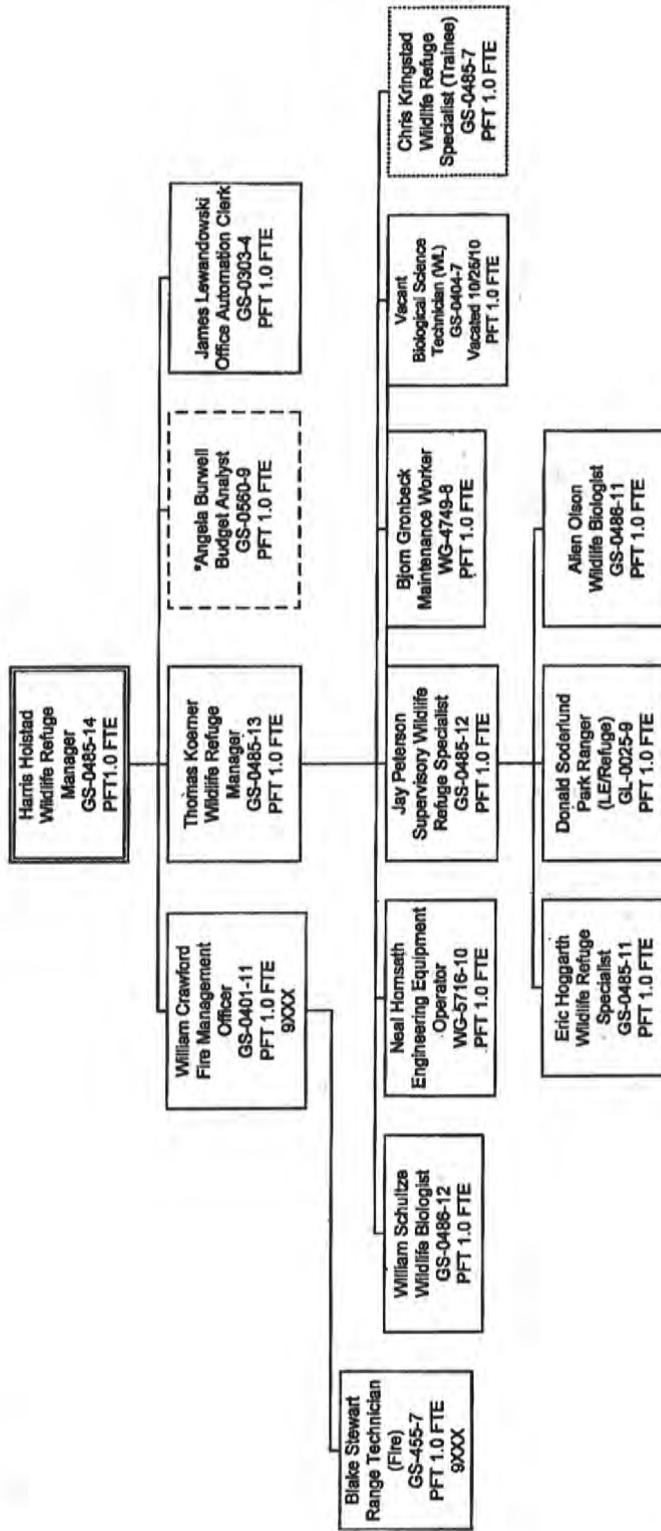
Effective Date

\*Business Team participant

- Temporaries:
- Biological Science Aid, GS-0404-3, (4)
  - Biological Science Technician, GS-0404-4, (2)
  - Biological Science Technician (WL), GS-0404-7, (1)
  - Biological Science Technician, GS-0404-5, (1)
  - Laborer, WG-3502-3, (1)
  - Laborer, WG-3502-2, (1)
  - Office Automation Clerk, GS-0326-2, (1)
  - Office Automation Clerk, GS-0303-4, (1) Term

Org Code: 64570

**U.S. Fish and Wildlife Service  
6 Region  
National Wildlife Refuge System  
Sand Lake NWR**



\*Business Team participant

Temporarily:  
Biological Science Aid, GS-0404-3, (7)  
Range Aid (Fire), GS-0455-3, (2)

*Alanna Buehler*  
Refuge Program Supervisor

*Shawn Fetherman*  
Assistant Regional Director

*SPD/jt*  
Regional Director

NOV 1 2 2010

Effective Date



# Appendix I

## *Compliance with Migratory Bird Treaty Act and Guidance*



IN REPLY REFER TO:

### United States Department of the Interior

#### FISH AND WILDLIFE SERVICE Mountain-Prairie Region



MAILING ADDRESS:  
P.O. Box 25486, DFC  
Denver, Colorado 80225-0486

STREET LOCATION:  
134 Union Boulevard  
Lakewood, Colorado 80228-1807

SEP 23 2010

#### Memorandum

To: All Region 6 National Wildlife Refuge System Employees

From: Assistant Regional Director, National Wildlife Refuge System, Region 6

Subject: Compliance with Migratory Bird Treaty Act and Guidance

As many of you are aware, Refuges met with Office of Law Enforcement (OLE) and the Migratory Bird Office (MB) to develop draft guidance to field stations on compliance with Migratory Bird Treaty Act (MBTA). U. S. Fish and Wildlife Service policy 720 FW 2 describes the Agency's responsibility to protect migratory birds. We are required to evaluate projects and management practices to avoid or minimize take of migratory birds with emphasis on Birds of Management Concern, the most recent list is attached. The other two attachments described below are designed to provide Project Leaders and Partners Biologists with guidance on compliance with MBTA.

The attachment titled "Conducting National Wildlife Refuge Non-Habitat Management Activities in Region 6" is designed to provide guidance to Project Leaders on non-habitat management activities that may result in the take of migratory birds. This would include construction and rehabilitation projects, such as wetland creation/restoration, dikes/dams, water control structures, buildings, roads, wells, power lines, water lines, septic systems, and other non-habitat management activities. If your project involves anything that is on or will be placed on your Real Property Inventory, then it fits under this guidance. If you are conducting an activity of any sort besides habitat management and it could result in take of migratory birds, then this guidance should be followed. This is also the same guidance provided to corporations and the private industry by Ecological Services, MB, and OLE.

The attachment titled "Conducting National Wildlife Refuge Habitat Management Activities in Region 6" is designed to provide guidance to Project Leaders on habitat management activities that may result in the take of migratory birds. The two areas focused on were mechanical treatment (e.g., haying, mowing, tree/shrub removal, and non-chemical invasive species suppression) and prescribed fire. Guidance on these activities is outlined in this document. Other habitat management activities, such as grazing and chemical treatment of invasive species, are not defined and best management practices should be implemented.

If you have questions on the guidance provided, please contact your zone supervisor.

Attachments



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