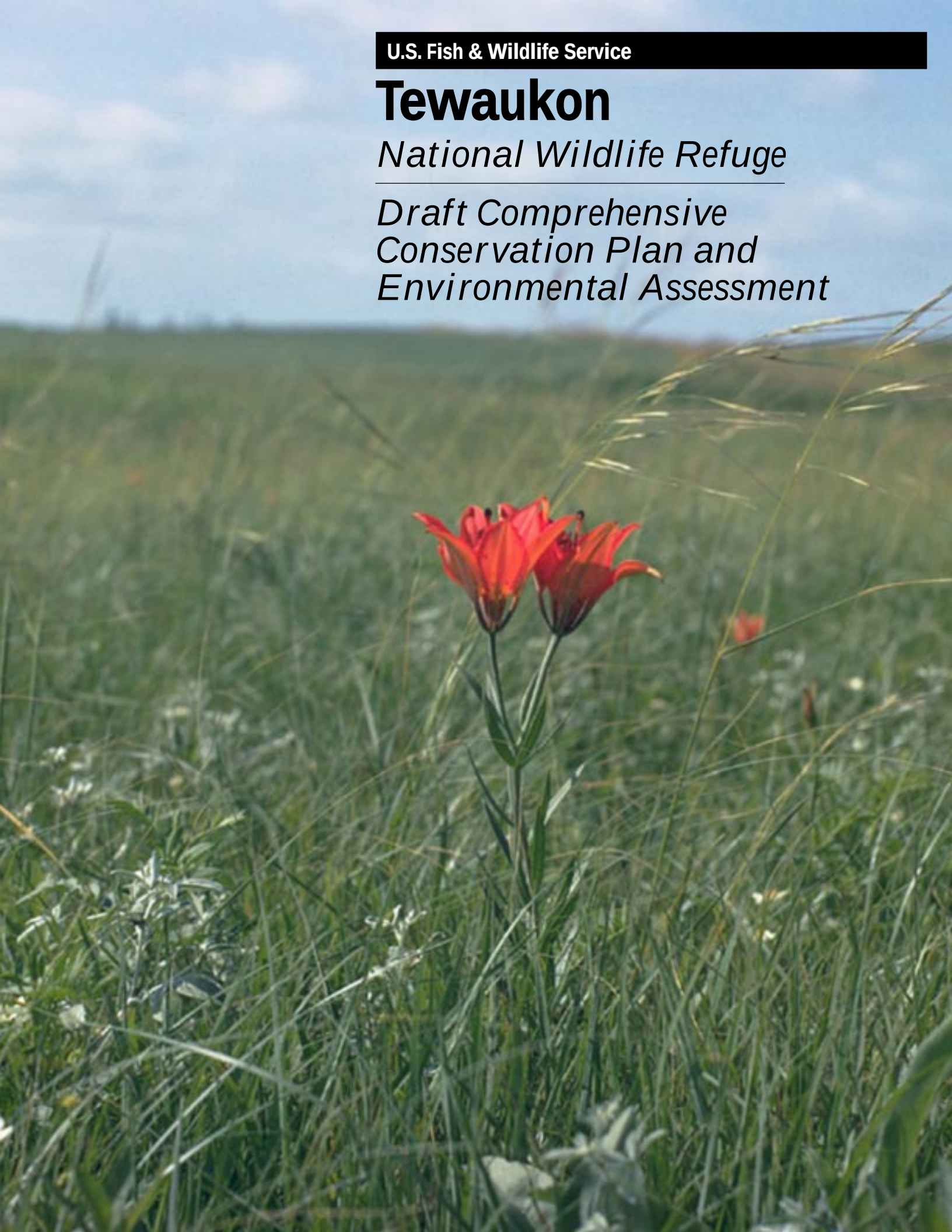
U.S. Fish & Wildlife Service

Tewaukon

National Wildlife Refuge

Draft Comprehensive Conservation Plan and Environmental Assessment



Tewaukon
National Wildlife Refuge

Draft
Comprehensive Conservation Plan
and Environmental Assessment

June 2000

Prepared by
U.S. Fish and Wildlife Service
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Summary

The U.S. Fish and Wildlife Service (Service) is the principal Federal agency with the responsibility for conserving, protecting, and enhancing fish and wildlife and their habitats. The Service manages a diverse network of more than 500 national wildlife refuges. A System which encompasses more than 92 million acres of public land and water, and provides habitat for more than 5,000 species of birds, mammals, fish, and insects.

The Tewaukon National Wildlife Refuge Complex (Complex) includes the Tewaukon Refuge and the Tewaukon Wetland Management District (WMD). The Refuge is composed of the Tewaukon and Sprague Lake Units (8,363 acres) and two easement refuges (Storm Lake and Wild Rice). The WMD includes 14,000 acres of Waterfowl Production Areas (WPAs), 35,000 acres of wetland easements and 10,386 acres of grassland easements in Ransom, Richland, and Sargent Counties, North Dakota. The lands were acquired for the primary purpose of supporting migratory birds and other wildlife. The Complex is located on the gently rolling glacial till plain of the Prairie Pothole Region and the Red River of the North Valley (original bed of glacial Lake Agassiz). Birds from both the Central and Mississippi Flyways use Complex habitat. Over 243 bird species have been recorded in the area. Of these species, 100 are known to nest in the area, and the remainder can be seen during spring and fall migrations. Many other reptile, amphibian, mammal, and invertebrate wildlife species live on Tewaukon Complex lands.

The Complex has four key wildlife and habitat values: 1) wetlands provide important migration and breeding habitat for waterfowl and other waterbirds, and habitat for several species associated with wetlands including leopard frogs, painted turtles, mink, muskrats and invertebrates; 2) tallgrass prairie remnants provide some of the last remaining habitat for nesting and migrating grassland birds, rare prairie butterflies, and other prairie wildlife; 3) other grassland habitat provides winter cover for resident species and breeding habitat for ground nesting birds and other grassland wildlife; 4) riparian habitat that provides breeding and migration areas for many species of birds and mammals. The Tewaukon Complex also provides unique and important values for people. Wildlife, habitat, scenery, recreation, and cultural history all combine to make the Complex a national treasure.

Comprehensive Conservation Plans (CCP) were mandated by the National Wildlife Refuge System Improvement Act of 1997. This Act requires that the CCP must identify and describe 1) purposes of the Complex; 2) fish, wildlife, and plant populations and their habitats; 3) archaeological and cultural values; 3) significant fish, wildlife and plant problems; and 4) the actions necessary to correct them. The CCP should also identify and describe compatible wildlife-dependent recreational opportunities and administrative and visitor facilities.

Benefits of the CCP are several: better long-term continuity in Complex management; better understanding of Complex management actions for Complex staff members and visitors; a clear description of future development and funding needs; and the assurance that Complex management will fulfill the mission of the National Wildlife Refuge System and the specific purposes for which the Complex was established.

The Tewaukon CCP will be used to prepare step-down management plans and revise existing plans. It also will be used to prepare budgets which describe specific actions to be taken by the Complex over the next 15 years. Given that new information, guidance and technology frequently change and become available, the CCP will be updated as necessary throughout the 15-year period.

The Environmental Assessment considered three management alternatives for management of the Tewaukon Complex. Each of the alternatives were evaluated for environmental consequences in accordance with the National Environmental Policy Act (NEPA). For a summary of the alternatives considered during the planning process, see the Tewaukon National Wildlife Complex Environmental Assessment in Appendix F. The CCP is the preferred alternative.

VISION: Tewaukon National Wildlife Refuge Complex will be preserved, managed, and enhanced as a part of the tallgrass prairie wetland ecosystem capable of supporting migratory birds and other native wildlife and plants for the benefit of present and future generations. The Complex will provide an environment where a diversity of native tallgrass prairie, wetlands, plants, wildlife, and their natural processes can be observed and explored. It will provide a place where people can learn about wildlife and their habitats and enjoy wildlife-dependent recreation.

The management focus of the CCP is summarized by four major Complex goals that are supported by a series of objectives and implementation strategies. Those goals include:

Habitat: Preserve, restore, and enhance the ecological diversity of native flora, other grasslands and wetlands within the tallgrass prairie wetland ecosystem.

Wildlife: Preserve, restore, and enhance the ecological diversity and abundance of migratory birds and other native wildlife with emphasis on waterfowl, grassland, and wetland-dependent birds.

Public Use/Recreation and Environmental Education:
Provide recreational and educational opportunities for persons of all abilities to learn about and enjoy the tallgrass prairie wetland ecosystem, the fish and wildlife found there, and the history of the Complex in a safe and compatible manner.

Partnerships:
Promote partnerships to preserve, restore, and enhance a diverse, healthy, and productive prairie/wetland ecosystem in which the Tewaukon Complex plays a key role.

The achievement of these goals will result in the following major accomplishments in the Complex over the next 15 years (includes implementation of Drift Prairie Project, North American Wetlands Conservation Act Grant, and the Dakota Tallgrass Prairie Project):

Habitat:
- Protection of the remaining tracts of tallgrass prairie in the District with grassland easements, cooperative agreements or fee title acquisition (approximately 60,000 acres).
- Enhancement of 3,716 acres of existing native prairie areas on Complex lands by reducing nonnative plants and increasing the abundance and the number of native plants species.
- Management of the vegetative structure and species composition on other grasslands on the Complex to provide for the needs of grassland nesting birds.
- Restoration of 1,700 acres of old dense nesting cover (DNC), invasive nonnative grasses, and crop fields to a diverse native plant community on Complex lands.
- Enhancement of 38 managed Refuge wetlands to mimic natural drawdown cycles and reduce nonnative wetland plants. Improve the water quality in Wild Rice River as it enters the Refuge by restoring wetlands and adding vegetative buffer strips.
- Protection of wetlands on private land through fee title, easements or cooperative agreements.
- Enhancement of wetlands by implementing low impact (minimum till) agricultural practices on surrounding uplands, grazing systems, repairing water management structures, and placing waterfowl nesting structures on private land.
- Restoration and creation of wetlands on private land.

Wildlife:
- Improvement of waterfowl nesting success on the Refuge and six high priority Waterfowl Production Areas.
- Maintenance of 135 acres of cropland on the Refuge as food for migratory birds and resident wildlife.
- Reduction of nonnative wildlife on the Complex through habitat management and direct removal.
- Minimize wildlife disturbance by the public by limiting access at certain times of the year and by activity.

Cultural Resources:
- Gather more information on the cultural resources on the Complex. Provide additional interpretation and protection of these cultural resources.

Public Use/Recreation and Environmental Education:
- Maintain a recreational fishing program in Tewaukon and Sprague Lakes by reducing carp and by continuing to manage the two lakes as open water migratory bird rest areas.
- Continue to provide public opportunity for hunting of white-tailed deer and pheasants on the Refuge and wildlife observation and photography with limited access.
- Expand the Refuge Visitor Center, including exhibits. Expand the hours the Visitor Center is open to the public.
- Improvement of the Complex outreach program through new brochures, a website, displays, and signs.
- Continue to provide environmental education programs and activities.

Partnerships:
- Continue to work with existing partners on habitat management, enhancement and protection programs; recreational programs; and environmental education activities.
- Create opportunities for new partnerships to assist in implementing the CCP.
- Foster a volunteer program on the Complex.

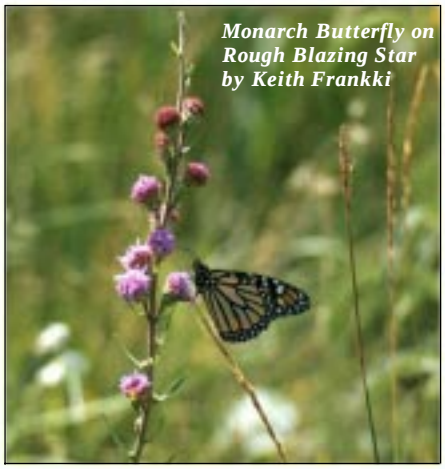
Time Frame for the Process

From the time that this Draft is published, the public will have a 30-day comment period. Public comments will be considered, then a Final Plan is expected to be completed by the Fall of 2000.

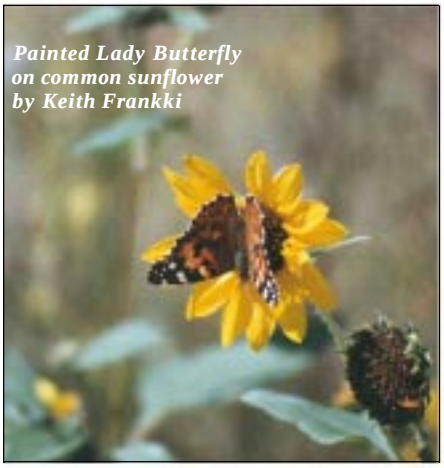
Western Prairie Fringed Orchid by Keith Frankki

White Lady's Slipper by Keith Frankki

Ladies Tresses by Keith Frankki

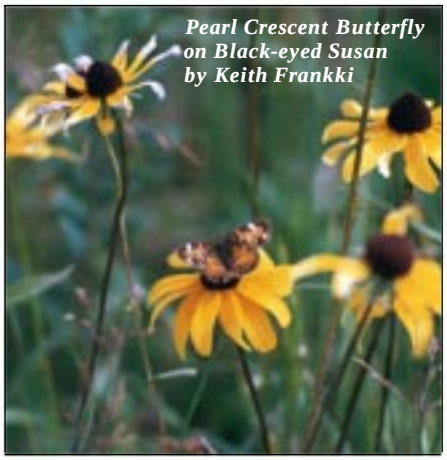


Monarch Butterfly on Rough Blazing Star by Keith Frankki

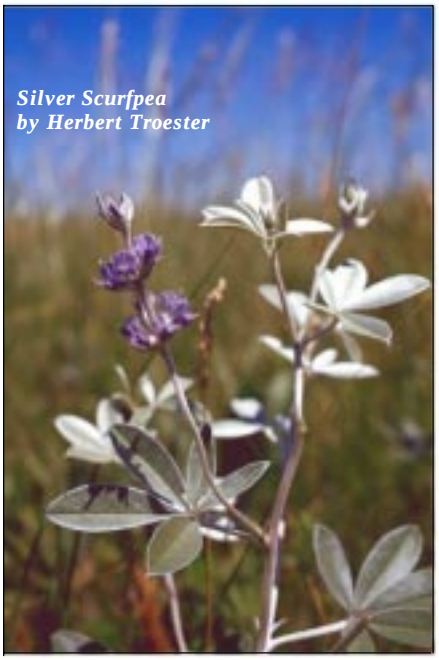


Painted Lady Butterfly on common sunflower by Keith Frankki

Prairie Coneflower and Leadplant by Herbert Troester



Pearl Crescent Butterfly on Black-eyed Susan by Keith Frankki



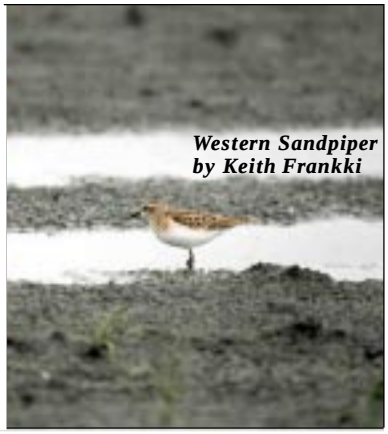
Silver Scurfpea by Herbert Troester

Blue-eyed Grass by Keith Frankki

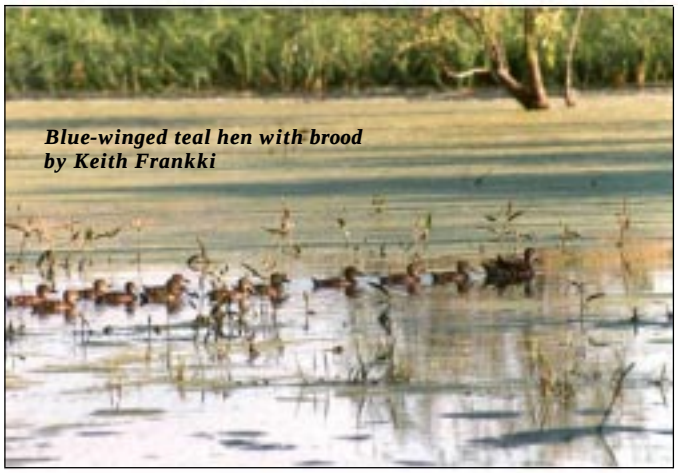
Black-eyed Susan by Keith Frankki

Lesser Golden Plover
by Keith Frankki

Great Egret Chicks on Pool 7A Rookery
by Keith Frankki



Western Sandpiper
by Keith Frankki



Blue-winged teal hen with brood
by Keith Frankki

Mallard hen with brood
by Herbert Troester

Blue-winged teal pair
by Keith Frankki

Successful hunters showing off white-tailed buck by Jack Lalor

Pintail
by Keith Frankki

Aerial view of prairie pothole region by Jack Lalor

Song Sparrow
by Keith Frankki

Introduction and Background

Background

The Tewaukon National Wildlife Refuge Complex (Complex) is located in the southeast corner of North Dakota (See Map 1). The Complex includes the Tewaukon National Wildlife Refuge (NWR) including the Sprague Lake Unit, the Storm Lake Easement Refuge, the Wild Rice Easement Refuge, and the Tewaukon Wetland Management District (WMD). The Refuge is 8,363 acres in size and is located in Sargent County. On June 26, 1945, Public Land Order 286 established the area known as the Tewaukon NWR as "... a refuge and breeding ground for migratory birds and other wildlife...." The Tewaukon Wetland Management District (WMD) was established in 1960 as a management unit for migratory birds. The Wetland Management District encompasses tracts in Sargent, Ransom, and Richland Counties. The District is comprised of Waterfowl Production Areas (fee title), wetland easements, and grassland easements in Ransom, Richland, and Sargent counties. The Tewaukon Complex staff administers over 14,000 acres of WPAs, over 35,000 acres protected by wetland easements, and 10,386 acres of grassland easements.

The Complex provides important habitat for migrating and breeding waterfowl, other water birds, grassland birds, and other migratory birds. Lands in the Complex also provide critical habitat for a variety of wetland and prairie mammals, reptiles, amphibians, and invertebrates. The Complex is a valuable area for recreation including hunting, fishing, and wildlife observation. The Refuge also has a long and rich cultural history. All of these factors make the Tewaukon Complex a national treasure.

Purpose and Need for Comprehensive Conservation Plan

The U.S. Fish and Wildlife Service (Service) is the principal Federal agency with the responsibility for conserving, protecting, and enhancing fish and wildlife and their habitats for the continuing benefit of the American people. The Service manages a diverse network of more than 500 National Wildlife Refuges. This National Wildlife Refuge System encompasses more than 92 million acres of public land and water, and provides habitat for more than 5,000 species of birds, mammals, fish, and insects.

Comprehensive Conservation Plans (CCPs) were mandated by the National Wildlife Refuge System Improvement Act of 1997. The Improvement Act requires that all lands and waters of the National Wildlife Refuge System be managed in accordance with an approved Comprehensive Conservation Plan. This Act requires the identification and description of 1) Complex purpose(s); 2) fish, wildlife, and plant populations and their habitats; 3) archaeological and cultural values; 4) significant fish, wildlife, and plant problems; and 5) the actions necessary to correct them. The Plan should also identify and describe opportunities for compatible wildlife-dependent recreational uses and administrative and visitor facilities.

The CCP describes long-term Complex management actions and purposes of the actions for Refuge staff and the public, in order to provide Complex management continuity. As the CCP was developed, public input regarding Complex issues and management was considered. The CCP is a description of the wildlife and habitat protection, management, and development that is needed for Complex purposes to be achieved. Funding and personnel needed to achieve the CCP are also described. Completing the work described in the CCP will accomplish Complex purposes and contribute to the mission of the Refuge System and the U.S. Fish and Wildlife Service.

Description of Planning Process

NEPA - National Environmental Policy Act

The National Environmental Policy Act (NEPA) of 1969 stipulates that a written assessment must be made of any action proposed by an agency of the Federal Government that significantly affects the quality of the human environment. NEPA also requires Federal decision makers to study, develop, and describe appropriate alternatives to recommended courses of action and solicit the views of other Federal and State agencies and the public early in the decision making process. An Environmental Assessment (EA) has been prepared to accompany this CCP (See Appendix F). The proposed action (preferred alternative) identified in the EA is the CCP (enhanced management alternative).

Tewaukon Complex Comprehensive Conservation Plan Process

The Tewaukon National Wildlife Refuge Complex Comprehensive Conservation Plan is guided by the established purpose of the Refuge and Wetland Management District, the Service and National Wildlife Refuge System missions, Service compatibility standards, and other Service policies, plans and laws related to Complex management.

> Planning is the process of deciding in advance what you are going to do. The Plan is the vehicle used to let others know in advance what you're going to do.

While developing the CCP, the planning team reviewed conservation planning efforts of the following groups: Partners in Flight, Western Hemisphere Shorebird Reserve Network, North American Waterfowl Management Plan Committee, U.S. Forest Service, ND Game and Fish Department, and Service Mainstem Missouri Eco-team (Appendix H).

This CCP establishes the goals, objectives, and strategies for Complex management. Listed below is an outline of the planning process used to develop the Tewaukon Complex CCP:

1. Preplanning (forming a planning team, identifying available people and funds, organizing efforts)
2. Identify Issues and Develop Vision » **Public Input Gathered on Issues**
3. Gather Information on Resources and Legal Responsibilities
4. Analyze Resource Relationships (Develop Goals and Objectives)
5. Develop Range of Alternatives
6. Assess Environmental Effects
7. Identify Preferred Alternative
8. Publish Draft Plan » **Public Comments on Draft Plan Gathered**
9. Respond to Comments
10. Adopt Plan
11. Implement Plan, Monitor/Evaluate Actions, Review and Revise

As with any process, comprehensive conservation planning is not necessarily linear or sequential, but can involve moving back and forth between steps. We are currently working on Stage 8 in the process (publishing the Draft Plan).

Compatibility Determinations

Compatibility determinations are required by the Refuge Improvement Act for any program or activity occurring on Refuge System lands. The planning team reviewed previously completed compatibility determinations regarding Complex programs and reevaluated these determinations to ensure they were relevant and current. Compatibility determinations document the evaluation of Complex programs and activities by the Refuge Manager. In a compatibility determination, a program or activity is judged to be compatible or incompatible with Refuge purposes. No current program or activity on the Refuge was determined to be incompatible as a result of this review. Even if uses are determined to be compatible, the Refuge Manager must also evaluate whether adequate staff and funding are available to support the program or activity. Compatibility determinations can be found in Appendix G.

Involving the Public

This planning effort will provide local communities, national, State, and Tribal organizations, and interested individuals an opportunity to have a voice concerning the future direction of the Complex. The primary thrust for the planning process is to provide a forum for ideas and issues to be shared, reviewed and evaluated. It is also important for the Service to provide information to the public throughout the process.

Since the Tewaukon Complex includes three Counties and many people visit the Complex from Fargo and Wahpeton, it was decided to hold open houses in several locations to gather public input. A list of the open houses held are as follows:

Sargent County	Forman City Hall (March 12, 1998)
Ransom County	Lisbon High School (March 17, 1998)
Richland County	American Legion Hankinson (March 24, 1998)
	Wahpeton Law Enforcement Center (March 26, 1998)
Cass County (Fargo)	ND State University Memorial Union (April 2, 1998)

The open houses provided participants an opportunity to learn about the Fish and Wildlife Service's and National Wildlife Refuge System's mission and goals and the Refuge and District purposes and current management issues. People attending were provided the chance to speak with Service representatives and to share their comments and concerns about current management. Attendees were also asked to suggest ways they would like to see Complex management change.

Prior to the public meetings, the Complex staff discussed the planning process with local County commissioners, sportsmen's groups, other interested groups, and advertised in the local media. Information on the planning process was also displayed in cafes and businesses frequented by community members in the three Counties comprising the Complex. A questionnaire on Refuge issues was provided to the public to stimulate additional public input for the planning process.

Issues Raised During the Planning Process

The Tewaukon Complex staff received a variety of input from the meetings, questionnaires, and verbal discussions. The majority of the public input dealt with public use and recreation issues. Most of the local input dealt with very specific issues. Refuge users were interested in expanded fishing hours, more year-round access, and fishing in more Refuge wetlands. Expanding Refuge hunting opportunities to include waterfowl and predators, and modification of existing hunting seasons (i.e., shortening the pheasant season) were other recreation issues brought up by the public. Habitat issues identified by the public included expanding or decreasing the acres of cropland and conducting more management (such as planting more shelterbelts for winter cover and food plots) for pheasants and deer on the Complex. Grassland habitat and management issues included more protection for grasslands, integrating more grazing into management, maintaining and increasing weed control efforts, and reducing grassland habitat fragmentation. Crop damage on private lands by Canada geese was an issue raised throughout the District. Issues involving land acquisition and subsequent loss of local tax revenue were also raised. The planning team identified many of the same issues raised by the public. Some additional issues that the planning team raised included the decline, protection, and management of wetland habitat, tallgrass prairie and associated migratory birds.

The Tewaukon CCP is designed to address broad management and wildlife issues.

Putting It All Together

Specific habitat management is the end product of this planning process. For example, Refuge habitat management actions such as weed control, farming, or water management should logically step-down from the broad Refuge System mission statement to the purposes the Refuge was established for, to the Refuge Vision statement. The links identified in the CCP planning process that step-down from the Refuge Vision to a habitat management action are established by setting habitat goals, quantifying the goals into objectives, and identifying a series of strategies that can be used to achieve the objectives. The strategies (specific habitat management) applied must be evaluated to determine if the objectives are being met. If the objectives are met, then the goals and vision should also be met.

Some strategies may not be effective and some will take a long time to evaluate. For example, an objective may be to eliminate the noxious weed leafy spurge using a variety of strategies such as chemical application and biological control. Refuge managers recognize that the objective of eliminating all leafy spurge is not possible since new infestations can start in small areas of soil disturbances. Current tools may also have limitations and may only slow the spread of leafy spurge or reduce the size of the infestation. The CCP is flexible. It allows for new strategies to be implemented as new methods become available and when existing strategies are not effective ways to meet the objective. Important things to keep in mind are other factors that influence outcomes besides management activities. These factors, which include animal impacts, wildfires, weather, funding and staffing, all influence the effectiveness of strategies and their outcomes.

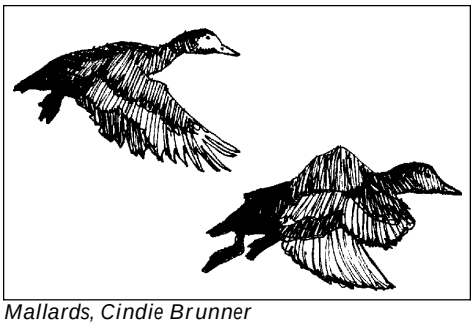
The CCP, which describes specific actions to be taken by the Complex staff over the next 15 years, will be used to prepare step-down management plans, revise existing plans, and budgets. Given that new information, techniques, and technology frequently arise, the CCP will be updated as necessary.

U.S. Fish and Wildlife Service Missions and Goals

The mission of the 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." The goals of the Service are aimed at fulfilling this mission. Some of the Service goals are: 1) sustaining fish and wildlife populations including migratory birds, endangered species, anadromous fish, and marine mammals; 2) conserving a network of lands and waters including the National Wildlife Refuge System; 3) providing Americans opportunity to understand and participate in the conservation and use of fish and wildlife resources.

National Wildlife Refuge System Mission and Goals

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" (1997 National Wildlife Refuge System Improvement Act). Goals of the System are to: 1) preserve, restore, and enhance threatened and endangered species in their natural ecosystems; 2) perpetuate the migratory bird resource; 3) preserve a natural diversity and abundance of refuge flora and fauna; 4) provide the public an understanding and appreciation of fish and wildlife ecology; 5) provide visitors with wildlife-dependent recreation.



Mallards, Cindie Brunner

National wildlife refuges are guided by the mission and goals of the Service and National Wildlife Refuge System, the designated purpose of the Refuge unit as described in the establishing legislation and/or executive orders, Service laws and policy, and international treaties (for a complete list see Appendix E). Individual refuges provide specific habitat requirements that support trust resource species including migratory birds, endangered species, marine mammals, and anadromous fish. For example, waterfowl breeding refuges in South and North Dakota provide important wetland and grassland habitat that supports populations of waterfowl as authorized by the Migratory Bird Conservation Act and the North American Waterfowl Management Plan. The Tewaukon Complex supports breeding populations of waterfowl and provides migration habitat during spring and fall periods. Sabine NWR and other refuges in Louisiana and Texas provide wintering habitat for waterfowl populations. This network (system) of refuge lands is critical to the survival of these birds. Any deficiency in one location affects the species and the entire system's ability to maintain self-sustaining populations.

Legislative history exists that recognizes the importance of providing for wildlife oriented recreation for people on national wildlife refuges. The Refuge Recreation Act of 1962 (16 USC 460k-460k-4) provided guidance for the Service to provide wildlife oriented recreational opportunities for the public if they were compatible with the primary purposes that the refuge was established for, and funds were available for the development, operation, and maintenance of recreational programs. In the National Wildlife Refuge System Improvement Act of 1997, six wildlife-dependent recreational uses are recognized as priority public uses of refuge lands. These are wildlife observation and photography, environmental education and interpretation, and fishing and hunting. These, and other uses, can be allowed on refuges if they are compatible with the purpose of the refuge and funding is available to support them. Uses may be allowed through a special regulation process, individual special use permits, and sometimes through State fishing and hunting regulations.

Complex and Resource Descriptions

Tewaukon Complex History

The Tewaukon National Wildlife Refuge Complex is located in the southeast corner of North Dakota (See Map 2). The Complex includes the Tewaukon NWR and the Tewaukon Wetland Management District (WMD). The Refuge is composed of the Tewaukon and Sprague Lake Units. The WMD includes Waterfowl Production Areas and wetland and grassland easements and two easement refuges. It is located on the gently rolling glacial till plain in the Prairie Pothole Region and the Red River of the North Valley (original bed of ancient glacial Lake Agassiz). It hosts birds from both the Central and Mississippi Flyways (See Figure 1 and 2). More than 243 bird species have been recorded in the area. Of these species, 100 are known to nest in the area and the remainder can be seen during spring and fall migrations when peak numbers occur.

Central Flyway

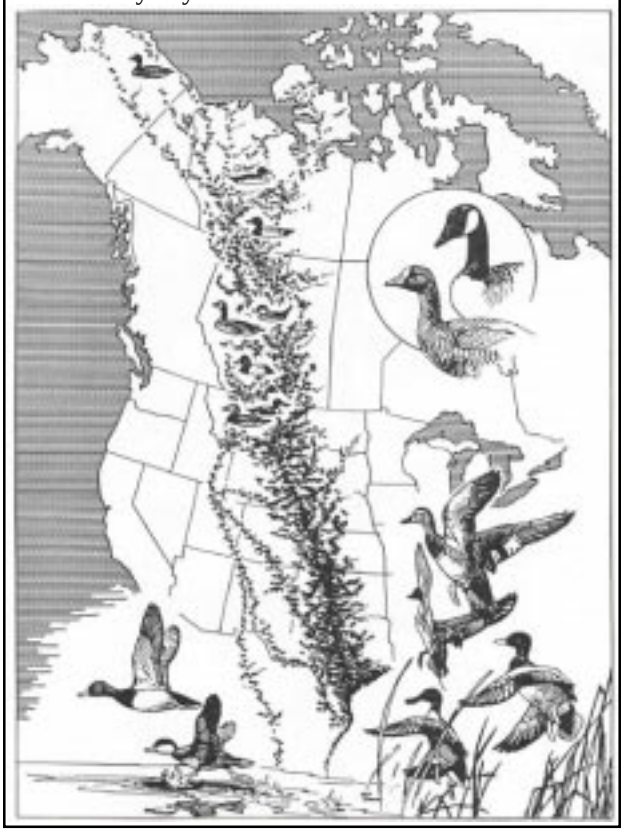


Figure 1. USDI, FWS. Flyways, Pioneering Waterfowl Management in North America. 5/84, 517 pgs.

Mississippi Flyway

Figure 2. USDI, FWS. Flyways, Pioneering Waterfowl Management in North America. 5/84, 517 pgs.

Tewaukon National Wildlife Refuge

Land around Lake Tewaukon has been a part of the U.S. Fish and Wildlife Service's National Wildlife Refuge System since 1934. An Easement Refuge was established on November 26, 1934 by Executive Order 6910, which provided for acquisition of easements for flowage and refuge purposes and filing of water rights. At that time, the Government's goal was to provide jobs for the unemployed and conserve water and wildlife resources. As part of Franklin Roosevelt's "New Deal," the Work Progress Administration worked with local landowners to purchase refuge easements which reserved the right to impound water (to maintain water areas during drought), maintain no hunting areas for migratory birds, and serve as wildlife conservation demonstration areas. Though these were perpetual easements, the land remained in private ownership. The construction of dams in these areas provided employment for workers and developed additional water resources. Water rights for the additional impounded water were also applied for from the State of North Dakota during this time. The easement refuges where water rights were applied for included Lake Tewaukon, Hepi Lake, Lake Elsie, Storm Lake, and Wild Rice Refuges. One fee title piece of 80 acres along the Wild Rice River west of the current headquarters was purchased in 1936 and used for temporary housing and storage. The area was managed from the Sand Lake National Wildlife Refuge located 80 miles to the southwest of Tewaukon just north of Aberdeen, South Dakota.

The Tewaukon easement lands were reserved and purchased as a Government-owned Refuge with the encouragement and support of local landowners and sportsmens groups. These landowners and groups wanted to protect the area for wildlife and to continue recreational fisheries improvements. On June 26, 1945, Public Land Order 286 established Tewaukon Refuge as "... a refuge and breeding ground for migratory birds and other wildlife...." In 1946, 512 acres were purchased in fee title around Lake Tewaukon. Since that original Refuge purchase, additional lands have been acquired totaling 8,363 acres. In March of 1956, Sand Lake NWR turned over management of the area to an on-site staff (one refuge manager) in a headquarters located five miles south of Cayuga, North Dakota.

Original management objectives established in the Master Plan for the Refuge in October 1962 included: "Primary objectives (1) to provide optimum nesting habitat for ducks; (2) to provide protection and food for fall and spring concentrations of migrant ducks and geese, primarily the smaller races of Canada geese, and snow and blue geese. Secondary objectives are (1) to maintain balanced population of all resident wildlife species; (2) to provide for public observation of wildlife species in their natural environment; (3) to provide limited day-use recreation including public hunting, where and when such activities are compatible with primary management objectives of the refuge."

The Tewaukon area has a rich historical background. Prior to settlement by Europeans, this area was inhabited by several plains nomadic tribes that were primarily hunter-gatherers. They utilized the area around Lake Tewaukon including the Lake's peninsula extensively. In 1867, the Government established the Lake Traverse Dakotah Sioux Reservation for the Sissetonwan and Wahpetonwan Dakota peoples. The boundaries included a portion of the Lake Tewaukon area. This area continued to be used for gatherings by Native American and white settlers. This Lake is still a popular spot today, especially for sightseeing, wildlife observation, hunting, and recreational fishing.

Tewaukon Wetland Management District

The Tewaukon Wetland Management District was established in 1960 to administer a variety of Service property interests in Richland, Ransom, and Sargent Counties. Enabling legislation includes: the Migratory Bird Hunting and Conservation Stamp Act (Stamp Act) and amendments, the Wetlands Loan Act and the Migratory Bird Conservation Act, for acquisition of areas for migratory birds and for "Waterfowl Production Areas." Waterfowl Production Areas are subject to the provisions of the Migratory Bird Conservation Act "... for use as an inviolate sanctuary, or for any other management purpose, for migratory birds...." Public Law 85-585 amended the Stamp Act to remove the inviolate sanctuary provision from WPAs. This is further defined in the Code of Federal Regulations (CFR) 50 as areas open to hunting, trapping, and fishing.

The Wetland District is comprised of Waterfowl Production Areas (fee title ownership), wetland easements, and grassland easements in Ransom, Richland, and Sargent Counties. Wetland easements and WPAs are purchased with Federal Duck Stamp dollars to protect migration and nesting areas for waterfowl. The Waterfowl Production Areas are fee title areas, from 20 to more than 1,000 acres in size, that provide migratory bird habitat. The Tewaukon Complex staff administers over 14,000 acres of these WPAs in the three Counties (See Map 2). Wetland easements have been purchased from willing landowners in the District over the past 30 years. In order to protect wetlands on described tracts from draining, filling, leveling, or burning, the Service has purchased a perpetual real property interest in them. District personnel are responsible for managing over 35,000 acres protected by wetland easements. In 1998, grassland easements were added to the District to protect prairie tracts from being converted to farmland. Grassland easements allow grazing at any time, and haying after July 15 to protect grasslands for wildlife habitat. To date, Complex personnel are responsible for administering more than 10,386 acres of grassland easements.

Tewaukon Complex Easement Refuges

Easement were purchased on Lake Elsie, Wild Rice and Storm Lake Refuges in 1934 as water and wildlife conservation projects. The Service divested Lake Elsie in 1998. The real property interest that the Service purchased in Wild Rice and Storm Lake Easement Refuges is limited, and is similar to the interest that was purchased on some of the tracts around Lake Tewaukon in the 1930's. On these three refuges, the Service purchased refuge easements which reserved the right to impound water, maintain no hunting areas for migratory birds, and serve as wildlife conservation demonstration areas.

Geographic/Ecosystem Setting

The majority of the Tewaukon Complex is located in the tallgrass prairie ecosystem while a small portion of western Ransom and Sargent Counties lie in the mixed-grass ecosystem (See Figure 3). Of all the prairie types, the tallgrass prairie is the most mesic with annual precipitation averaging 20 inches for southeastern North Dakota. Extreme seasonal temperatures range from -31 degrees to 100 degrees Fahrenheit. The tallgrass prairie is characterized by grasses, some over five feet tall, including big bluestem, Indian grass, switchgrass, prairie cordgrass, and a variety of forbs including golden Alexander, Maximilian sunflower, blazing stars, and leadplant. The mixed-grass prairie is characterized by grasses and forbs ranging from two to four feet tall including needle-and-thread grass, sideoats grama, little bluestem, coneflowers, aromatic aster and golden rod. These plant communities are not separated by distinct boundaries but transition from tallgrass to mixed-grass in the western part of the District. This boundary transition depends primarily on precipitation. Tallgrass plant species are commonly found on wetter sites and mixed-grass species are often found on higher, drier sites. Sites that have less than a 10 foot difference in elevation can have very different plant communities. Soils are also different on these sites. The majority of the Complex was farmed at one time but several isolated remnant prairie tracts still exist.

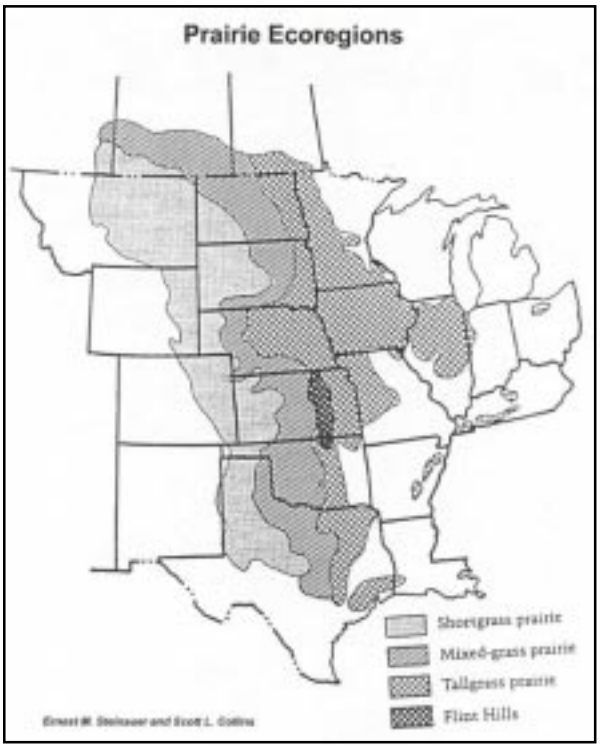


Figure 3. Prairie Ecoregions

The Complex is also located in the Prairie Pothole Region (See Figure 4). The wetlands in this region are among the continent's most biologically productive systems. They provide habitat for waterfowl, shorebirds, wading birds, amphibians, and a variety of other wildlife. The wetlands are important for maintaining and recharging groundwater supplies and improving water quality, storage of flood waters, and for trapping of sediments. The prairie pothole wetland complexes and their associated grasslands are an integral component of the prairie landscape, providing a wide array of ecological, social, and economic benefits. (U.S. Prairie Pothole Joint Venture Implementation Plan Update 1995). The Complex lands are located in several river watersheds including the Sheyenne, Red River of the North, and the Wild Rice River (Map 3). The Wild Rice River, a western tributary of the Red River of the North, flows through the Refuge. The Wild Rice River and several unnamed tributaries provide a water source for Refuge wetland impoundments that attract migratory waterfowl which rest, feed, and nest in the area.

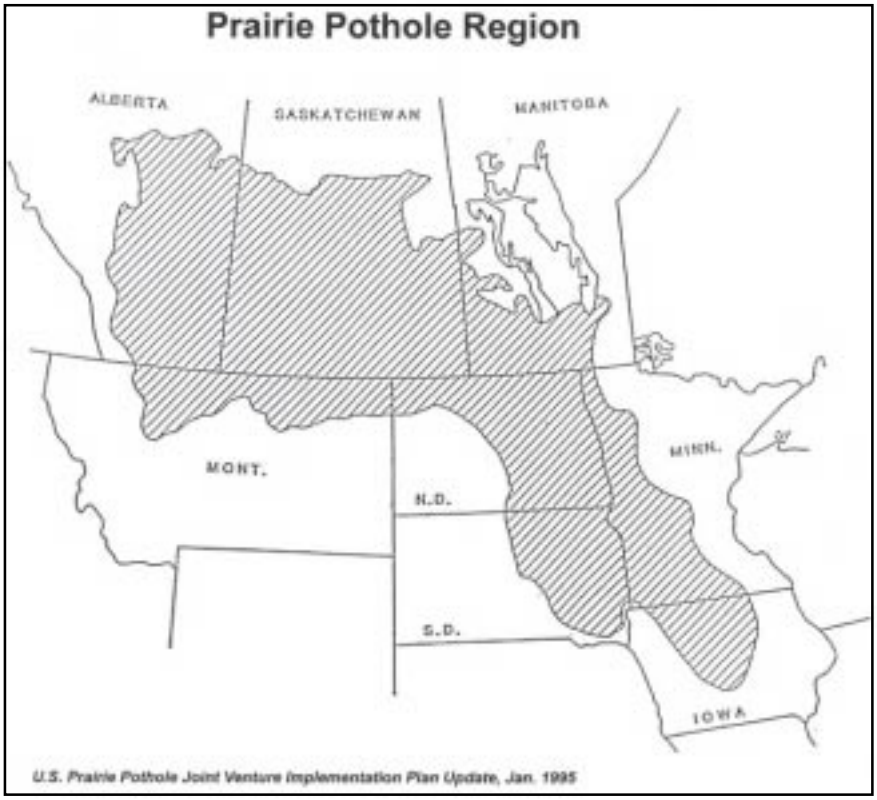


Figure 4. Prairie Pothole Region

The Tewaukon Complex is located on the eastern edge of the Central Migratory Bird Flyway and migrating waterfowl are strongly influenced by the James River Corridor. Birds from the Mississippi Migratory Bird Flyway, following the Lake Traverse-Minnesota River system also use the area. As a result, Tewaukon is a mixing point for birds associated with both the Central and Mississippi Flyways (See Figures 1 and 2).

Historical Resources, Cultural Values, and Uses

Four major glacial periods impacted the northern plains during the Pleistocene Age (Pielou 1992). The most recent was the Wisconsin glacial stage, which reached its maximum extent about 13 thousand years ago (Mayewski et al. 1981). All the dominant landscape features of the Prairie Pothole Region are products of that geological event including prairie wetlands or "potholes" and the rich glacial till soil that gave rise to the tallgrass prairie. The gently rolling landscape with a variety of depressions or potholes was carved out as the glaciers receded.

The tallgrass prairie was once an estimated 190 million acres (Bailey 1995) and stretched from southern Texas to southern Manitoba (See Figure 3) and was the dominant vegetation type across the eastern portion of the Great Plains during pre-settlement times (Steinauer and Collins 1996). Shallow, seasonal temporary and permanent wetlands dotted the grassy plain. Most of the original estimated 24 million acres were plowed for agricultural production shortly after European settlement. The Service's Habitat and Population Evaluation Team (HAPET) office, through the use of land satellite imagery, currently estimates that 275,000 acres of tallgrass prairie remain in North Dakota, a 94 to 95 percent loss. In the Tewaukon District, 118,700 acres are estimated to remain.

The Complex area has a rich history of use by prehistoric man. Three periods of occupation have been documented through archaeological excavation at the Refuge. The three main cultures described in the area include the Plains Archaic (5500-500 B.C.), Plains Woodland (500 B.C. - A.D.1000), and Plains Village (A.D. 1000 - 1780). Evidence indicates that the cultures using this area had an equestrian nomadic life style (Jackson and Toom 1999) which focused on subsistence big game hunting (especially bison) and the gathering of wild fruits and plants (Haberman 1978). Fish and bird (probably waterfowl) remains have been found in limited quantities in archaeological sites. Fruits and plants utilized included chokecherry, plum, and hawthorn (Haberman 1978), prairie turnip (a food staple), Jerusalem artichoke, Indian potato, wild onion, arrow leaf, pond lily, wild raspberry, and wild strawberry (Gilmore 1977, Weaver 1954). It is believed that eventually some of these cultures grew or traded for corn, squash, and beans as they became less nomadic.

Land Use and Wildlife Species Changes

Prior to the migration of European settlers, the Complex area was used by nomadic tribes primarily for subsistence. They consumed large ungulates (bison and elk), birds, and plants. Very little farming took place, and the majority of the grassland remained intact. As European settlers moved into southeastern North Dakota, farming was introduced and the highly productive cropping potential of the soils was discovered. Production crops in the area include wheat and barley, corn and soybeans. Sugar beets are planted in the rich Red River Valley. In more recent years, other crops have been introduced including sunflowers, canola, and higher cash yield crops that require irrigation such as potatoes and dry edible beans. Currently, the majority of the land in the District capable of producing a crop is farmed. The Conservation Reserve Program (CRP) administered by the U.S. Department of Agriculture has had a tremendous affect on the landscape for grassland birds. Cropland is enrolled in the CRP and is planted to grassland cover. Annual payments are made to the landowner for a period of 10 years. As of January 2000, over 144,000 acres of CRP grassland have been planted in the Tewaukon District. A few areas of native prairie still remain primarily due to poorer soil quality and cattle or buffalo are raised on these sites. See Map 4 for existing land cover types for the three Counties (Ransom, Sargent, and Richland).

> "The ground was covered (with bison) at every point of the compass, as far as the eye could reach, and every animal was in motion."
> - Alexander Henry 1801; Explorer along the Red River Valley

With the advent of European settlement, many of the grassland dependent wildlife species that historically used the area were either pushed out, hunted to extinction or severely reduced. Some of these species included: bison, elk, mule deer, antelope, grizzly bear, wolf, coyote, and sharptail grouse (Bailey 1926).

Originally, trees were found in the prairie but were located only along natural rivers and lakes. As more trees were planted for windbreaks and other sheltered spots such as culverts, abandoned buildings, and rock piles increased on the landscape, species of wildlife not previously found in the area, or found in limited numbers, increased. Red-tailed hawks, great horned owls, raccoons, woodchucks, striped skunks, white-tailed deer, and red fox populations increased in response to agricultural and settlement conversion. White-tailed deer are rarely mentioned by early explorers in the Red River Valley region (Bailey 1926) but are numerous today. Several species were introduced (either by natural events or by humans) from other countries and have spread to North Dakota or were directly released. These introduced species include house sparrows, ring-necked pheasants, gray partridge, carp, cattle egrets, and pigeons (rock doves). Giant Canada geese were originally found in the area but were hunted to extinction. They were reintroduced in the 1970's and are now found in record numbers.

Management by Unit

The planning team spent considerable time describing the variety of habitats on the Complex Units (Refuge, District, Easement Refuges) in order to explain the management actions needed to meet Complex goals. Each of the Management Units are presented here to provide a logical step-down from the broad purpose and vision statements to management decisions. They are also useful in this document as a comparison with the Environmental Assessment (EA) alternatives (Appendix F). The preferred alternative (the CCP) represents a course of action felt to best meet Complex objectives. Implementation of this alternative to meet its goals and objectives will depend on increased staffing and funding. For more information on funding, staffing, and implementation of the Plan, see the Implementation and Monitoring Section.

Management of the Tewaukon National Wildlife Refuge and the Tewaukon Wetland Management District is conducted out of the Refuge headquarters. General information on the Complex will be discussed jointly, and the Refuge and District specific information will be discussed in detail in their management sections.

Special Management Areas

The Tewaukon National Wildlife Refuge and Waterfowl Production Areas are insufficient in size and have a history of intense management and human impacts; for these reasons, they are not eligible to be included in the National Wilderness Preservation System. The Wild Rice River which flows through the Refuge has a history of human impacts and intense manipulation including Refuge impoundments, making it ineligible for a Wild and Scenic River Designation. Only two small areas in the Complex meet the criteria for a Research Natural Area designation. These two areas are on the Hartleben WPA and meet the criteria as an example of an important or significant habitat type (wet tallgrass prairie). The Service may consider this designation on these two sites in the future.

Interrelationships of Goals and Objectives

Complex goals and objectives are presented separately for the Refuge, District, and Easement Refuges for ease of understanding and reference. They are, however, not independent of each other. Goals and objectives for all of the management units must be considered when conducting management actions and programs. The Complex is a part of an ecosystem where actions in one area may affect other wildlife and plant species and their habitats. These relationships were considered when the goals and objectives for each unit were developed.

The habitat goals and objectives are the primary criteria which refuge managers will use to guide and evaluate their successes. Providing the habitat components that are needed to support Complex wildlife species is the focus of this plan. Habitat objectives are linked to wildlife objectives and strategies. Without healthy and diverse habitat, wildlife will not exist. Goals and objectives for wildlife, endangered and threatened species, and interpretation and recreation provide additional information for managers to refine specific actions and to assist in evaluating success of habitat management and use of the Complex by the public. In order for refuge managers to fully achieve the visions that have been developed for the Complex, these objectives should be viewed holistically and applied collectively. All objectives in this plan are for 15 years unless otherwise stated in the objective.

Tewaukon National Wildlife Refuge **(See Map 5 and 6)**

Purpose

Authorizing legislation for the Refuge initiated land acquisition and defined the Refuge purposes.

- For Refuge lands acquired under the Executive Order 9337, dated April 24, 1943, the purpose of the acquisition is to reserve and set apart certain public lands for the use of the Department of the Interior.
- For Refuge lands acquired under Public Land Order 286, dated June 26, 1945, the purpose of the acquisition is ...as a refuge and breeding ground for migratory birds and other wildlife....
- For Refuge lands acquired under the Migratory Bird Conservation Act, 16 U.S.C. § 715d, as amended, the purpose of acquisition is ... for uses as an inviolate sanctuary, or for any other management purpose, for migratory birds. 16 U.S.C. § 715d (Migratory Bird Conservation Act)

As part of the planning process, the Complex staff and planning team reviewed past national, regional, and Complex planning documents and current planning guidance. Using the legislation and plans, the planning team developed the following vision statement for the Refuge:

Vision: Tewaukon National Wildlife Refuge will be preserved, managed and enhanced as a part of the tallgrass prairie wetland ecosystem capable of supporting migratory birds and other native wildlife and plants for the benefit of present and future generations. The Refuge will provide an environment where a diversity of native tallgrass prairie, wetlands, plants, wildlife, and their natural processes can be discovered and explored. It will provide a place where people can learn about wildlife and their habitats and enjoy wildlife-dependent recreation.

Habitat Management

Goal: Preserve, restore, and enhance the ecological diversity of native flora, other grasslands and wetlands within the tallgrass prairie ecosystem.

> "The Herbage of this Plain in general [is] rich and luxuriant consisting chiefly of strong and succulent grass of many varieties. In the season of flowers a very large portion of this great plain presents one continual carpet of soft verdure, enriched by flowers of every tint."
> - General George Sibley, 1825 on an expedition through North Dakota

Grasslands

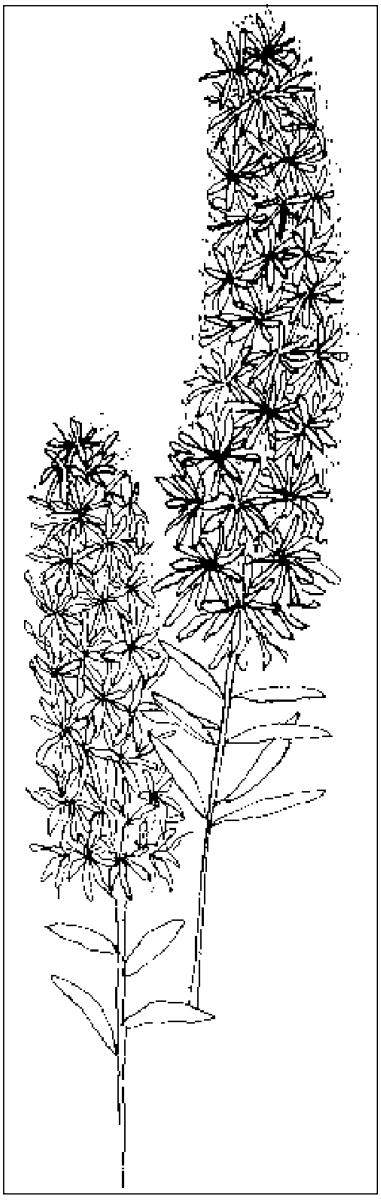
Native Prairie

The tallgrass prairie was once an estimated 190 million acres (Bailey 1995) and stretched from southern Texas to southern Manitoba (Figure 3). Tallgrass prairie was the dominant vegetation type across the eastern portion of the Great Plains during pre-settlement times (Steinauer and Collins 1996).

The tallgrass prairie ecosystem had frequent disturbances. Wildfires, caused by natural events like lightning strikes, burned the prairie at a frequency that varied widely but was estimated to be every two to five years (Axelrod 1985, Bragg 1982, Bragg and Hulbert 1976). Lightning was the primary cause of these wildfires and would have been most common in mid-summer (Bragg 1982). Fires that were set intentionally or accidentally by Native Americans increased the frequency of fire (Pyne 1994). Bison, elk, mule deer, and a few white-tailed deer made up the larger herbivores. Pocket gophers, ground squirrels, and insects (ants, grasshoppers) made up the smaller herbivores (Bailey 1926). Large periodic climatic events including drought, hail, tornados, and flooding also shaped plant communities.

All these forces, wet periods, dry periods, herbivory, and fire shaped the tallgrass prairie into a complex and diverse floral ecosystem. The plant species composition of the tallgrass prairie was dominated by warm season native grasses such as big bluestem, switchgrass, Indian grass intermixed with little bluestem, sideoats grama, blue grama, prairie cordgrass and western wheatgrass. Common cool season grasses included porcupine grass, needle-and-thread, June grass, and green needle grass. Wildflowers were plentiful and bloomed from early spring into late fall. The early spring color of blue-eyed grass and white lady's slipper orchid turned to the orange of the prairie lily and white of the meadow anemone of early summer. Late summer brought on a dazzling display of purple blazing stars, and purple prairie clover and gave way in the early fall to the bright yellow of Maximilian sunflower, sneezeweed, and the delicate white petals of nodding ladies tresses. The sea of grass, as the prairie was described by some early travelers, was frequently interrupted by a large number of wetlands (120-160 basins/square mile) in a variety of sizes and depths. The plants associated with the wetlands added to the vegetative diversity of the tallgrass prairie. Woody species such as American elm, red elm, white ash, box elder, willow, bur oak, chokecherry, and buffaloberry were limited to stream and river corridors and some wetter areas protected from disturbance (Bailey 1926). As many as 300 species of plants were thought to be components of this ecosystem.

The present plant community classification used by the North Dakota Natural Heritage Program is a refinement of Heidel's (1986) Classification. The following types of plant communities of the tallgrass prairie ecosystem are described by indicator species in Heidels 1986 Classification. These indicator species will provide guidance to refuge managers on existing prairie health and a measure for prairie restoration success. Prairie remnants occur of all these plant community types represented on the Complex.



Blazing Star, Cindie Brunner

Wet Prairie

This type is found in temporary wetlands, level low areas and in bands surrounding deeper wetlands. It is dominated by prairie and wetlands grasses and some sedges. Forbs may be moderately abundant to sparse. Dominant species may include prairie cordgrass, switchgrass, and northern reed grass. Forbs include Maximilian sunflower, prairie dogbane, and golden alexanders.

Wet Mesic Tallgrass Prairie, Sand

This type is found in wet to mesic soils. It may grade into wet prairie on wetter areas and mesic tallgrass prairie on drier areas. This prairie type is dominated by tall, warm-season grasses with forbs that are generally tall and showy. The sand subtype is subject to greater moisture extremes and may have lower a diversity of forbs. Common grass species include switchgrass, big bluestem, northern reedgrass, Baltic rush, and Indian grass. Forbs may include tall blazing star, wild lily, white camas, Maximilian sunflower, Canada anemone, and black-eyed Susan.

Mesic Tallgrass Prairie, Sand

These types are found on relatively level areas of sand, lacustrine deposits, or till. These types include tall grasses such as big bluestem and Indian grass in most occurrences. On drier sites, mid-height grasses, such as porcupine grass and little bluestem, increase in importance. The sand subtype may have prairie sandreed in moderate amounts. Forbs are usually diverse and may be abundant locally. Additional grasses may include switchgrass and prairie dropseed. Some common forbs include blazing star, leadplant, stiff goldenrod, hoary puccoon, showy milkweed, white prairie clover, and stiff sunflower.

Central Mesic Tallgrass Prairie

Found on level to rolling topography or lower river valley slopes. Less precipitation than mesic prairie in the eastern part of the State and may contain more mixed-grass prairie components. It includes tall grasses such as big bluestem and Indian grass in most occurrences. Mid-height grasses such as porcupine grass and little bluestem are also important. Forbs are usually diverse and may be abundant locally. Additional grasses may include porcupine grass, green needle grass, and sideoats grama. Some common forbs include narrow-leaved blazing star, leadplant, stiff golden rod, hoary puccoon, showy milkweed, white prairie clover, and stiff sunflower.

Dry Mesic Tallgrass Prairie

This type is dominated by mid-height grasses. It is found on rolling to rough topography with varying slopes. Soils are generally well-drained to excessively drained. The till subtype of this community is commonly found on hillsides and river valley slopes. Common grasses include little bluestem, porcupine grass, June grass, sideoats grama, and Indian grass. Prairie sandreed is common and sand bluestem is occasional on sand substrates. Forbs can be abundant and include narrow-leaved blazing star, yellow coneflower, stiff sunflower, alum root, purple coneflower, thimbleweed, prairie smoke, and pasture sage. Sub-shrubs are common and include leadplant, prairie wild rose, and buckbrush.

Mesic Mixed-Grass Prairie

This type occurs generally on glacial till of hillsides, slopes, and river valleys. Common grasses include: green needle grass, bearded wheatgrass, western wheatgrass, and porcupine grass. Common forbs are similar to those in dry-mesic tallgrass and may include purple coneflower, alum root, stiff sunflower, narrow-leaved blazing star, and yellow coneflower. Shrubs and sub-shrubs include leadplant, prairie wild rose, and buckbrush.

The Refuge lies along the western edge of the tallgrass prairie ecosystem. Most of the Refuge was farmed prior to its establishment, and only 616 acres of native prairie remains. Most of the native prairie remaining on the Refuge can be categorized as Wet Prairie, Central, and Dry Mesic Tallgrass Prairie types. Historically, only the very wet or lands inaccessible to farming remained uncropped. Management history of the sites included prescribed fire, used periodically in the 1970's to the present time and limited haying. Little to no grazing has occurred on these areas.

Prescribed Burning and Wildfires

The primary reason the native prairie is not in better condition is the lack of periodic disturbance (Service Ecological Services Botanist, Kathy Martin 1993; Barbour et al. 1987; Duebbert et al. 1981). Grassland species of the northern great plains evolved under periodic disturbance and defoliation from bison and fire (Eldridge 1992; Barbour et al. 1987). This periodic disturbance is what made the prairie healthy and a place of enormous diversity for thousands of years. Defoliations can be mimicked to some degree by the periodic use of prescribed fire, grazing, and to a lesser extent, haying. Fish and Wildlife Service botanists recommend that a burning and/or mowing regime be used to enhance the tallgrass and low prairie communities (Kathy Martin 1993). Periodic rejuvenation using fire, grazing or haying is also recommended for planted cover in order to maintain optimum vigor (Duebbert et al. 1981). Prescribed fire on the Complex has typically been carried out in the spring and fall. More work is being done to incorporate summer burning into the rotation to mimic historic fire occurrence.

Since the 1960's, Complex managers have used prescribed fire to restore, change, and maintain the diversity in plant communities. Prescribed fire is also used to reduce hazardous fuels on Complex grasslands. Hazardous fuels have six inches or more of accumulated dead litter material. A large amount of litter can cause additional control problems for fire suppression efforts. Reducing these high amounts of litter can reduce fire intensity and make wildfires easier to control. The Tewaukon Complex has an average of one wildfire per year. Human caused fires account for 99 percent of all wildfires on the Complex. Wildfires on the Complex are usually caused by equipment or fires escaping from adjacent private land.

Fire is an important grassland management tool that can be utilized to accomplish Complex habitat management objectives. Fire is also a tool that can quickly destroy Federal or private equipment, buildings, and property and hurt or kill those that work with it.

The following two objectives recognize that prescribed burning and wildfires play an important role in Complex habitat management. The objectives also recognize that fire inherently has human health, social, and economic risks that other management tools do not.

Objective: Utilize prescribed fire, in an ecosystem management context, applied in a scientific way under selected weather and environmental conditions, on approximately 2,500 acres of grasslands and 50 acres of wetlands annually to accomplish habitat management objectives.

Strategies:

- ✓ Maintain a current Complex Fire Management Plan and implement the Plan to accomplish resource management objectives.
- ✓ Conduct all fire management programs in a manner consistent with applicable laws, policies, and regulations.

Objective: Protect life, property, and other resources from wildfire by safely suppressing all wildfires on Complex lands.

Strategies:

- ✓ Use strategies and tactics that consider safety and values at risk.
- ✓ Use prescribed fire to reduce hazardous fuels on Complex lands to reduce the intensity and favorable conditions for wildfires.

More detailed information on wildfire suppression and prescribed burning methods, timing, and monitoring can be found in a step-down Complex Fire Management Plan.

Native Prairie Management

Unlike most of the habitat management objectives described in this plan, the following objective was not fundamentally driven by wildlife needs. The planning team recognized that few remaining tracts of tallgrass prairie are within the area that historically occurred in this ecosystem. Some of these remaining tracts occur on Complex lands. These objectives recognize managing and maintaining this rare and unique habitat and assumes prairie associated wildlife will use these areas.

Objective: Preserve, restore, and enhance the diverse native floral communities on 616 acres of the Refuge's existing native prairie so that greater than 75 percent of the plant community is composed of indicator species that are suitable for each site using Heidel's classification (Heidel 1986).

Strategies:

- ✓ Conduct floristic surveys on existing native prairie on the Refuge to establish baseline information on species composition to use for comparison following management techniques.
- ✓ Develop specific monitoring techniques to annually evaluate these native prairie areas in a step-down Monitoring Plan.
- ✓ Apply management tools (prescribed burning, mowing, grazing, interseeding, chemical treatment, etc.) as appropriate.

Several nonnative plant species exist in Refuge native prairie tracts including: leafy spurge, Canada thistle, Kentucky bluegrass, smooth brome, Canada thistle, yellow and white sweetclover, and Russian olive trees. These nonnative plant species can out-compete native plant species when frequent disturbances (grazing and burning) and nonnative plant control methods are not conducted. The Refuge uses a variety of nonnative plant control methods including burning, mowing, chemical, and biological. Without disturbance and nonnative plant control, these species will increase and crowd out the native flora making the prairie unattractive to many of the prairie butterflies and grassland migratory birds.

Objective: Reduce by 15 percent (measured as canopy cover) nonnative plants (including leafy spurge, Canada thistle, Kentucky bluegrass, smooth brome, sweet clover, Russian olive trees) in the 616 acres of Refuge native prairie.

Strategies:

- ✓ Use a variety of techniques and tools including chemical, mechanical and biological methods, prescribed burning, and grazing.
- ✓ Continue to evaluate weed control methods for effectiveness and gather information on methods developed in the future.

Tallgrass Prairie Management Approach

In an effort to develop a habitat-based approach to managing tallgrass prairie, U.S. Geological Survey and Refuge staff worked to develop management strategies that would guide grassland management on the Refuge and District. The strategies published as a report provide information to guide management efforts to maintain or restore native communities within the tallgrass prairie on the Tewaukon Complex. It was not feasible to provide information on all the species (plant and animal) that live in the tallgrass prairie ecosystem. This approach was chosen to manage for sensitive species (indicator species) because many of the environmental stresses are reflected in these species population levels. Indicator species that were chosen include four migratory grassland birds (upland sandpiper, grasshopper sparrow, northern harrier, and bobolink) and three rare prairie butterflies (Dakota skipper, regal fritillary, and powesheik skipper).

The criteria used for selecting the bird species were:

- Select species that are associated with tallgrass or mixed/tallgrass prairie.
- Select species of management concern using lists from the Audubon Society Watchlist, Fish and Wildlife Service Nongame Migratory Birds of Management Concern List or North Dakota Species of Special Concern (Berkey et al. 1993).
- Select species for which the Complex is in the central part of the species' range, not on the periphery based on Breeding Bird Survey (BBS) maps, Grassland Bird Home page (Sauer et al. 1995), and North Dakota breeding bird maps (Stewart 1975).

Many species of invertebrates are excellent indicator species because their habitat needs are very restrictive (Erhardt and Thomas 1991). For example, some butterflies can only be found in high quality prairie habitat with specific plants for nectar and larval food resources including Dakota skipper and powesheik skipper. Some invertebrates are also sensitive to local habitat changes (addition of roads, houses, wetland drainage, cropping of prairie) and processes including grazing and fire (Schlicht and Orwig 1998). For these reasons, three rare prairie butterflies (Dakota skipper, regal fritillary, and powesheik skipper) were also added into the model. As more information and research is conducted on these three butterfly species, the model will be adapted to reflect any new or better information.

The following paragraphs are taken from "A Habitat-Based Approach to Management of Tallgrass Prairies" (Schroeder and Askerooth 2000).

> In tallgrass prairie habitats, grassland birds are of particular concern because they have exhibited steeper, more consistent declines during the past 25 years than any other group of North American birds (Knopf 1995). Conservation of native prairie birds and other wildlife depend on a variety of successional and diverse habitat conditions within a large block of grass (Skinner et al. 1984; Renken and Dinsmore 1987; Volkert 1992; Howe 1994; Madden 1996). Howe (1994) recommends management for tallgrass assemblages that are diverse, different from each other, and dynamic. Skinner et al. (1984) in a Missouri grassland study suggests that management should provide a wide range of grass cover heights during all seasons for the best wildlife habitat. Madden (1996) emphasizes the need to manage for all stages of prairie succession to provide for maximum grassland bird diversity over decades of management. The habitat affinities of grassland bird species are diverse, and species respond to similar conditions in different ways (Wiens 1969; Herkert 1994).
>
> The species richness of grassland birds is positively associated with the size of the grassland area and large prairies are important for the conservation of prairie bird populations (Herkert 1994). Herkert (1994) notes that both area and vegetation structure significantly affect grassland bird populations. Large areas that are uniform in plant composition and structure may have less value than several smaller areas with distinct and diverse vegetative components (Ryan 1986).

The most abundant introduced Eurasian grasses (i.e. Kentucky bluegrass and smooth brome) tend to be more uniform in height and density than native vegetation (Wilson and Belcher 1989).

Several studies suggest that grassland birds are experiencing large population declines due to the loss of extensive areas of grasslands (Samson 1980, Herkert 1994, Vickery et al. 1994). The useable area for some grassland bird species is made smaller by the presence of trees in the grassland or adjacent to the grassland. The shape of the grassland area and its perimeter characteristics are as important to grassland birds as the size of the grassland area (Helzer and Jelinski 1999). Grassland birds that nested closer to wooded edges had higher predation rates on the birds and their nests and increased parasitism of their nests (Johnson and Temple 1986 and 1990, Burger et al. 1994). Some grassland species avoid nesting near patch edges (including adjacent trees, shelterbelts etc.) (Johnson and Temple 1986, Delisle 1995, Helzer 1996).

This research helped the planning team develop the next objective that addresses the management of contiguous blocks of grassland cover for the benefit of grassland nesting migratory birds and prairie butterflies. Six sites were chosen to implement our tallgrass prairie management approach (See Map 7). These sites were selected because they included tracts of native prairie, were in areas with minimal woody vegetation greater than one meter tall, and had access for management. Several of the sites have fields of tame grass, composed primarily of smooth brome, warm season native grass plantings, and a couple of crop fields. Two of the tracts are composed entirely of native prairie that have never been broken for crop production; the other sites have smaller tracts of native prairie. If this management approach proves to be an effective method of habitat management and if additional funds and staff become available, the management will be expanded to additional areas on the Refuge.

This objective recognizes that the establishing Refuge legislation describes setting lands aside as a breeding ground for migratory birds including grassland migratory birds. Under management, these prairie pieces should support a diversity of vegetation structure and flowering plants needed by prairie dependent butterflies.

Objective: Manage the six Prairie Focus Areas (South Pool 4, Krause, North Pool 2, Southwest Sprague Lake, NE 1/4 Section 36, and Southeast of Railroad tracks - See Map 7): 1) to achieve an area of contiguous grassland (greater or equal to 160 acres) that is greater than 50 meters from woody vegetation (greater than one meter tall); 2) contain a variety of vegetative heights on the area with 20 percent of the vegetation height ranging from 10 - 20 centimeters, 20 percent ranging from 20-30 centimeters, and 20 percent greater than 60 centimeters; 3) to increase native floral diversity so that greater than 75 percent of the vegetative composition is composed of indicator species of the dry mesic tallgrass, central mesic tallgrass prairie, wet prairie, mesic tallgrass prairie climax communities (Heidel 1986).

Strategies:

- ✓ Provide the critical limiting habitat factors outlined in the “Habitat-Based Approach to Management of Tallgrass Prairie ” (Schroeder and Askerooth 2000) for a variety of vegetative heights, and no woody vegetation greater than one meter tall on the six sites and 75 percent of vegetative composition composed of indicator species (Heidel 1986). Include specific management details of these areas in a step-down management plan.
- ✓ Develop a detailed Monitoring Plan for the six sites.
- ✓ Annually evaluate the vegetation using methods and techniques developed in the Monitoring Plan for the six sites and apply management tools (prescribed burning, mowing, grazing, interseeding, chemical treatment, etc.) as appropriate to provide the limiting habitat requirements for migratory grassland birds and rare butterflies.

Introduced/Planted Cover

Dense Nesting Cover

Dense nesting cover (DNC) is comprised of one to two species of wheatgrass, alfalfa, and sweet clover and planted to provide dense nesting habitat for ground nesting birds, especially waterfowl. Duebbert et al. (1981) reported that a minimum reading of two decimeters total visual obstruction is required in mid-April to provide the cover preferred by waterfowl for nesting in the Prairie Pothole Region. Thick cover helps conceal hen ducks from predators. DNC stands once established, must receive management treatments every few years to maintain optimum quality (Duebbert et al. 1981).

The Refuge has approximately 1,348 acres of DNC. DNC is one of the primary grassland covers that Complex managers historically established on previously farmed uplands in order to provide nesting cover for migratory birds. DNC was primarily developed as a waterfowl nesting cover because of the international importance of the Prairie Pothole Region to nesting waterfowl. Haying has historically been the primary tool to rejuvenate DNC fields. Every 10 to 15 years the fields must be broken up and farmed for approximately three years to get rid of the smooth brome and Kentucky bluegrass that invaded them. These field are usually reseeded to DNC.

The planning team recognized that most of the grassland dependent birds that breed on the Refuge select nesting sites because of vegetative structure and composition that provides cover and food requirements. Introduced/ planted cover objectives were developed to try and ensure that vegetative cover on these sites remains attractive or is improved. Over a 15 year period, the staff thought that maintenance of 80 percent of existing DNC on the Refuge was an accomplishable objective.

Objective: Maintain 80 percent of DNC fields with two decimeters visual observation obscurity to provide optimal nesting habitat for ground nesting ducks (mallards, teal, etc.) until the fields can be seeded back into native plant species.

Strategies:

- ✓ Annually monitor a selected sample of DNC fields on the Refuge for visual obscurity using the Robel pole method.
- ✓ Apply management tools (prescribed burning, haying, grazing or interseeding) as appropriate to maintain optimal nesting habitat for ground nesting ducks.

Planted Warm Season Natives and Other Grasslands

The Refuge has approximately 739 acres of planted warm season native grass fields composed of three to four species including big bluestem, little bluestem, Indian grass, and switchgrass. Tewaukon nest records for the past nine years indicate that these stands do not attract nesting waterfowl because they are low in species diversity. The Refuge also has over 1,199 acres of introduced grasses consisting primarily of smooth brome and Kentucky bluegrass. These fields were generally planted to some other cover type, but have been invaded. If these fields are managed with fire and haying, they do provide marginal nesting cover for species like blue-winged teal but do not offer the structure preferred by many of the other ground nesting birds like bobolinks, mallards, and gadwalls. Combined with the rest of the objectives in the Refuge and District, 600 acres could be converted to a diverse native floral community.

Objective: Over the next 15 years convert 600 acres of planted cover (DNC, introduced grasses, and warm season native grass plantings) to a diverse native floral community composed of 75 percent of the climax species identified in Heidel's Classification (1986).

Strategies:

- ✓ Gather existing information and initiate research on native plant community restoration, interseeding techniques, chemical, and mechanical treatments.
- ✓ Develop site specific restoration plans, funding sources, and a Monitoring Plan; then begin restoration efforts. Apply management tools (prescribed burning, mowing, grazing, interseeding, chemical treatment, etc.) where appropriate.
- ✓ Annually evaluate fields through visual observations and treat nonnative species such as smooth brome, Kentucky bluegrass, Russian olive, thistle, and leafy spurge by using fire, grazing, chemical, mechanical, and biological control.

"The entire face of the country is covered with these shallow lakes, ponds and puddles, many of which are, however, dry or undergoing a process of gradual drying out."
- Charles Froebel Traveled with General Alfred Sully's expedition in 1865 in Dakota Territory.

Wetlands

The Prairie Pothole Region encompasses a 300,000 square mile region (Figure 4) and includes 25 million wetlands of various types (U.S. Prairie Pothole Joint Venture Board 1995). In North Dakota, a great majority of these wetland basins are less than 15 acres (Stewart 1975). Wetlands are lands where saturation with water is the dominant factor determining the nature of soil development and the types of plant and animal communities living in the soil and on its surface (Cowardin et al. 1979). Within a prairie wetland, water depth and duration of ponding determines the distribution of plant species.

In the Classification of Wetlands and Deepwater Habitats of the United States by Cowardin et al. in 1979, wetlands are described by vegetation, water regimes (the length of time water occupies a specific area), and water chemistry. Description of prairie potholes are listed below.

- Temporary wetlands: a shallow depressional area which holds water from spring runoff, usually late May to early June. Temporary wetlands frequently reflood during heavy summer and fall rains. Characterized by smartweed, rushes, sedges, and grasses.
- Seasonal wetlands: a depression which holds water in normal years from spring runoff until mid-July to early August. Commonly refloods with frequent or heavy fall rains. Characterized by smartweed, rushes, sedges, and some cattails.
- Semipermanent wetlands: a well-defined depression which holds water in normal years throughout the summer. Generally only go dry in years below normal runoff and precipitation. Characterized by a predominance of cattail and bulrush vegetation with scattered open water areas.
- Permanent wetlands: a well defined basin which holds water throughout the year. Only go dry after successive years of below normal runoff and precipitation. Typically have a border of aquatic vegetation (usually cattails) and a large open water area in the middle.
- Fens, or alkaline bogs, are distinguished separately because they are saturated with water. They are dominated by grasses and sedges.

Prairie wetlands are dynamic in nature and go through various sequences or stages. This process is influenced by alternating wet and dry periods. These wet and dry periods can occur weekly, yearly, or last for several years. Parts of an individual wetland may be in all or one of the stages listed below at the same time. Temporary wetlands will go through all of the stages but may not reach some of the higher water depths. It is this alternating of wet and dry periods that make wetlands productive. Wetlands that do not go through these stages lose productivity, and decline in biotic and wildlife diversity.

Description of Stages:

- Dry - Expanses of bare mud flats characterized by annual vegetation becoming replaced by perennial vegetation, the longer the wetland is in the dry stage.
- Shallow - Water depth of approximately one inch to two feet. Some emergent vegetation present.
- Mid-depth - Water depth of approximately two to four feet. Open water is interspersed with emergent vegetation.
- Open water - Water depth greater than four feet with some emergent vegetation around the edges.

Wetlands are also influenced by other natural forces such as fire and wildlife impacts. During long periods of drought, prairie fires would burn the dry organic layer of wetlands removing years of accumulated sediments. Large herds of bison would trample the surrounding area and vegetation around wetlands. Bison would lie down and create depressions or wallows in wetland basins. They would remove soil, sediments, and plant seeds and take dust bathes in dry wetland basins (Steinauer and Collins 1995). Bison wallows were three to five meters (10 to 16 feet) in size (Collins and Barber 1985) and would be free of vegetation. The large amount of hoof action would create exposed soil areas where seeds were planted as they were pushed into the soil. Bison also helped to decrease wetland sedimentation by removing soil during wallowing on their thick shaggy coats (Costello 1969). Muskrats also impact wetlands by removing cattails and rushes which create open water areas.

Managed Wetlands

The Refuge receives water from four sources (see Map 5 and 6):

1) Wild Rice River
2) LaBelle Creek
3) Tributary to Hepi (Cloud's) Lake
4) Tributary to Sprague Lake

The Refuge has 38 semipermanent and permanent wetlands with water level management capabilities on both Tewaukon and Sprague Lake Units.

Historically, water management in these 38 wetlands has maintained approximately three to four feet of water throughout the year. Water was usually passed through the system in the spring; management levels were reached in late spring as snow melt runoff slowed. If possible, wetlands were refilled in the fall to store water in case of low precipitation in the winter and spring. Drawdowns, though planned, were infrequent, short-term and often difficult to do with water control structure capabilities. Often a plan to dry out a managed wetland could not be achieved because local runoff would refill the basin. Evaporation is the main option available to de-water some Refuge pools. With a flow through system, outlet pool elevations are often higher than the bottom of the pool which makes de-watering through the structures in high water years impossible. Past management strategy could be characterized as achieving an average which did not include the natural large fluctuations that normally occur in prairie wetlands.

The planning team recognized the need to refine water management techniques so managed wetland conditions would more closely correlate with the natural processes of drying and flooding. The planning team also recognized that objectives needed to be developed that would help managers collect better water use and water quality data on managed and non-managed wetlands. The planning team felt that a mixture of 20 percent of each stage (dry, shallow, mid-depth, open water) across Refuge managed wetlands and a remaining 20 percent reserve to provide habitat that is deficient in the watershed, was a way to quantify water management objectives. For example, when watershed wetland conditions are dry, the remaining 20 percent (reserve) of Refuge pools will be managed to provide wet stages.

Objective: Annually provide for approximately 20 percent in dry, 20 percent in shallow, 20 percent mid-depth, and 20 percent open water wetland conditions on Refuge managed wetlands and manage the remaining 20 percent as a reserve to adjust to local climatic and habitat conditions.

Strategies:

- ✓ Develop a step-down Water Management and Monitoring Plan for Refuge managed wetlands. Continue to provide annual Water Management Plan/Water Use Reports for Regional Office review.
- ✓ Utilizing water level manipulations, alter water levels within and amongst years to assure each unit proceeds through each of the wetland categories during a three to five year period.
- ✓ Utilize fire manipulation to alter vegetation structure and mechanical methods to alter vegetation and disturb soil as needed.
- ✓ Manipulate the 20 percent reserved category to meet habitat deficiencies detected within Red River watershed by annually assessing habitat conditions using information from the National Weather Service and the Habitat and Population Evaluation Team (HAPET) office.
- ✓ Manage Tewaukon and Sprague Lakes as open water habitats for migratory waterfowl rest areas.

Objective: Reduce nonnative reed canary grass invasion in wetlands by 10 percent annually.

Strategy:

- ✓ Apply management tools (prescribed burning, mowing, grazing, interseeding, chemical treatment, etc.) as appropriate to reduce invasion of nonnatives.

Water Rights

Water rights for the Tewaukon NWR were established in 1934 pursuant to Section 8270 (repealed 1943) of the Compiled Laws of North Dakota for the year 1913. On August 30, 1937, plans and data were submitted documenting the United States' right to use waters tributary to each dam to its spillway capacity, and after each dam was filled to spillway capacity, an additional amount of water to maintain this level to stimulate aquatic vegetation for migratory waterfowl foods. In 1964, the Refuge was issued three water right permits authorizing use of additional water needed as a result of developments under the Refuge Annual Master Development Plan. (See Appendix D for a more complete description of water rights).

The State Engineer's Office has raised questions about the adequacy of the Refuge's water rights. The Service has agreed that it will review water rights and management on all North Dakota refuges and provide updated information on capacity and water use. Tewaukon NWR will be one of the first to be evaluated in this effort. Additional data collection capabilities on the Refuge need to be developed in order to more accurately record water use. Water use is currently calculated using acre-feet tables that correspond to water elevations on Refuge pools. Each year a report is compiled on water use and proposed management in the Refuge Water Management Plan and forwarded to the North Dakota State Engineer. This report meets the North Dakota statutory requirement for an annual operations plan for all impoundments containing 1,000 acre-feet or more.

Objective: Protect existing water rights and clarify water rights needs on Refuge wetlands in order to provide long-term protection of water resources.

Strategies:

- ✓ Improve Refuge water use database by installing data loggers on four dams and three major tributaries of the Wild Rice River and gages in every managed pool on the Refuge.
- ✓ Document Refuge water use and maintain records annually.

Water Quality

Two water quality surveys have been conducted in the Wild Rice Watershed (Map 3). The first was conducted in 1996, by the North Dakota Department of Health's Water Quality Division and the Wild Rice Soil Conservation District (SCD). The goal of the study was to implement an assessment project in order to gather sufficient data to document water quality trends, quantify pollutants, and identify potential nonpoint source pollution within the Wild Rice Watershed. The sampling was done for one year, 1996. Water quality variables monitored included: total ammonia as nitrogen, conductivity, total phosphorus, nitrate plus nitrite as nitrogen, total Kjeldahl nitrogen, total suspended solids, and fecal coliform bacteria. Six monitoring stations were located upstream from the Refuge, one was on LaBelle Creek and one was located downstream of Lake Tewaukon. The station downstream from Lake Tewaukon had the highest net yield for all the water quality variables. The report attributed part of this to the accumulation of excessive nutrients from upstream sources. Controlling upstream pollution and nutrient sources is the best way to decrease the amount of nitrates and sediments from entering the Refuge.

Since 1996, a water quality survey has been conducted by Sisseton-Wahpeton Sioux Tribe's Office of Environmental Protection. The goal of this study was to enhance and protect the Tewaukon National Wildlife Refuge by ultimately setting water quality standards. Data has been collected for the last four years. The 1998 raw data was received and currently the Refuge is waiting for the report on the study's findings.

The planning team developed the following objective to improve the water quality of the Wild Rice River as it comes into the Refuge. This would be accomplished through cooperative private land agreements to established vegetative buffers and riparian areas designed to improve water quality for aquatic plants, wildlife, and fish. The planning team felt that in 15 years a reduction of nitrates and sediments by 15 percent could reasonably be accomplished.

Objective: Reduce annual Wild Rice River watershed nitrate inputs and sediment loads as it comes into the Sprague Lake Unit, and LaBelle Creek as it enters the Tewaukon Refuge Unit by 15 percent.

Strategies:

- ✓ Determine the parameters to monitor water quality in the Wild Rice River and LaBelle Creek as they enter the Refuge and implement a water quality monitoring program.
- ✓ Work with Department of Health to conduct a land-use survey to further pinpoint the land-use practices that are influencing the water quality of the Wild Rice River Watershed. This survey should include a stream/riparian area assessment including current vegetation conditions and composition and land-use practices. Utilize the land survey to implement a Clean Water Act Section 319 Watershed Cleanup Project.
- ✓ Develop or use existing Partners for Wildlife Program and USDA programs to partner with upstream landowners who farm/ranch along the River to establish vegetative buffer zones, reduce livestock impacts along the Wild Rice River, and decrease sediment loads and contaminants.
- ✓ Partner with U.S. Department of Agriculture buffer strip program to establish stabilizing and filtering vegetation along Wild Rice River and LaBelle Creek to prevent erosion and sedimentation.
- ✓ Work with landowners to restore riparian vegetation and wetlands along the Wild Rice River and LaBelle Creek in order to decrease sediment loads, contaminants, and help reduce flooding.

Non-Managed Wetlands

The Refuge has over 1,500 acres of non-managed prairie wetlands. These wetlands are diverse in nature and include temporary, seasonal, and semipermanent types. The majority of these wetlands are surrounded by grassland cover while a small portion are found in cropland. Not much information has been gathered about their health or condition.

The wetlands in Refuge cropland are subject to varying degrees of siltation. Cultivating wetland basins (disturbing the vegetation) has contributed to soil erosion. Wetlands in agricultural fields receive more sediment from surrounding areas than wetlands surrounded by grasslands (Gleason and Euliss 1998). Other wetland impacts include increased turbidity, sediments, and a decrease of invertebrate production, a food source for other wildlife (Gleason and Euliss 1998). One of the control measures that could reduce sediment in agricultural fields is vegetative buffer strips around wetland basins (Dillaha et al. 1989). A need exists for more work on methods to restore pool depth in silted-in wetlands, evaluation of sedimentation effects on wetland functions, and effective ways to reduce sediment inputs (Gleason and Euliss 1998).

Five common nonnative plants that have invaded Refuge non-managed wetlands are smooth brome, Kentucky bluegrass, leafy spurge, Canada thistle, and reed canary grass. No purple loosestrife has been observed on the Refuge. These nonnative plants can dominate a wetland and decrease overall plant diversity.

Objective: Determine the quality and health parameters of non-managed prairie wetlands in order to preserve their natural productivity, longevity, and function.

Strategies:

- ✓ Gather baseline information on Refuge wetland conditions and identify potential and existing threats.
- ✓ Implement management methods to reduce or eliminate threats to wetland productivity and function.
- ✓ Coordinate with County Weed Boards and document control efforts involving nonnative wetland species such as purple loosestrife on and off Service lands.

Objective: Reduce nonnative plant (Kentucky bluegrass, leafy spurge, Canada thistle, and reed canary grass) invasion in wetlands by 10 percent annually.

Strategy:

- ✓ Apply management tools (prescribed burning, mowing, grazing, interseeding, chemical treatment, etc.) as appropriate to reduce invasion of nonnatives.

Native Woodlands

Historically Refuge woody vegetation occurred along riparian corridors and around some wetlands. Bailey (1926) states that these southeastern North Dakota riparian woodlands were composed of American elm, red elm, white ash, box elder, willow, bur oak, serviceberry, chokecherry, buffaloberry, and rose. Today native woody vegetation is still present on the shores of Lake Tewaukon, on the peninsula that juts out into the Lake, and along LaBelle Creek.

Managing native woodlands has had little emphasis in previous Refuge planning efforts. The planning team recognizes that while this habitat component makes up a very small portion of the Refuge land base, it is important habitat for thrushes, orioles, warblers, and other tree nesting birds that reproduce on the Refuge. The establishing Refuge legislation language sets aside this area as a breeding ground for migratory birds. Managers need to have a better plan for the perpetuation of the native tree resource and the migratory birds that breed there.

Objective: Maintain native woody vegetation on the Lake Tewaukon peninsula, on the shore of Lake Tewaukon, and along LaBelle Creek corridor to provide roosting habitat, food, and cover for migratory and resident birds and other wildlife.

Strategies:

✓ Coordinate with a forest resource specialist to evaluate health of existing native wooded sites and provide recommendations for a management plan.

"Refuges Are Places Where Wildlife Comes First."
- U.S. Fish and Wildlife Service - Fulfilling the Promise, 1999

Wildlife

Goal: Preserve, restore, and enhance the diversity and abundance of migratory birds and other native wildlife with emphasis on waterfowl, grassland and wetland-dependent birds.

Waterfowl (Ducks, Geese, and Swans)

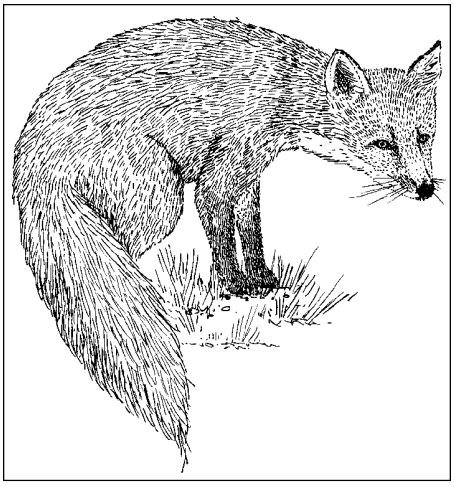
North America's greatest duck producing area is known as the Prairie Pothole Region (Figure 4). This area includes south central Canada, eastern North and South Dakota, western Minnesota, and north central Iowa. The Refuge provides nesting habitat for 13 species of waterfowl, and migrating food and resting habitat for 21 species of waterfowl. Blue-winged teal, mallards, gadwall, northern pintails, and northern shovelers are common nesters in grassland habitats while redheads, canvasbacks, and ruddy ducks nest overwater in Refuge wetlands. Wood ducks nest in Refuge trees. Large flocks of Canada geese, snow geese, and ducks use Refuge crop fields to feed during spring and fall migration. Prior to 1900, the giant Canada goose was distributed throughout North Dakota. Hunting pressure, egg collecting, and habitat destruction decimated this population during the 1900's. Restoration of giant Canada goose populations began in the1930's with considerable effort made in the 1960's-1970's (Lee et al. 1984). The Refuge was a release site for some of the restoration efforts. Since then, the return of the giant Canada goose to North Dakota has been a huge success story. Resident Canada geese populations have grown from their reintroduction populations in the 1970's to levels that yield 10-15 area crop depredation complaints per year.

"The original northern prairies were strewn with small lakes, potholes, and marshes and veined with tiny creeks ... Through spring, summer, and fall these regions were darkened with clouds of waterfowl of all kinds."
- John Madson, 1982, *Where the Sky Began*

Waterfowl Nesting

The Refuge is surrounded by intense agricultural use, that severely alters the surrounding natural landscape. The Refuge provides the majority of quality waterfowl upland nesting habitat in the area. The Conservation Reserve Program (CRP) has greatly increased grassland cover throughout the Complex in the past 10 years. However, the continued presence of this cover on the landscape depends on funding for this U.S. Department of Agriculture program. In areas with intense agriculture, nesting ducks and their eggs are one of the most abundant, vulnerable, and desirable prey types available to red foxes (Sargent et al. 1984). Large tracts of thick residual cover require more effort for foxes to search. As grasslands are fragmented and tracts become smaller, nesting ducks become more vulnerable. Predation has been identified as a principal cause of nest loss (Sargent and Raveling 1992). At the Refuge, the major predators on ducks and duck eggs include: red fox, striped skunk, raccoon, mink, and Franklin's ground squirrel. Avian predators including northern harriers, red-tailed hawks, and great horned owls prey on duck and young. Gulls can also destroy nests on islands. The red fox is the main ground nesting duck predator in southeastern North Dakota. Red fox will not only eat and destroy eggs but will kill the hens if possible. Red fox kill an estimated 242,000 dabbling ducks annually in North Dakota during the three month (approximate) fox denning season (Sargent et al. 1984). Removal of predators (primarily red fox) can cause nest success to increase from 8 percent (Sargeant et al. 1995) to an average 30 percent (Refuge nest success records1990 - 1998). A nesting success of approximately 15 to 20 percent is suggested to maintain stable duck populations of the five most common species of dabbling ducks (Cowardin et al. 1985, Greenwood 1986, Klett et al. 1988). In severely altered landscapes, like the Refuge, intensive management such as predator control is the only efficient way to increase nest success (Clark and Nudds 1991, Nudds and Clark 1992). The most effective time to conduct predator control is in the spring when red fox are caring for their young and little movement of foxes occurs in and out of an area (Sargeant et al. 1993).

Other activities that increase nesting success have been researched, discussed, and examined to determine the most economical, feasible, and effective method. One possibility includes purchasing enough additional tracts of land adjacent to the Refuge to create a large enough block of contiguous grassland habitat to increase nest success. This approach would be similar to USDA's Conservation Reserve Program (CRP). To provide for grassland cover on 100 acres of cropland for a 10-year period would cost $40,000 to $50,000 assuming a $40 to $50 per acre, per year payment. This would not be economically possible at this time. Predator proof fences are another way to increase nesting success. Three predator fences (100 total acres) have been built on the Refuge. Predator fences cost approximately $100,000 per fence for materials and contracted labor to build. They are labor intensive and involve many staff hours to maintain. Nesting success is high in predator fences. According to Refuge nest dragging information (1987-1999), an average nest success for the fences is 85 percent. Predator control on the entire Refuge for two to three weeks in the spring of the year averages about $2,500. This focused predator control effort effectively and efficiently meets our nesting success objective.



Fox, Cindie Brunner

To develop the next objective, the planning team looked at following information: 1) the importance of the Refuge to nesting waterfowl; 2) the extensive research that has been done to evaluate predator impacts on nesting populations; 3) and the nest monitoring studies that have been conducted on the Refuge. A nesting success of 30 percent (Mayfield) was chosen because it maintains stable Refuge duck populations and contributes to the overall duck population.

Objective: Maintain an average upland duck nesting success of at least 30 percent (Mayfield) to increase waterfowl production on the Refuge.

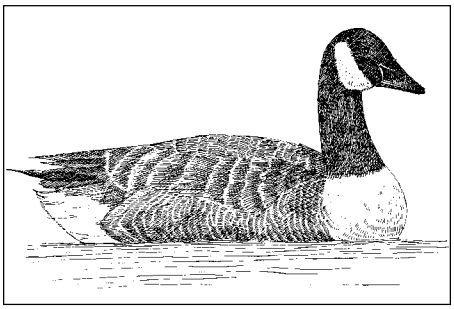
Strategies:

- ✓ Continue to annually monitor upland duck nesting success utilizing standard nest search methods on selected Refuge uplands.
- ✓ When the average nesting success falls below 30 percent (Mayfield) and wetland conditions are favorable, initiate predator (red fox, raccoon, skunk, mink, and feral cat) control in the spring prior to the waterfowl nesting season, for approximately two to three weeks.

Planted Foods

Historically, the majority of Refuge uplands were farmed. Since these lands have been acquired, most of the cropland has been seeded to grassland cover (See Map 8 and 9). Currently, the Refuge has approximately 500 acres of cropland. Corn, millet, and winter rye or winter wheat are left as a Refuge share for migrating waterfowl and resident wildlife in the winter. Refuge farm cooperators maintain Refuge food plots on a 25:75 crop share basis. The number of interested cooperators is dwindling due to the small field sizes and the decreased variety of approved herbicides. It is important to note that approximately 135 acres of cropland are considered necessary to support migrating waterfowl and resident wildlife. Crop sharing is currently the only method available to provide this resource. Cooperators could be compensated for planting only 135 acres of cropland if an annual funding source could be developed.

Farming on refuges is controversial. National and regional trends in refuge management have emphasized scaling back or terminating farming programs to reduce chemical use and restore natural vegetation. Biological reasons for maintaining the Tewaukon farming program identified in the 1996 Cropland Management Plan included providing food sources for migrating waterfowl, wintering deer (approximately 300), and other resident species. The relationship between the Refuge farming program and regionally popular game species, primarily deer and pheasants, was discussed by the planning team. The planning team recognized that establishing Refuge legislation language describes providing habitat for “other wildlife” in addition to migratory birds.



Canada Goose, Cindie Brunner

Refuge cropland food sources can also be linked to two waterfowl overpopulation concerns. Though the overall contribution of Tewaukon Refuge crop fields to the growth of mid-continent snow goose numbers is minimal, the availability of grain food sources has been linked to improved snow goose survival and the damage this population is doing on tundra nesting grounds. Local populations of Canada geese also have experienced rapid growth in the past 10 years due in part to their use of Refuge crop fields. The planning team recognized that many biological factors exist in addition to Refuge cropping that affect Canada Goose populations, such as record water levels in area wetlands and changes in crop rotations like the addition of soybeans. The crop damage that local Canada geese are causing in Richland and Sargent Counties has resulted in an increased number of complaints in the past five years. This resulted in the establishment of an experimental 1999 September hunting season to try and curb the growth of this population.

There are also less tangible benefits to providing small grain and row crops on a small portion of Refuge uplands such as the reduction, or perceived reduction of crop depredation on private lands. After discussing these issues, the planning team developed the following cropland objective.

Objective: Maintain no more than 135 acres of cropland as a Refuge share to provide green browse and millet/corn for migratory waterfowl.

Strategies:

- ✓ Work annually with farm cooperators to plant and maintain Refuge food plots on a 25:75 crop share basis. Work to find alternative methods to the existing crop share farming program.

Migratory Birds

The Refuge was established as a refuge and breeding ground for migratory birds (See Appendix A for a list of bird species observed on the Refuge). Migratory birds and habitat management for migratory birds will continue to be emphasized at the Refuge. Waterfowl have historically received management priority due to the Refuge's location in the Prairie Pothole Region. The concern over the decline of other migratory birds in the country has increased the availability of information on other nesting bird species, Refuge management priorities will expand to include other migratory bird species at risk.

> "Then, one day in late February or early March, the migrants began returning to the old prairie. They brought spring with them, and a surge of life and excitement... serried flocks of ducks and geese beyond number, and endless wedges of curlews and plovers...giant cranes, and a multitude of small minstrels – warblers, larks, singing sparrows, longspurs, redwings, and a host of others... The prairie pulse quickened; it was spring again, with the birds come home."
> - John Madson, 1982, *Where the Sky Began*

Shorebirds

Thirty-seven species of shorebirds and 28 species of sandpipers commonly cross the interior plains during spring and fall migrations (Skagen 1997). The habitat used by migratory shorebirds consists of small, shallow wetlands or wet muddy areas. Shorebirds inhabit the prairie region from mid-March through mid-October depending on weather and water conditions. Shorebird populations migrating through the Great Plains tend to be scattered and they stop periodically to replenish fat reserves (Skagen 1997). Shorebirds are flexible in their migration stops because prairie wetland levels and conditions are highly variable. Eighteen species of shorebirds breed in North Dakota (Stewart 1975). A variety of shorebirds use the Refuge when wetland conditions meet their needs.

Wading Birds

Like shorebirds, the number of wading birds (herons, egrets, rails, bitterns) breeding on the Refuge fluctuates with the availability of water. A heron colony has existed on the Refuge since 1993 when water returned to the southeastern North Dakota. Great blue herons, great egrets, double-crested cormorants, and black-crowned night herons nest in the colony located in dead trees in Pool 7A. No record exists of a heron colony on the Refuge prior to 1993.

Raptors

Raptors (including eagles, hawks, falcons, and owls) can be seen on the Refuge. The three most common hawks nesting on the Refuge are the red-tailed hawk, northern harrier, and the Swainson's hawk. Great horned owls are the most common owl nesting on the Refuge. Several species of raptors migrate through the Refuge in the spring and fall. Most notable are bald eagles which follow the waterfowl migrations and can be regularly seen around Lake Tewaukon and Sprague Lake.

Grassland Migratory Birds

Herkert (1995) looked at the data from the North American Breeding Bird Survey between 1996 and 1993 and found that grassland migratory bird species are declining faster than any other group of breeding species in the Midwestern United States. Bobolinks and western meadowlarks showed the greatest decline (Herkert 1995). Habitat fragmentation is one of the causes of population decline in grassland birds (Samson 1980, Herkert 1994, Vickery et al. 1994). Habitat size is important for some grassland birds (Samson 1980, Herkert 1994, Vickery et al. 1994) and the amount of edge (the area where two different habitats overlap or are adjacent to each other) of that patch of habitat is also important (Helzer and Jelinski 1999). Some grassland species avoid nesting near different habitat edges such as a grassland patch overlapping or adjacent to a woodland patch (Johnson and Temple 1986, Delisle 1995, Helzer 1996). Higher predation on nests and birds and parasitism of nests increased for grassland birds the closer they were to wooded edges (Johnson and Temple 1986 and 1990, Burger et al. 1994). See Refuge Habitat Grassland Section for more discussion on grassland migratory bird habitat.

Meadowlark, Cindie Brunner

Woodland Migratory Birds

Some woodland migratory bird species have increased their number in North Dakota from 1967 to 1993 such as the western kingbird, brown thrasher, and song sparrows along with species like American robins, house sparrows, cliff swallows, and barn swallows that are associated with people and structures (Johnson et al. 1997).

The following objectives were developed to help Refuge Managers and Biologists gather additional information about the populations of birds that breed on the Refuge in order to determine how to best provide habitat for their life needs. (See Refuge Grasslands Native Prairie section for further information.)

Objective: Monitor relative abundance and breeding status for four tallgrass prairie indicator bird species in the six areas identified for grassland bird management to provide feedback and information on the tallgrass prairie habitat management approach.

Strategies:

- ✓ Develop a step-down Monitoring Plan to address changes over time in relative abundance on a local scale and breeding documentation of the four indicator species (northern harrier, upland sandpiper, bobolink, and grasshopper sparrow) on the six Prairie Focus Areas.

Objective: Initiate a baseline breeding bird survey on the Refuge to monitor local breeding migratory bird population changes over time.

Strategies:

- ✓ Participate in local area Breeding Bird Survey (BBS) route.

Migratory Bird Disease Outbreaks

The first documented migratory bird disease outbreak on the Refuge occurred in April 1991. This was a small outbreak, 79 total birds were collected (76 snow geese, 1 white front goose, and 2 lesser scaup) on Lake Tewaukon. The cause of the disease was avian cholera. Another small disease outbreak occurred in August of 1999 in Pool 7A and Pool 3. Ten ducks, one Canada goose, one cormorant, and one least sandpiper were collected from the two sites. Except for the Canada goose, botulism was determined to be the cause of death in all of the birds. Water levels in Pool 7A had been dropped quickly to allow for the replacement of a structure. Rapid water fluctuations and warm weather are favorable conditions for botulism.

Procedures for attempting to contain migratory bird disease outbreaks are similar for most of the diseases encountered on the Refuge. These procedures include monitoring wetlands for dead or dying birds, immediate collection of dead birds, submitting specimens to the National Wildlife Health Center, and safe and proper disposal of the remaining carcasses. Promptly removing dead and dying birds from the disease outbreak area decreases the exposure that other birds and other animals have to the carcasses.

Objective: Respond to and contain migratory bird disease outbreaks by applying safe and proper procedures as recommended by National Wildlife Health Center protocol.

Strategies:

- ✓ Manage water level conditions on the Refuge to minimize conditions known to precipitate diseases outbreaks.
- ✓ Submit carcasses to the National Wildlife Health Center for evaluation and determination of cause of death.
- ✓ Properly follow disease mitigation procedures to limit impacts to migratory bird populations.

Native Resident Wildlife

Mammals

The tallgrass prairie ecosystem was a vast and diverse habitat for a variety of wildlife. Bison, grizzly bear, wolves, elk, antelope, mule deer, bobcat, moose, and river otter (Bailey 1926) once lived in the tallgrass prairie wetland ecosystem. Today, these species are either not found here at all or are present in very low numbers. White-tailed deer are the only common Refuge large animal left from the group of large mammals historically found on tallgrass prairie. White-tailed deer numbers have increased in response to changes associated with agricultural and settlement. Today approximately 200-300 white-tailed deer winter on the Refuge, taking advantage of the shelterbelts and cropland. Only one objective was developed by the planning team to address specifically managing the Refuge white-tailed deer population. Many of the other habitat objectives will support deer populations.

Objective: Maintain an average winter deer population of no more than 250 to minimize vegetative and crop damages on Refuge and adjacent lands.

Strategies:

✓ Work cooperatively with the ND Game and Fish Department to adjust Refuge deer hunting permits, monitor wintering deer numbers, and determine carrying capacity.

Various other small and medium sized mammals can be found on the Refuge including: jumping mice, raccoons, eastern cottontails, white-tailed jackrabbits, long-tailed weasels, woodchucks, beaver, muskrats, mink, badgers, coyotes, and red foxes. Habitat management described in the CCP is expected to sustain these populations.

Objective: Develop a specific Monitoring Plan to gather baseline information for small and medium mammal populations on the Refuge.

Resident native birds are few due to very cold and snowy winters that limit food and shelter. Though classified as migratory birds, great horned owls, woodpeckers, white-breasted nuthatches, chickadees, and horned larks are a few of the birds that are present on the Refuge year-round. Many of the habitat objectives will affect these populations. Habitat management described in the CCP is expected to sustain these populations.

Upland Game Birds

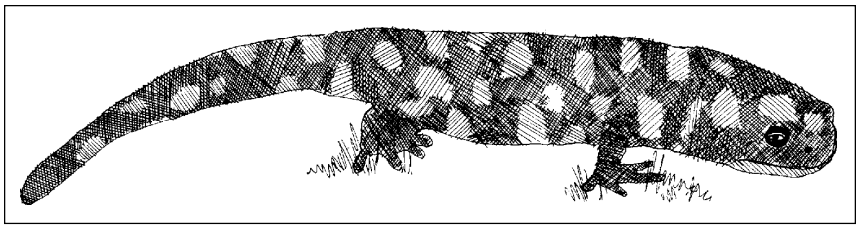
Only one species of native upland game bird, the sharp-tailed grouse, can be found on the Refuge. Sharp-tailed grouse are few in number and only spotted occasionally on the Refuge. There has been a lot of debate about the presence of greater prairie chickens which were not thought to occur in North Dakota prior to the late 1870's (Stewart 1975). By 1884, prairie chickens were as common as sharp-tailed grouse and spread rapidly throughout the State (Stewart 1975). Downward population trends started in the early 1940's; by 1972, fewer than 400 birds existed in North Dakota (Johnson et al. 1997). The planning team did not develop management objectives for prairie chickens since they have not been documented on the Refuge nor for sharp-tailed grouse since their occurrence on the Refuge is limited to occasional sightings.

Reptiles and Amphibians

Throughout the world there has been an apparent decline of amphibian species (Yoffe 1992; Blaustein 1994; Corn 1994). The prairie has had a longer decline than most other places (Corn and Peterson 1996). Northern leopard frogs almost disappeared from tallgrass prairies in Wisconsin and Minnesota in the 1960's and 1970's (Gibbs et al. 1971; Hine et al. 1981). The cause of decline is not well known although commercial harvest (Gibbs et al. 1971), and contamination from agricultural chemicals (Hine et al.1981) are two of the more likely causes. Of the 124 species of reptiles and amphibians that occur in prairie habitats in central North America, 42 species are associated with grassland habitats, 38 are primarily aquatic or require permanent water (i.e. leopard frogs); 28 use forests or woody vegetation (grey treefrog), and 16 species are use a variety of habitats (tiger salamander) (Corn and Peterson 1996). Protection of prairie reptiles and amphibians has not received much attention from a management or conservation perspective. Because of the sharp decline of wetland and prairie habitat in the tallgrass prairie, the abundance of aquatic species is just a fraction of their former abundance (Corn and Peterson 1996).

Little population information exists for many refuge species such as reptiles, amphibians, small mammals, or invertebrates that fit the description of "other wildlife," as described in establishing Refuge legislation language. In order to provide better background for refuge managers to evaluate options, basic population data need to be collected as described in the following objectives.

Objective: Develop a specific Monitoring Plan to gather baseline information for amphibian and reptile populations on the Refuge.



Tiger Salamander, Cindie Brunner

Nonnative Wildlife

In the Fish and Wildlife Service manual under the Populations Management section (7 Refuge Manual 8.1), the issue of nonnative species introduction and management is addressed by policy. The policy states that the National Wildlife Refuge System exists for the protection and management of plants and animals native to the United States. This policy directs refuge managers "to prevent further introductions of exotic (nonnative) species on national wildlife refuges (including all lands and WPAs) except where an exotic (nonnative) species would have value as a biological control agent (an example would be leafy spurge beetles and tiger muskies) and would be compatible with the objectives of the refuge."

Healthy populations of several species of wildlife both nonnative to North America and to North Dakota can be found on the Refuge. These nonnative species compete with native wildlife for food, water, cover, and space. Some species, like cats and dogs, will kill other native wildlife for food and sport. Other species, like house sparrows and starlings, out-compete native species for resources like nesting cavities that could be used by bluebirds, tree swallows, and house wrens. Carp do a great deal of habitat damage by destroying wetland vegetation that is utilized by water birds and other fish species. Carp also occupy a large amount of habitat that could be occupied by native fish species. Other nonnative species, like the ring-necked pheasant, are not known to directly compete with nesting Refuge species. The following objective was developed to address the range of options Refuge managers will use to manage these species.

Objective: Restrict the spread of existing and additional nonnative animal species (carp, house sparrows, and feral dogs and cats).

Strategies:

- ✓ Reduce population densities of carp to maintain a total biomass of less than 30.0 kg/survey as recommended in the 1996 Fisheries Management Plan in Refuge waters by applying appropriate management tools including the addition of predator fish (i.e., tiger muskies), minimum size limits on predator fish (northern pike and walleyes), water management, chemical control, and commercial harvest.
- ✓ Apply, when appropriate, management tools (including lethal, nonlethal methods and habitat manipulation) that eliminate or limit the expansion of introduced animal species such as feral dogs and cats, house sparrows, and carp.
- ✓ Gather existing information and promote additional research on management techniques and affects of nonnative species on native flora and fauna.

Objective: Refrain from carrying out additional management activities that specifically encourage population expansion of existing introductions (pheasants, gray partridge) to the detriment of native species.

For example, the best habitat management to improve Refuge pheasant populations, outside of requesting much milder winters and a dry springtime, would be to establish more large blocks of shrubs and trees for winter cover and incorporate more, or change the distribution of winter food plots. Both of these techniques would be harmful to grassland nesting migratory birds that avoid shrub and tree edges and have poorer reproductive success in smaller blocks of grassland cover (Helzer and Jelinski 1999). When considering management options, this objective guides managers to favor native grassland nesting migratory birds. A number of objectives occur in this Plan, such as maintaining cropland (i.e., millet bales), increasing the density of grassland cover, and using predator control, that will still provide pheasant habitat and improve their nest success.

Wildlife Disturbance

The demand for wildlife associated recreation has increased dramatically over the last 20 years. Outdoor recreation can affect wildlife behavior (i.e., feeding, resting) and survival to varying degrees.

Wildlife seek refuge from all forms of disturbance, particularly those associated with loud noise and rapid movement. After reviewing several thousand journal articles and books, Dahlgren and Korschgen (1992) reported that studies indicate that water users were the primary cause of most disturbances to waterfowl. Listed in order of decreasing disturbance are: rapid overwater movement and loud noise (powerboating, waterskiing); overwater movement with little noise (sailing, wind surfing, rowing, canoeing); little overwater movement or noise (wading, swimming); and activities along shorelines (fishing, bird-watching, hiking and traffic). These disturbances can decrease the amount of time a bird spends feeding by seven times and increases the amount of time a bird incurs high energy costs associated with flight (Edington and Edington 1986).

Wildlife expend considerable energy and effort in order to successfully reproduce and raise young. Disturbance at this time of year by humans can scatter broods and separate adults from young thus increasing their risk of predation, exposure, and starvation due to inexperience in finding food (Sherwood 1965). In studies in England and Germany, an 80 percent decrease of waterfowl nests and an 85 percent decrease in duck pairs were related to the increasing number of anglers during the breeding season (Reichholf 1976, Åhlund and Götmark 1989). Disturbance from observers caused a 10 percent nest abandonment rate by mallards using artificial nest baskets in an Iowa study (Dahlgren and Korschgen 1992).

Winter survival of resident wildlife, i.e., white-tailed deer, can be caused by a variety of disturbances ranging from snowmobiles to cross-country skiers. Human caused wildlife disturbance during the winter can increase additional stress and can lead to the death of wildlife.

Migrating Wildlife Habitat

Bird migration periods vary from year-to-year depending on regional resource availability, climatic events along the migration corridors, and the bird species. For example, Refuge peak waterfowl migration in the spring occurs from March through April while peak bobolink migration usually occurs from May through early June. The number of birds that use the Refuge as a resting and feeding area varies widely from year-to-year depending on available water and food in the surrounding region. For example, in March of 1993 the only available open water in our region was Lake Tewaukon and at that time, an estimated 700,000 snow geese used the lake. Compared to the fall of 1999, when open water was available all over the region, only an estimated 5,000 snow geese used the Refuge.

Current Refuge road closures effectively limit angling disturbance of waterbirds to 5 percent of Lake Tewaukon and less than 10 percent of the Sprague Lake shorelines. The majority of Refuge anglers fish the shoreline areas adjacent to roads and trails open to vehicles. Road closures will also limit the amount of waterbird disturbance from wildlife observers and photographers. To limit disturbance to migratory waterbirds, the road around Lake Tewaukon and the trail around the south side of Sprague Lake will be closed to vehicles from October through April. The Point (peninsula that juts out into Lake Tewaukon) will be closed to all public entry from October through April.

In September, the Refuge is open to walk-in archery hunters and youth deer hunters. These activities generate less than 40 visitors a year to the Refuge and provide minimal disturbance to migrating birds. The Refuge is closed to all hunting during the peak fall migration period in October.

Objective: Manage the Refuge as a protected resting and feeding area for migratory birds during the spring and fall migration periods.

Strategies:

- ✓ Manage Lake Tewaukon and Sprague Lake as open water rest areas for migratory water birds.
- ✓ Close Lake Tewaukon and Sprague Lake to boat traffic from October 1 through April 30 during the peak migration period.
- ✓ Close the road around Lake Tewaukon and the trail south of Sprague Lake to vehicles from October 1 through April 30. Close the Point to all public entry from October 1 through April 30 to reduce disturbance to migratory water birds.
- ✓ During the primary waterbird fall migration period (October), close all hunting activities for white-tailed deer and ring-necked pheasant hunting season on the Refuge.
- ✓ Gather existing information on public disturbance and its effects on wildlife and promote further research on this issue on the Refuge.

Nesting Birds and Other Breeding Wildlife

The nesting and rearing season for birds and other wildlife on the Refuge lasts from April through August. Wildlife utilize grassland, wetland, and tree and shrub habitats to reproduce and raise young. Providing areas of minimal human disturbance during this season was recognized by the planning team as important for wildlife survivability.

Currently, visitor use is primarily associated with the main Refuge road around Lake Tewaukon and the area east of County Road 12. It is recognized that a disturbance occurs to wildlife and habitat during activities such as hiking, photography, and wildlife observation. These disturbances include trampling of vegetation, flushing of nesting birds, scattering young, and occasional death from vehicles. Approximately 15 percent of the Refuge is open to wildlife-dependent recreation during the nesting and reproductive season. Currently, Refuge use in this area is limited to driving the Lake road and fishing along the shoreline. Few visitors venture off established roads and trails into the grassland and wetland habitats. If an increase in this type of use occurs, a reevaluation of the use and possible rezoning of open areas or the development of established walking/observation trails can mitigate impacts that may occur.

Objective: Manage the Sprague Lake Unit (except for the Lake) and the area west of County Road 12 on the Tewaukon Unit as a closed area to the public from April through August to reduce disturbance to wildlife nesting and reproduction.

Strategies:

- ✓ Identify limited access areas to the public through signs, news releases, and pamphlets and provide information to the public about the impacts of human disturbance to wildlife.
- ✓ Evaluate exceptions for public access on these areas based on activities requested and their potential impacts to nesting and reproducing wildlife.

Wintering Wildlife Habitat

On the Refuge, winter encompasses the months of December through February. Stress periods for wildlife are predominately associated with cold temperatures and snow which vary from year-to-year. In the winter of 1997, extreme weather including eight blizzards, over 100 inches of snow, and a severe ice storm in April caused mortality in deer, pheasants, and other wildlife. Providing areas of minimal human disturbance during this season was recognized by the planning team as important for wildlife survivability.

Winter recreation on the Refuge is limited to ice fishing and access for ice fishing on Tewaukon and Sprague Lakes. Other user groups which have inquired about winter public use activities include cross-country skiers, ice skaters, dog sled users, and snowshoe users. These activities have not been allowed in the past due to the potential disturbance to wildlife and safety issues.

Objective: Manage the Refuge (except for ice fishing on Tewaukon and Sprague Lake) as a closed area from January through April to reduce disturbance to wintering resident wildlife.

Strategies:

- ✓ Maintain the road as closed around Lake Tewaukon and the trail south of Sprague Lake to vehicles from January through April 30. Maintain the Point as closed to all public entry from January through April 30 to reduce disturbance to wintering resident wildlife.
- ✓ Limit vehicle use (including snowmobiles) to access for winter ice fishing to specific areas on Lake Tewaukon, the north boat ramp, east boat ramp, and access from County Road 12. Limit vehicle use to access for winter ice fishing on Sprague Lake to the boat ramps (west and east).
- ✓ Winter hiking, snowshoeing, ice skating, cross-country skiing, and other recreational activities not associated with recreational fishing access on Tewaukon and Sprague Lakes will not be permitted.
- ✓ Identify limited access areas to the public through signs, news releases, and pamphlets and provide information to the public about the impacts of human disturbance to wildlife.

Endangered Species

Goal: Contribute to the preservation and restoration of endangered, threatened, rare, and unique flora and fauna that occur, or have historically occurred in the area of Tewaukon National Wildlife Refuge.

With the delisting of the peregrine falcon from the Federal Endangered Species List, only the federally threatened bald eagle is known to occur or have been observed on the Refuge. Bald eagles are regularly sighted during the spring and fall migration periods.

Only two federally listed endangered species likely used the Refuge historically, the whooping crane and the gray wolf. These species have never been recorded on the Refuge since files have been kept. Records of whooping crane nests and young birds indicate that breeding birds formerly occurred in southeast North Dakota, but mostly in the more central region (Stewart 1975). Whooping cranes more likely only migrated through the Refuge. Historically, gray wolves were found throughout North Dakota and were known as plains wolves or buffalo wolf (U.S. Fish and Wildlife 1995). Gray wolves were extirpated from North Dakota through shooting, trapping, and poisoning but occasional sightings have been reported in this District since 1985.

Service Species of Concern

Species that appeared on the Fish and Wildlife Service Species of Concern List (1995) and occur or may have occurred historically on the Tewaukon Refuge include:

Birds Black tern, Ferruginous Hawk, Loggerhead shrike
Insects Regal fritillary butterfly

Black terns are associated with semipermanent and permanent wetlands with emergent stands of vegetation. Black tern young and nests have been observed on the Refuge (Tewaukon staff notes). Ferruginous hawks have occasionally been observed during migration. Loggerhead shrikes have been seen occasionally on the Refuge, but no nests or territorial males have been recorded (Tewaukon staff notes).

With the exception of the black tern, the other bird species of management concern are seen only occasionally on the Refuge during migration. Since little information exists about Refuge breeding populations of black terns, the status of this species will best be addressed under the baseline breeding bird survey objective in the Refuge Migratory Bird Section.

Rare Butterflies

In 1996, Tim Orwig surveyed the Refuge native prairie sites for rare butterflies. Regal fritillary butterflies, and powesheik skippers were recorded on two Refuge sites. Both the regal fritillary and the powesheik skipper are found exclusively on native prairie sites. The larvae of these butterflies feed on native grasses and a variety of native forbs when they are adults. A list of the other butterflies observed are in Tim Orwig's 1996 report.

Since the health of prairie communities and the species diversity of the prairies has been previously identified in the Plan as a management objective, the following objective was developed as a method for evaluating native prairie diversity. Three rare butterflies, regal fritillary, powesheik skipper, and Dakota skipper were chosen as indicator species in the "A Habitat-Based Approach to Management of Tallgrass Prairies" (Schroeder and Askerooth 2000).

Objective: Develop a Monitoring Plan to measure relative abundance of three rare butterflies in the six Prairie Focus Areas to provide feedback and information to the tallgrass prairie habitat management approach.

Public Use and Recreation

> "Natural resource management is 90 percent managing the public and 10 percent managing the resource"
> - Unknown

More than 30 million people visit national wildlife refuges every year. The vision for the future in the Fulfilling the Promises (1999) states that:

"The National Wildlife Refuge System of the next century will provide the American people a legacy of wildlife, a place where visitors are welcome, opportunities for stewardship and a system to appreciate."

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

Given the long legislative history that encourages compatible wildlife-dependent public uses on refuges and the long history of wildlife related public use on Tewaukon Refuge, several objectives were developed by the planning team to continue providing the six priority recreational uses: fishing, hunting, wildlife observation and photography, interpretation and environmental education.

Goal: Provide recreational and educational opportunities for persons of all abilities to learn about and enjoy tallgrass prairie wetland ecosystem, the fish and wildlife found there, and the history of the Refuge in a safe and compatible manner.

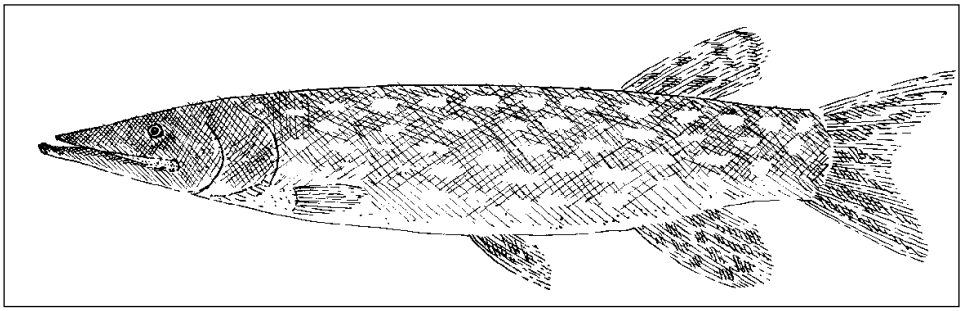
Fishing

Historical references documenting native fish in eastern North Dakota list yellow perch, Northern pike, and bullheads (Cvancara 1983). Fish populations have been highly variable in Lake Tewaukon. In the 1940's, strong populations of northern pike, walleye, crappies, and perch were present. After carp became established in 1943, fishing steadily declined until 1955. Rough fish removal, heavy stocking, and minimum size limits for Northern pike and walleye, and low water conditions in Refuge pools have helped to improve desirable fish populations and limit carp numbers. Currently, fish species present on the Refuge include carp, walleye, Northern pike, yellow perch, black bullhead, yellow bullhead, black crappie, white sucker, fathead minnow, golden shiner, and tiger muskie. No endangered or threatened fish species have been sampled on Refuge.

Lake Tewaukon has been an important public recreational spot since the 1880's. Historic uses on Lake Tewaukon included extensive boating, swimming, and fishing. When Refuge and flowage easements were secured in the 1930's, it was with the support of local landowners and the sportsmen's clubs. Their support of additional land acquisition, came with the provision that recreational fishing would continue and be improved on the Refuge (1954 resolution by area wildlife clubs and 1955 response letter from the Service in Refuge files). The 1962 Tewaukon Master Plan addresses this understanding between the local community and the Service: "When land acquisition was initiated, it was with the understanding that recreational use of the lake would be continued and improved."

Past fisheries improvement projects have included:

- Managing Tewaukon and Sprague Lakes at higher elevations (1970).
- Placing artificial reefs of Christmas trees to enhance shelter for various species (1988, 1991) and artificial fish structures (1997).
- Carp removal projects (1985, 1989, 1990 and 1993) in Lake Tewaukon.
- Installing an aeration system in Lake Tewaukon (1986).



Northern Pike, Cindie Brunner

Tewaukon and Sprague Lakes are managed as open water migratory bird rest areas. Because they are large (Lake Tewaukon 1,000 acres and Sprague Lake 184 acres) and relatively deep (8 to 9 feet), they offer the best opportunity on the Refuge to provide recreational fishing. Though fish may intermittently occur in other Refuge pools, wetland management objectives developed to benefit migratory birds, do not provide favorable conditions for fish (See Refuge Managed Wetland Section). Recreational fisheries will only be managed on Tewaukon and Sprague Lakes and all other Refuge pools will remain closed to recreational fishing.

The original compatibility determination completed in 1994, limited fishing to Tewaukon and Sprague Lakes. The compatibility determination was reviewed as part of this planning process and determined to be adequate, appropriate and current (See Appendix G). Stipulations on fishing include closing the two lakes to boat fishing and portions of lakeshore roads during the spring and fall waterbird migration periods.

Currently, fishing facilities on the two Lakes include three boat ramps on Lake Tewaukon and two on Sprague Lake. An accessible fishing dock and ramp, outdoor rest rooms, picnic tables, picnic shelter and informational kiosks are available on Lake Tewaukon (See Map 10-13). A public use summary guide is available to anglers and describes Refuge specific regulations and opportunities.

A Refuge Fisheries Management Plan was completed for Tewaukon and Sprague Lakes for 1996 - 2005. This Plan discusses several ways to improve recreational fish population conditions in Tewaukon and Sprague Lakes. The following objective adopts those recommendations.

Objective: Maintain populations of sport fish including northern pike greater than 35 kg/survey total biomass, walleyes greater than 30 kg/survey total biomass, and perch greater than 10 kg/survey total biomass in Tewaukon and Sprague Lakes in accordance with the 1996-2005 Refuge Fisheries Management Plan.

Strategies:

- ✓ Reduce population densities of carp to maintain a total biomass of less than 30 kg/survey in Refuge waters. (See CCP Nonnative Objective and Strategies).
- ✓ Work cooperatively with the Missouri River Fish and Wildlife Assistance Office and the ND Game and Fish Department to determine and implement fish stocking rates, harvest regulations, water management, monitoring of fish populations, and law enforcement.
- ✓ Maintain water levels at an average depth of approximately nine feet in Lake Tewaukon and eight feet in Sprague Lake.
- ✓ Maintain use of an aerator during October through March in Lake Tewaukon to help prevent the winterkill of fish species.

Objective: Provide public fishing opportunities in Lake Tewaukon and Sprague Lake when compatible.

Strategies:

- ✓ Provide shore fishing opportunities on the two lakes year-round.
- ✓ Provide boat fishing opportunities on the two lakes from May 1 to September 30.
- ✓ Work cooperatively with the Missouri River Fish and Wildlife Assistance Office and the ND Game and Fish Department to stock the lake with fish for public fishing opportunity.
- ✓ Work cooperatively with the ND Game and Fish Department to conduct law enforcement patrols to ensure special regulation compliance and provide a quality experience for all visitors.
- ✓ Work cooperatively with local groups to maintain and improve fishing facilities including five boat ramps, an accessible fishing pier and four public use areas (see Refuge Map 10 - 13) with rest rooms, picnic tables, and information kiosks.
- ✓ Identify open fishing areas to the public through signs, news releases, and pamphlets and inform the public about Refuge regulations and opportunities.

Hunting

Tewaukon Refuge is open for ring-necked pheasant and white-tailed deer hunting. Waterfowl and other migratory bird hunting is contrary to Refuge purposes as a "inviolate sanctuary for migratory birds." A Refuge Hunting Regulations and Map pamphlet is available to hunters in the fall and describes Refuge specific regulations and opportunities.

The Refuge is open to youth gun hunters and bow hunters for white-tailed deer in September and the deer rifle permit season in November. Archery season for deer reopens in November after the deer gun season to reduce hunting group conflicts and provide for a more safe hunter experience. All North Dakota State regulations apply. Refuge deer tags for the deer gun season are issued by the ND Game and Fish Department.

The Refuge is open to pheasant hunting after the close of the deer gun season in November through the end of the general State Season. Nontoxic shot is required. All North Dakota State regulations apply.

Objective: Provide public opportunity for pheasant hunting in November and December after the fall waterfowl migration. Deer hunting opportunities will also be provided during the months of September, November, and December before and after the waterfowl migration.

Strategies:

- ✓ Continue to provide a Youth deer gun season in September, archery deer hunting in September and December, and a deer gun season in November. Continue to provide a pheasant hunting season after the deer gun season in November and December.
- ✓ Work cooperatively with the ND Game and Fish Department to conduct law enforcement patrols to ensure special regulation compliance and provide a quality experience for all visitors.
- ✓ Work cooperatively with the ND Game and Fish Department to distribute deer gun permits and manage hunting seasons.
- ✓ Maintain parking areas and provide maps and pamphlets to provide information about Refuge hunting regulations and access.
- ✓ Identify open hunting areas to the public through signs, news releases, and pamphlets and inform the public about Refuge regulations and opportunities.

Wildlife Observation and Photography

Wildlife observation and photographic opportunities are available year-round on the Refuge east of County Road 12 (Map 10 - 13). Access to closed areas of the Refuge are by request only.

Objective: Provide public opportunity for wildlife observation and photography year-round on the east side of County Road 12 from May through August and November through December.

Strategies:

- ✓ Maintain the eight mile Prairie Lake auto tour around Lake Tewaukon to ensure a safe and quality experience from May 1 through September 30.
- ✓ Develop an accessible wildlife observation platform and interpretive hiking trail on the Refuge.
- ✓ Identify open wildlife viewing and photography areas to the public through signs, news releases, and pamphlets and inform the public about Refuge regulations and opportunities.

Interpretation

Currently, the Refuge has a small Visitor Center in the administrative headquarters. Three exhibits have been developed and installed at this site. Seven kiosks with information panels are located at the Visitor Center and the four public use areas and on the Lake Tewaukon overlook. A Prairie Lake Auto Tour has been developed around Lake Tewaukon and a short accessible prairie walk is located adjacent to the headquarters. A variety of pamphlets are available about the Service, the Refuge System, the Tewaukon Refuge, and other natural resources at the Visitor Center and kiosks.

Objective: Promote public awareness and advocacy of Refuge resources and management activities that conserve the regions' natural, cultural, and historical resources in the visitor center and use signs, exhibits, pamphlets, and programs elsewhere on the Complex.

Strategies:

- ✓ Develop a new Refuge general brochure, wildlife list (including mammals, amphibians, and butterflies), and a Dakota Tallgrass Prairie Project brochure.
- ✓ Maintain and update current brochures when necessary (including Public Use Summary and Map, Hunting Regulations and Map, Bird List, Refuge Map, and Prairie Lake Auto Tour).
- ✓ Provide visitor information and access to the Refuge Visitor Center on weekends during the months of July, August, September, October, and November which coincides with increased visitation.
- ✓ Develop three interactive, accessible interpretive exhibits for the Visitor Center on tallgrass prairie, wetland values and functions, and a Refuge orientation map.
- ✓ Expand the Visitor Center for more informational exhibits, space for visitors, and special events.
- ✓ Develop an accessible tallgrass prairie trail in a managed prairie site adjacent to the Refuge Visitor Center to promote awareness about tallgrass prairie values and management efforts.

Environmental Education

Over the last 10 years, the Refuge staff has aspired to develop an environmental education and outreach program on a local and statewide scale. Refuge staff have worked to educate and inform the public about a variety of natural resources, Refuge management activities and programs, and local, regional and national fish, wildlife, and habitat issues.

Objective: Environmental education programs and activities will focus on the native prairie/wetland ecosystem and Refuge natural, cultural, and historic resources. These activities will be designed to develop awareness and promote advocacy for Refuge resources and management activities.

Strategies:

- ✓ Present a program at each of the 15 local schools once a year to educate young people about natural resources and issues and promote an understanding of the U.S. Fish and Wildlife Service mission and purpose of the Tewaukon Complex.
- ✓ Continue to host an annual Tewaukon Field Day with the ND Extension Service, Cogswell Gun Club, and Tewaukon Rod and Gun Club as partners.
- ✓ Coordinate and promote the North Dakota Jr. Duck Stamp Program with several State wildlife groups.
- ✓ Participate in three County conservation tours with County Soil Conservation Districts each year.
- ✓ Conduct or host at least five school and group tours per year.

Public Outreach

The staff at the Refuge has worked to improve the public outreach program including news releases, programs, tours, presentations to local and interested groups, attending meetings, participating in local, County, and State activities and briefing Congressionals.

Objective: Develop awareness and foster an understanding of Complex resource issues and management activities through public outreach that develops Service and Refuge advocacy.

Strategies:

- ✓ Visit local wildlife and community groups two times per year to provide information on Refuge activities, management, and issues.
- ✓ Visit with congressional offices annually to keep them up-to-date on Refuge activities, management, and issues.
- ✓ Develop and maintain a Tewaukon Complex Website.
- ✓ Participate in one County fair each year.
- ✓ Host a Refuge Open House every year.
- ✓ Write 12 news releases for local and State newspapers annually. Conduct television and radio spots upon request.

Cultural Resources

The majority of the cultural resource information for the Refuge were complied in Jackson and 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." Additional information can be found in the report: "Archaeological Test Excavations at Lake Tewaukon (325A211): A Protohistoric Occupation Site in Southeastern North Dakota" by Thomas W. Haberman, 1978, University of North Dakota Historic (A.D. 1780 - present). Sites on the Refuge include the Langie family cemetery on the western shore of Lake Tewaukon and the campsite of General Sibley's military troops at Camp Parker on July 2 and 3, 1863, on the eastern shore of Parker's Bay.

Less than 5 percent of the Refuge has been surveyed for cultural resources. The majority of the cultural sites have been documented in gently sloping to moderately-well to well-drained soils, especially along Lakes. These areas offered the best sites for human occupation. Other areas are on the Refuge with similar soil and site characteristics that have not been surveyed and could be targeted.

Recommendations for the cultural resources at the Refuge were compiled from the two cultural resource reports mentioned previously. These recommendations include a comprehensive evaluation of the Refuge for cultural resources, protection of three existing sites from Lake shore erosion (and needed periodic test excavation monitoring), and nomination of several sites for the Natural Register of Historic Places.

Objectives were developed to protect, inventory, and inform the public about Refuge cultural resources.

Objective: Preserve and protect existing cultural resources and future discoveries of archaeological sites when they are discovered on Refuge lands.

Strategies:

- ✓ Continue to coordinate cultural resource inventories on construction and development sites. Work cooperatively with U.S. Fish and Wildlife Service archaeologist and State Historical Preservation Office prior to all proposed actions.
- ✓ Conduct a Class II cultural resource survey (sample inventory of project site for distribution and density over a larger area) on 1/3 of the Refuge areas that were not previously surveyed.
- ✓ Coordinate and develop an agreement with the Sisseton-Wahpeton Sioux tribe for any discovery of human remains.
- ✓ Provide a protective cabinet to preserve archaeological resources recovered in the University of North Dakota survey on the Refuge.

Objective: Increase public awareness of the significance of the cultural and archaeological resources located on Tewaukon Refuge Complex.

Strategies:

- ✓ Maintain Tewaukon's artifact display and interpretive panels.
- ✓ Develop additional interpretive materials for new information and sites.

Partners

The National Wildlife Refuge System recognizes that strong citizen support benefits the System. These benefits include the involvement and insight of citizen groups in Refuge resource and management issues and decisions, which helps managers gain an understanding of public concerns. Partners yield support for Refuge activities and programs, raise funds for projects, are activists on behalf of wildlife and the Refuge System and provide support on important wildlife and natural resource issues. In Fulfilling the Promises, the Service identified the need to forge new and nontraditional alliances and strengthen existing partnerships with States, Tribes, nonprofit organizations and academia to broaden citizen and community understanding of and support for the National Wildlife Refuge System.

A variety of people including but not limited to scientists, birders, anglers, hunters, ranchers, farmers, outdoor enthusiasts, and students have a great deal of interest in Tewaukon Complex's management, wildlife species, and habitats. This can be evidenced by the number of visitors to the Refuge and the partnerships that have been developed which are listed in Appendix I. The Complex staff will strive to maintain these partnerships. New partnerships will be formed with interested organizations, local civic groups, community schools, Federal and State governments, and other civic organizations if funding and staff are available.

Goal: Promote partnerships to preserve, restore, and enhance a diverse, healthy, and productive prairie/wetland ecosystem in which the Tewaukon Refuge serves as a model and demonstration area.

Objectives: Create opportunities for new and maintain existing partnerships among Federal, State, and local agencies, organizations, schools, corporations, and communities to promote the understanding and conservation of ecosystem and Refuge resources, activities, and management.

Strategies:

- ✓ Maintain coordination with the ND Game and Fish Department to conserve, protect, and manage lands for wildlife.
- ✓ Work with the Bureau of Reclamation and area landowners on the Kraft Slough National Wildlife Refuge acquisition project. Once the land is transferred to the U.S. Fish and Wildlife Service, develop a management plan for the area.
- ✓ Implement and support the goals and objectives of the Drift Prairie Wetland Enhancement Project through the North American Wetlands Conservation Act.
- ✓ Continue to support and coordinate the Refuge Fishing Tournament each year with the Tewaukon Rod and Gun Club and the Cogswell Gun Club.
- ✓ Continue to support and coordinate the Tewaukon Field Days each year with the ND Extension Service, Tewaukon Rod and Gun Club, the Cogswell Gun Club, and local 4-H groups.
- ✓ Identify and promote new partnerships to support restoration, protection, enhancement, and preservation of tallgrass prairie and its flora and fauna.

Volunteer Program

The 1998 Volunteer and Community Partnership Enhancement Act promotes understanding and conservation of fish, wildlife and plants, and cultural and historical resources of the Refuge. The purposes of the Act are to 1) encourage the use of volunteers to assist in the management of refuges; 2) to facilitate partnerships between the Refuge and nonfederal entities; 3) to promote public awareness of the resources of the Refuge and public participation in the conservation of the resources; and 4) to encourage donations and other contributions.

Objectives: Foster a volunteer program that supports Complex goals and objectives and provides a quality experience for volunteers.

Strategies:

- ✓ Utilize a variety of sources to recruit volunteers with diverse experiences.
- ✓ Provide room and board for volunteers while they are working at the Complex.

Tewaukon Wetland Management District

Purpose

The purpose for the Tewaukon Wetland Management District is determined by the legislation that authorized Waterfowl Production Area and wetland easement acquisition. Lands were acquired primarily to benefit migratory birds.

- For District lands acquired under the Public Law 85-585, dated August 1, 1958, the purpose of the acquisition is to assure the continued availability of habitat capable of supporting migratory bird populations at desired levels.
- For District lands acquired under the Migratory Bird Hunting and Conservation Stamp Tax, 16 U.S.C. § 718, as amended, for the purpose: "...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© (Migratory Bird Hunting and Conservation Stamp Tax).

Since March of 1996, North American Wetlands Conservation Act (NAWCA) funds have been used to acquire grassland easements in the three County Tewaukon District. Grassland easements are acquired only with companion wetland easements.

- The North American Wetlands Conservation Act, Public Law 101-233 - December 13, 1989, as amended in 1990, 1994, and 1998 is an Act to conserve North American wetland ecosystems and waterfowl and other migratory birds and fish and wildlife that depend upon such habitats.

Farmers Home Administration (FmHA) conservation easements have also been transferred to the Complex for administration.

- Conservation easements are executed by quitclaim deed through the State Executive Director of the Farm Service Agency, its successors or assigns, for the United States Department of Agriculture. The easements are under the authority and in furtherance of the provisions of Federal law, including sections 331 and 335 of the Consolidated Farm and Rural Development Act (7 U.S.C. 1981, 1985), Executive Order 11990 providing for the protection of wetlands, and Executive Order 1198 providing for the management of floodplains, and section 1314 of the Food Security Act of 1985 authorizing the Farmers Home Administration to grant easements for conservation purposes.

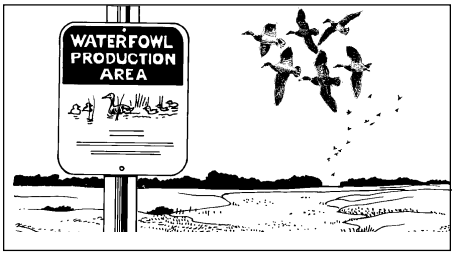
As part of the planning process, the Complex staff and planning team reviewed past national, regional, and Complex planning documents and current planning guidance. Using the legislation and plans, the planning team developed the following District vision statement.

Vision

The Tewaukon Wetland Management District will be preserved, restored, and enhanced as a part of the tallgrass prairie wetland ecosystem capable of supporting habitat for migratory birds and other native wildlife for the benefit of present and future generations. The District will provide a learning environment where a diversity of tallgrass prairie, wetlands, plants, wildlife, and natural processes can be found. Provide opportunities where people can enjoy wildlife associated recreation.

Description of the District

The Tewaukon Wetland Management District is comprised of over 14,000 acres of fee Waterfowl Production Areas (WPA) (Map 2), 35,000 acres of wetland easements, 10,400 acres of grassland easements, and 112 wetland and 45 grassland acres in FmHA easements in Ransom, Sargent, and Richland Counties.



Waterfowl Production Areas

The majority of Waterfowl Production Areas in the Tewaukon Wetland Management District were purchased in the 1960's. WPAs are owned in fee title by the Service. Historically, acquisition of WPAs focused on larger semipermanent wetlands, and 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 the Refuge or another WPA as higher priorities for acquisition. Currently, the Service purchases on average one WPA in this District every three years.

Wetland Easements

The Small Wetlands Acquisition Program was authorized by Congress in 1958 by an amendment to the Migratory Bird Hunting and Conservation Stamp Act. The purpose of the program is to ensure long-term protection of waterfowl breeding habitat, primarily on wetlands in the Prairie Pothole Region of the United States. Wetland easements are perpetual and prohibit filling, leveling, draining, and burning of wetlands under easement. Wetland easements are a real property interest the Service has purchased from a willing landowner and are a permanent fixture to the land title. The land remains in private ownership. Since 1962, when the Wetlands Program began, the Service has acquired a perpetual real property interest in more than two million wetland acres for waterfowl production in the Great Plains states.

Grassland Easements

Conversion of grasslands to cropland has generated a need for upland habitat protection adjacent to wetlands. The loss of upland nesting cover and plant foods have reduced the value and productivity of wetlands for nesting waterfowl and their broods, and other migratory birds and wildlife. Grassland easements, like wetland easements, are perpetual easements that protect both existing and restored grasslands. The purposes of the perpetual grassland easement program are: to improve and protect the water quality of wetlands, maintain upland nesting habitat for ground nesting birds, protect highly erodible soils, and provide an alternative to the purchase of uplands in fee title, leaving land in private ownership. Grassland easements are real property interests that the Service purchases from landowners to prohibit any alteration of permanent grassland cover including cropland conversion or development, and haying or mowing until after July 15. Grazing is not prohibited or regulated under the grassland easement. Funding for grassland easements comes from a variety of sources including Migratory Bird Hunting and Conservation Stamp Act (with Governor approval), NAWCA grants, and Land and Water Conservation Funds.

ND FmHA Conservation Easements

These Conservation Easements were developed by the United States Congress under the Consolidated Farm and Rural Development Act of 1985 to help farmers reduce their debt load on farmland and to protect natural resources. The easement prohibits farming, mowing, haying, burning, filling, dumping, wood cutting, draining, or altering vegetation (includes grazing) on easement lands. Some wetlands on FmHA tracts have less restrictive easements that only prohibit draining, filling, leveling, or burning. Currently, the Tewaukon District has six FmHA Conservation Easements protecting 112 wetland and 45 grassland acres.

Waterfowl Production Areas (WPAs)

Management on fee WPAs is limited by funding, staff time, and the availability of cooperators. To efficiently maximize budgets and time, the planning team divided the WPAs into three priority management levels: high, moderate, or low. The criteria used to determine a WPA's ranking was size of the tract, potential waterfowl recruitment (See Map 14), and those with unique resources (i.e., tallgrass prairie, rare plants, and wildlife). A breakout of the priority level criterial for WPAs is as follows:

High Priority Level WPAs
- Over 160 acres in size
- Attract ducks 108 to 121 pairs/square mile (red) or 85 to 107 (yellow) on the thunderstorm map (Map 14)
- Had unique resources (tallgrass prairie areas)

Moderate Priority Level WPAs
- Between 100 to 160 acres in size
- Attract ducks 55 to 84 pairs/square mile (dark green); 37 to 54 pairs/ square mile (light green) on thunderstorm map (Map 14)
- Unique resources (native prairie)

Low priority level WPAs
- Under 100 acres in size
- Attract ducks 36 pairs/square mile (grey) to anything below 18 pairs/ square mile (blue) on thunderstorm map (Map 14)
- Access and management potential low

All Tewaukon District WPAs were placed in different priority levels and are listed in Appendix L and shown on Map 15.

Some management and activities would continue on all of the WPAs regardless of their priority levels. Those include:
- All WPAs will be open to hunting, fishing, and trapping according to North Dakota State regulations. All other public activities will require a Special Use Permit and will be evaluated to determine if they are compatible with District purposes.
- All border fences and signs will be maintained.
- Weed control will continue on all tracts.
- All WPAs would continue to receive law enforcement protection of resources and public safety.
- Roadside mowing will be done by October 1 according to State regulations.

The differences in habitat management for each of the priority levels are outlined in the objectives.

Many of the District habitat management, wildlife, and public use goals and objectives are similar to Refuge goals and objectives. Much of the supporting text for these goals and objectives is also similar. Supporting text and historical background for each section can be found in the Refuge portion of the Plan unless they are specific to the District.

Habitat Management

Goal: Preserve, restore, and enhance the ecological diversity of native flora, other grasslands, and wetlands within the Tallgrass Prairie wetland ecosystem.

> "The most remarkable features of this region are the intervals of level prairie....where the horizon is as unbroken as that of a calm seas...the long grass...bending gracefully to the passing breeze as it sweeps along the plain, gives the ideas of waves, and the solitary horseman on the horizon is so indistinctly seen as to complete the picture by the suggestion of a sail..."
> - John Lambert, topographer, report to Governor Stevens on a expedition from the Mississippi River to the Columbia River.

Grasslands

Native Prairie

Approximately 3,100 acres of native prairie are scattered on various Waterfowl Production Areas. Many of these areas were inaccessible for agriculture because they are sandy, rocky, or wet. Historically, management of these areas has consisted of some haying and limited grazing and fire. Disturbance events occurred infrequently leaving the majority of the native prairie tracts in a degraded condition. Nonnative plants such as smooth brome, Kentucky bluegrass, leafy spurge, Canada thistle, Russian olive trees, and sweet clover have invaded the sites.

The primary reason native prairie is not in better condition is the lack of periodic disturbance (ND Ecological Services Botanist, Kathy Martin 1993; Barbour et al. 1987; Duebbert et al. 1981). See Refuge section on native prairie for further discussion. For prescribed burning and wildfire objectives and strategies see Refuge Native Prairie Prescribed Burning Section.

Several objectives were developed by the planning team to manage and preserve native prairie sites.

Objective: Preserve, restore, and enhance diverse native floral communities so that greater than 75 percent of the plant species composition is composed of climax species on all native tallgrass prairie tracts on WPAs. (Refer to Heidel's Classification 1986 of floral communities of the tallgrass prairie ecosystem and desired indicator species in the Native Prairie Refuge section.)

Strategies:

- ✓ Develop a Monitoring Plan for native prairie on high priority level WPAs to determine species composition and relative abundance.
- ✓ Reduce exotic plants (leafy spurge, Canada thistle, Kentucky bluegrass, smooth brome, Russian olive trees, sweet clover) by 15 percent through chemical, mechanical, biological techniques, prescribed burning, and grazing.
- ✓ Continue to gather information on methods developed in the future for nonnative plant control techniques and their effects on the native flora and fauna.

Several nonnative plant species exist in District native prairie tracts including: leafy spurge, Canada thistle, Kentucky bluegrass, smooth brome, Canada thistle, yellow and white sweetclover, and Russian olive trees. These nonnative plant species can out-compete native plant species when frequent disturbances (grazing and burning) and nonnative plant control methods are not conducted. The District uses a variety of nonnative plant control methods including burning, mowing, chemical, and biological. Without disturbance and nonnative plant control, these species will increase and crowd out the native flora making the prairie unattractive to many of the prairie butterflies and grassland migratory birds.

Objective: Reduce by 15 percent (measured as canopy cover) nonnative plants (including leafy spurge, Canada thistle, Kentucky bluegrass, smooth brome, sweet clover, Russian olive trees) in the 3,100 acres of native prairie on Waterfowl Production Areas.

Strategies:
- ✓ Use a variety of techniques and tools including chemical, mechanical and biological methods, prescribed burning, and grazing.
- ✓ Continue to evaluate weed control methods for effectiveness and gather information on methods developed in the future.

Enhancing Native Prairie
Research outlined under the native prairie section in the Refuge portion of the CCP (See Refuge Habitat Grassland Section for more information) helped the planning team develop the next objective that addresses the management of contiguous blocks of grassland cover in the District for the benefit of grassland nesting migratory birds and prairie butterflies. Three sites were chosen to focus our grassland management. These sites were selected because they contained over 160 acres of upland habitat, have existing native prairie, were WPAs in the high priority level, had existing or potential for populations of native prairie butterflies, and had access for management. Under management, these prairie pieces should support a diversity of flowering plants needed by prairie dependent butterflies, one of our indicator species. If this management approach proves to be an effective method of habitat management and if additional funds and staff become available, the management will be expanded to additional high priority level WPAs in the District.

Objective: Manage three WPAs (Hartleben/Aasar WPA, Gainor WPA, and the Gunness WPA) (Map 15): 1) to achieve an area of contiguous grassland (greater or equal to 160 acres) that is greater than 50 meters from woody vegetation (greater than 1 meter tall); 2) contain a variety of vegetative heights on the area with 20 percent of the vegetation height ranging from 10 to 20 centimeters, 20 percent ranging from 20 to 30 centimeters, and 20 percent greater than 60 centimeters; 3) to increase native floral diversity so that greater than 75 percent of the vegetative composition is composed of indicator species of the dry mesic tallgrass, central mesic tallgrass prairie, wet prairie, mesic tallgrass prairie climax communities (Heidel 1986).

Strategies:
- ✓ Provide the critical limiting habitat factors outlined in the “Habitat-Based Approach to Management of Tallgrass Prairie” (Schroeder and Askerooth 2000) for a variety of vegetative heights, and no woody vegetation greater than 1 m tall on the three WPAs. Include specific management details of these areas in a step-down management plan.
- ✓ Develop a detailed Monitoring Plan for the three WPAs.
- ✓ Annually evaluate the vegetation using methods and techniques developed in the Monitoring Plan for the three WPAs and apply appropriate management tools (prescribed burning, mowing, grazing, interseeding, chemical treatment, etc.,) as appropriate to provide the limiting habitat requirements for migratory grassland birds and rare butterflies.

"Within one human lifetime, the prairies have passed from wilderness to become the most altered habitat in this country and one of the most disturbed, ecologically simplified and over-exploited regions in the world. The essence of what we risk losing when the grasslands are destroyed is not a species here or a species there, but a quality of life, the largeness and wildness that made this country remarkable."
- Adrian Forsyth, Ecologist

Protecting Native Prairie

Historically, an estimated 4,750,000 acres of tallgrass prairie was found in North Dakota. Currently, only 275,000 acres of tallgrass prairie remain, which is a 95 percent decline. An estimated 118,700 acres still remain in the Tewaukon District. The U.S. Forest Service manages 70,000 acres of land as the Sheyenne National Grasslands, the largest contiguous tract of native prairie (approximately 50,000 acres) in the District. The Service owns in fee title approximately 3,700 acres of native prairie in Ransom, Sargent, and Richland counties, and the Nature Conservancy owns 1,100 acres of native prairie in Ransom county. The remaining 60,900 acres are predominately in private ownership and have been identified in the 1998 report from the North Dakota Natural Heritage Program survey of tallgrass prairie in Sargent, Ransom, and Richland Counties. Currently, the Service has protected over 10,400 acres of tallgrass prairie through grassland easements from willing sellers with two NAWCA grants. Priority under NAWCA grants is given to native prairie tracts with good wetland complexes or unique and rare resources. Landowner demand for grassland easements has been high and a need exists for more funding. Currently, a Dakota Tallgrass Prairie Project is being developed to secure additional funds for grassland easements and fee title through Land and Water Conservation Act. This project includes the tallgrass prairie region in both North and South Dakota. The Dakota Tallgrass Prairie Project targets tallgrass prairie remnants that do not have high densities of associated wetlands.

Objective: Through a combination of voluntary partnerships, easements, and fee title land acquisition, preserve the remaining estimated 60,900 acres of existing native prairie tracts within the tallgrass prairie ecosystem to provide nesting areas for grassland nesting birds and protection for unique and rare plant and animal communities.

Strategies:

- ✓ Work cooperatively with the ND Heritage Program to identify remaining tracts of native prairie within the Red River Watershed.
- ✓ Work cooperatively with County commissioners to improve their recommendations to the Governor for State approval of fee title purchases of grassland habitat from willing sellers.
- ✓ Investigate and develop new funding sources (i.e., Dakota Tallgrass Prairie Project) for fee title and easement purchases. An estimated $5 million for easement offers will be needed to accomplish this objective.

Under the National Wildlife Refuge System Administration Act, 16USC 668dd, the U.S. Fish and Wildlife Service has the authority to enforce the provisions of grassland easements (conversion of grassland cover and haying or mowing before July 15). The following objective was developed to ensure that grassland easement interests are protected.

Objective: Protect all grassland easement real property interests from development or conversion in Ransom, Richland, and Sargent Counties.

Strategies:

- ✓ Annually monitor all grassland easement tracts for violations and work with landowners to correct any violations.
- ✓ Work cooperatively with landowners to develop grassland management plans and guidelines and provide technical assistance for grassland issues to promote healthier grasslands.

Introduced/Planted Cover

Dense Nesting Cover

The District has approximately 1,800 acres in dense nesting cover (DNC) on WPAs. Historically, haying has been the predominate management tool to maintain the fields. After 10 to 15 years, the fields have been broken up and farmed for approximately three years, then replanted. The following objectives have been developed to manage these sites.

Objective: Maintain 30 percent of DNC fields on High Management Priority WPAs and 10 percent on Moderate Management Priority WPAs with 7.87 inches (2 decimeters) observation obscurity to provide optimal nesting habitat for waterfowl.

Strategy:

✓ Develop a plan for DNC fields in the step-down Monitoring Plan to annually evaluate DNC fields and then apply management tools (prescribed burning, haying, grazing, or interseeding) as appropriate.

Planted Cover

There are approximately 1,800 acres of nonnative grass (smooth brome and Kentucky bluegrass), 82 acres of cropland, and 1,900 acres of warm seeded native grass (3 to 4 species) on the District. The majority of the cropland is in the form of food plots maintained by partners under the Adopt-A-WPA program on the Klefstad, Asche, and Smith WPAs. These fields will be converted to a more diverse native plant community as opportunity and funding become available.

Objective: Convert 400 acres of tame grass, cropland, and warm season native grass plantings on High Management Priority WPAs and 150 acres of Moderate Management Priority WPA fields to a diverse native floral community to develop larger contiguous blocks for migratory bird species and other prairie wildlife.

Strategy:

✓ Develop site specific restoration plans, funding sources, and a Monitoring Plan. Then begin restoration efforts. Apply management tools (prescribed burning, mowing, grazing, interseeding, chemical treatment, etc.,) where appropriate.

Wetlands

Very little data has been collected on WPA wetlands. A variety of agricultural operations (cultivation, herbicide application, etc.,) take place on sites that are hydrologically related to WPA wetlands. Without baseline data, it is difficult to determine if these activities pose any threats to wetlands. In addition, water management projects and irrigation in the vicinity of WPAs may be affecting the hydrology of these wetlands.

The following objective was developed to help managers evaluate the impacts activities outside WPAs have on wetlands.

Objective: Protect the quality and health of all prairie wetlands to preserve their natural productivity, longevity, and function on WPAs.

Strategies:

- ✓ Gather baseline information on existing wetland conditions on 10 percent of the High priority WPA wetlands, determine monitoring parameters, and identify external threats.
- ✓ Document and coordinate with the County Weed Board and State to control nonnative wetland species such as purple loosestrife and reed canary grass on and off Service lands.

Water Rights

The only water control structure on a Waterfowl Production Area is on the Gainor WPA in Sargent County. The structure is located adjacent to a legal drain that runs through the northern section of the WPA. The structure is used to hold water back in the spring in a large wetland. Currently, no State recognized water rights exist for Waterfowl Production Areas.

Objective: Clarify the legal mechanism to acquire water rights on the Gainor WPA.

Protecting Wetlands

It is estimated that approximately 60 percent of the original wetland acreage has been drained in North Dakota (Tiner 1984). The primary drainage comes from surface ditches constructed to dry land out for agricultural production (Tiner 1984). Another threat to wetlands is the gradual siltation of basins caused by soil erosion from adjacent cropland and cultivation of entire wetlands (Kantrud et al. 1989). Herbicide and insecticide use also has the potential to highly impact wetland-dependent wildlife populations by eliminating food and cover (Hudson et al. 1984; Hill and Camardese 1986). Despite the impacts to wetlands that are caused by agricultural production, wetlands in farm fields are important to wetland-dependent wildlife. Given this background, the following objectives were developed for wetland acquisition. Priority tracts for wetland acquisition (fee title) will include parcels of at least 80 acres of uplands, tracts adjacent to WPAs, and sites with a variety of temporary and seasonal wetlands.

Objective: Protect an average of 100 acres/year of wetland habitat through easements or fee title purchase from willing sellers for waterfowl and other migratory birds.

Strategies:

- ✓ Identify high priority tracts in the District using the Thunderstorm map and other tools.
- ✓ Work cooperatively with County commissioners to improve their recommendations to the Governor for State approval of fee title purchases of wetland habitat and associated uplands from willing sellers.

Under the National Wildlife Refuge System Administration Act, 16USC 668dd, the U.S. Fish and Wildlife Service has the authority to enforce the provisions of wetland easements (draining, filling, leveling, or burning of wetlands). This objective discusses the Service's intention to protect the real property interest that was acquired when the easement was purchased.

Objective: Protect all wetland easement real property interests from development, draining or conversion in Ransom, Richland, and Sargent Counties.

Strategies:
- ✓ Annually monitor, through aerial and ground checks, all wetland easements for violations.
- ✓ Work cooperatively with landowners to correct drain, fill, and burning violations.

Protecting Fens

A fen, also called an alkaline bog, is a wetland primarily composed of organic soil material (peat or muck) that takes thousands of years to develop. Surface water is sometimes lacking although the bottom soils are saturated by alkaline groundwater seepage (Stewart and Kantrud 1972). Fens usually have a pH of 4.0 - 7.5 and are dominated by grasses, especially sedges (Crum 1988). Common plant species found in fens are *Carex aquatilis* (sedge), northern reedgrass, broad-leaved cattail, softstem bulrush, hoary willow, and fowl mannagrass (Stewart and Kantrud 1972). Fens are extremely rare and occupy less than 1 percent of the wetlands in the nation and are usually small in size. No fens are identified on District lands. Since these wetland types are so rare, the following objective was developed to provide protection for these sites.

Objective: Identify and protect existing fens in the District through easements, fee title purchases from willing sellers, and cooperative agreements with private landowners.

Strategies:
- ✓ Work cooperatively with the ND Heritage Program, other interested groups or individuals and landowners to identify existing fens in the District.

Riparian Zones

Riparian zones can be described as that portion of the land that is located adjacent to a stream, river, or body of water. The band of vegetation that grows in the riparian zone is influenced by the presence of water in the channel. Three major rivers are in the District: the Red River of the North, Wild Rice River, and the Sheyenne River. Several smaller creeks and natural drainages are associated with these Rivers. Riparian vegetation varies along these areas from tall cottonwood trees to willows and grasses. Most of the riparian zones in southeast North Dakota are farmed to the river banks, heavily grazed, or annually hayed. These practices generally degrade water quality and native aquatic resources including fish, reptiles, amphibians, birds, mollusks, and invertebrates. Since riparian sites are known to be diverse in wildlife species and generally support higher population densities than surrounding uplands, the following objective was developed.

Objective: Improve water quality and native aquatic resources within riparian zones of the Red River of North Watershed within the riparian areas.

Strategies:
- ✓ Using existing USDA programs and other partner resources, develop opportunities under the Partners for Wildlife Program and NAWCA grants to establish vegetative riparian zones on 5 percent of land along rivers and tributaries in the Red River Watershed.
- ✓ Protect existing vegetation along rivers and tributaries in the Red River Watershed by working cooperatively with USDA, other agencies, organizations, and private landowners.

Wildlife

Goal: Preserve, restore, and enhance the diversity and abundance of migratory birds and other native wildlife with emphasis on waterfowl, grassland, and wetland-dependent birds.

Waterfowl

In 1985 and 1986, nest searches on five WPAs in the District were conducted. Three of the WPAs were trapped for predators during 1985 and two were not trapped. The average nesting success for the two WPAs that were not trapped was 17 percent (Mayfield). The three WPAs that were trapped had a nesting success of 33 percent (Mayfield). A nesting success of approximately 15 to 20 percent is suggested for stable duck populations of the five most common species of dabbling ducks (Cowardin et al. 1985, Greenwood 1986, Klett et al. 1988). The WPAs in the District are predominately surrounded by cropland, like islands of habitat in a sea of black dirt. In these types of severely altered landscapes, intensive management (such as predator control) might be the only way to increase nest success (Clark and Nudds 1991, Nudds and Clark, 1992). Using tools like the Thunderstorm Map (Map 14), which shows the correlation between duck pairs/square mile and wetland density, seven Waterfowl Production Areas that had the highest potential to attract ducks were chosen as areas to concentrate our most intensive management efforts.

Objective: Maintain an average duck nesting success of at least 30 percent Mayfield on seven WPA complexes in the district (Evanson/ Anderson, Evanson, Nelson/Klefstad, Palensky/Wyum/Kaske, Smith/ Tanner/Buckmiller, Englevale Slough, and Weaver/Coit) for waterfowl production (Map 15).

Strategies:

- ✓ Work cooperatively with Ducks Unlimited, Delta Waterfowl, local sportsmen, and private landowners to fund and implement a predator control program on these WPA complexes.
- ✓ If funded, annually monitor duck nesting success using standard nest dragging techniques for the seven WPA complexes.

Migratory Birds

For more information, see discussion on priority management areas for grassland migratory birds and butterflies in Refuge Habitat Grassland Section.

Objective: Monitor relative abundance and breeding status of four tallgrass prairie indicator bird species on the three WPAs as identified for grassland bird management and to provide feedback and information to the tallgrass prairie habitat management approach.

Strategy:

✓ Develop a step-down Monitoring Plan to address changes over time in relative abundance on a local scale and documentation of breeding of the four indicator species (northern harrier, upland sandpiper, bobolink, and grasshopper sparrow) on the three WPAs (Map 15).

Migratory Bird Disease Outbreaks

The first large disease outbreak in the Tewaukon District occurred in April 1990 near the town of Sheldon in Ransom County. Approximately 970 birds were collected from a large privately-owned wetland (160 acres in size) and from wetlands within a five mile radius. The majority of dead birds were snow geese. About six ducks and one Canada goose were also collected. The National Wildlife Health Center was never able to determine the cause of death although necrotic enteritis was suspected. Another large die-off of snow geese occurred in November 1990 on Kraft Slough in Sargent County. A total of 421 snow geese and one mallard were collected. In this incidence, the National Wildlife Health Center confirmed necrotic enteritis as the cause of the die-off.

In the fall of 1998, another disease outbreak occurred on the District. This outbreak occurred in some large wetlands in western Richland County and the Kraft Slough area in western Sargent County. Several sites were monitored, and birds were collected from each of the areas and sent to the National Wildlife Health Center. The total number of dead birds for all the sites was 3,873. A wide variety of birds were affected including American coots (1,450) and ducks, both divers and dabblers (1,530). The remaining number included shorebirds, grebes, gulls, egrets, cormorants, blackbirds, and rails. Botulism was determined by the National Wildlife Health Center to be the cause of death. Another botulism die-off occurred on the same wetlands in 1999. Coots and ducks were the predominate species found. Environmental conditions, dropping water levels, exposed mud flats, and hot temperatures provided favorable conditions for botulism.

Procedures for attempting to contain migratory bird disease outbreaks are similar for most of the diseases encountered on the District. These procedures include monitoring wetlands for dead or dying birds, immediate collection of dead birds, submitting specimens to the National Wildlife Health Center, and safe and proper disposal of the remaining carcasses. Promptly removing dead and dying birds from the disease outbreak area decreases the exposure that other birds and animals have to the carcasses.

Objective: Respond to and contain migratory bird disease outbreaks by applying safe and proper procedures as recommended by National Wildlife Health Center protocol.

Strategies:

✓ Submit carcasses to the National Wildlife Health Center for evaluation and determination of cause of death.

✓ Properly follow disease mitigation procedures to limit impacts to migratory bird populations.

Native Resident Wildlife

Mammals

Little is known about the native mammals on Waterfowl Production Areas. White-tailed deer use many of the WPAs in the District. Some of the other mammals include beaver, muskrat, mink, woodchuck, Franklin's ground squirrel, thirteen-lined ground squirrel, cottontail rabbit, white-tailed jackrabbit, badger, raccoon, and striped skunk. Not much is known about the variety of weasels, bats, shrews, mice, voles, and pocket gophers on District lands. No baseline surveys have been conducted for small mammals. The following objective was developed to collect baseline data that will enable managers to better manage and assess threats to wildlife resources.

Objective: Develop a Monitoring Plan to gather baseline data on small mammals on the following high priority WPAs: Hartleben WPA Complex; Gunness WPA; Biggs/Berndt WPA; Weaver/Coit; and Sargent County Krause WPA (Map 15).

Reptiles and Amphibians

Reports of reptile and amphibian species in the District include work by Hoberg and Gause (1992). Four species of toads (great plains, American, Canadian, and Woodhouse's) and three species of frogs (northern leopard, wood frog, and western chorus) have been documented in the District (Hoberg and Gause 1992). Hoberg and Gause (1992) reported specimens of the tiger salamander, mudpuppy (Ransom County), northern prairie skink, western painted turtle, common snapping turtle, plains garter snake, and western hognose snake. Red-bellied snakes have been observed by the Tewaukon staff on the Hartleben WPA.

Objective: Develop a Monitoring Plan to gather baseline data on amphibians and reptiles on the following high priority WPAs: Hartleben WPA Complex; Gunness WPA; Biggs/Berndt WPA; Weaver/Coit; and Sargent County Krause WPA (Map 15).

Upland Game Birds

One of the resident (nonmigratory) native birds on the District is the sharp-tailed grouse. Prior to 1900, this species was common throughout the State (Coues 1878, Johnson 1964, Judd 1892). Currently, sharp-tailed grouse are found predominately in the mixed-grass prairie that is relatively undisturbed by excessive grazing or farming (Stewart 1975). Sharp-tailed grouse group in the spring on communal dancing grounds called leks. No leks are currently known to occur on Fish and Wildlife Service lands. Occasionally birds have been observed on the Ransom County Waterfowl Production Areas. No prairie chickens are known to occur on District lands. See Refuge Resident Native Wildlife Section for discussion on prairie chickens.

Nonnative Wildlife

For further information on the Service's policy on nonnative wildlife, see the Refuge Wildlife Nonnative Section.

Objective: Restrict the spread of existing and additional nonnative animal species (carp, house sparrows, and feral dogs and cats).

Strategies:

- ✓ Gather existing information and promote additional research on management techniques and affects of exotic species on native flora and fauna.
- ✓ Apply, when appropriate, management tools (including lethal and nonlethal methods and habitat manipulation) that eliminate or reduce the expansion of exotic animal species.

Objective: Refrain from carrying out management activities that specifically encourage population expansion of existing introductions (pheasants, gray partridge) to the detriment of native species. For more discussion see Refuge Wildlife Nonnative Section.

"Extinction of species, the silent crisis of our time, diminishes our world...and a commitment to the preservation of species diversity is fundamental to an optimistic view of the future of our own species."
- Harrison B. Tordoff, 1988, *Minnesota's Endangered Flora and Fauna*

Endangered Species

Goal: Contribute to the preservation and restoration of endangered, threatened, rare, and unique flora and fauna that occur or have historically occurred in the District.

With the delisting of the peregrine falcon from the Federal Endangered Species List, only the federally threatened bald eagle and western prairie fringed orchid are known to occur or have been observed on the Tewaukon WMD. Bald eagles are regularly sighted during the spring and fall migration periods. Two endangered species, whooping cranes and gray wolves, historically occurred in the District. Occasionally, these species are sighted in the District today. The planning team did not develop management objectives for bald eagles since they are only migratory visitors to the District.

Whooping Cranes

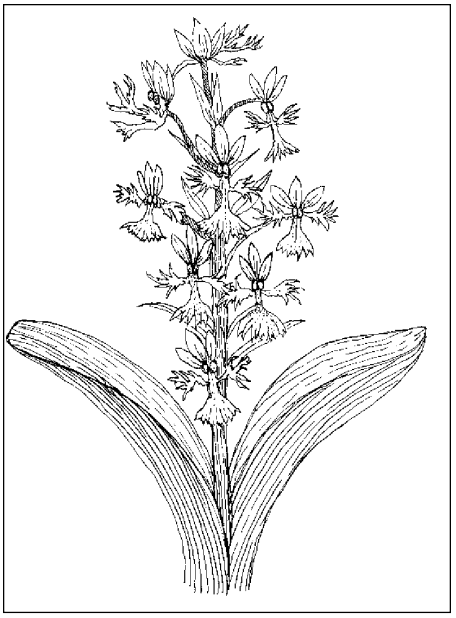
Whooping cranes historically nested in North Dakota. Records of whooping crane nests and young birds indicate that breeding birds once occurred locally on the southern Drift Plains, but were more common in the central and northeastern region (Stewart 1975). Whooping cranes more than likely migrated through the District. In June 1999, four whooping cranes were sighted in the Havana area by Refuge staff (visual observation documented by Siekaniec 1999). The planning team did not develop management objectives for whooping cranes since they are only rare migratory visitors to the District.

Gray Wolves

Historically, gray wolves were found throughout North Dakota and were known as plains wolves or buffalo wolves (U.S. Fish and Wildlife 1995). Gray wolves were extirpated from North Dakota through shooting, trapping, and poisoning but occasional sightings have been reported in 1985, 1990, and 1991. The planning team did not develop management objectives for gray wolves as they have not been regularly documented on the District.

Western Prairie Fringed Orchid

The western prairie fringed orchid is a perennial plant of the North American tallgrass prairie and is found in native, calcareous prairies and sedge meadows. The western prairie fringed orchid was listed as a threatened species under the Endangered Species Act in 1989. Approximately 90 percent of known western prairie fringed orchids in the United States occur in the Red River Valley of North Dakota and Minnesota. Currently, the largest population exists on the Sheyenne National Grasslands in Ransom and Richland Counties. The remaining plants are found on adjacent private land. Some of these areas are protected by Service grassland easements. No known populations of western prairie fringed orchids exist on Waterfowl Production Areas. The primary cause of the orchid's decline was conversion of prairie to cropland. Hydrologic changes that drawdown or contaminate the water table may also adversely affect the species (Fish and Wildlife Service Recovery Plan 1996). The Federal status of this plant requires the Service to develop strategies for recovery. The following objectives were developed because prairie fringed orchids are a federally listed threatened species. Current funding is available in two NAWCA grants to protect orchid habitat and the largest populations of these plants are found in Tewaukon District counties.



Western Prairie Fringed Orchid, Cindie Brunner

Objective: Work with the U.S. Fish and Wildlife Service Ecological Services Division, Forest Service, and private landowners with existing populations of western prairie fringed orchids to protect and enhance orchid habitat.

Strategies:

- ✓ Work with the ND Heritage Program to identify existing and historical populations of orchids on private land.
- ✓ Work cooperatively with private landowners to develop grazing systems and conservation plans to maintain self-sustaining orchid populations on private land.
- ✓ Work with the U.S. Fish and Wildlife Service Endangered Species Division to implement actions needed in the orchid recovery plan.
- ✓ Protect 300 acres of orchid habitat through grassland easements or fee title purchase from willing sellers.

Service Species of Concern

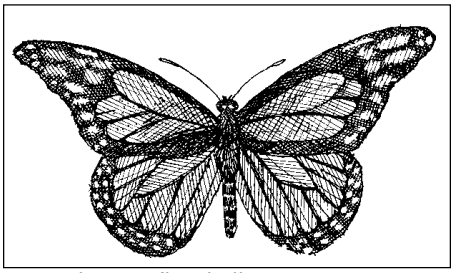
Species that appeared on the Fish and Wildlife Service Species of Concern List (1995) and occur or have historical records in the Tewaukon District include:

Birds:	Black tern
	Ferruginous Hawk
	Loggerhead shrike
Insects:	Dakota skipper
	Regal fritillary butterfly
Fish:	Greater redhorse
	Western silvery minnow ** (Red River - 1930)
Mollusks:	Elktoe
Plants:	Handsome sedge

** Species with historic records only.

Rare Birds

Black terns are associated with semipermanent and permanent wetlands with emergent stands of vegetation. Black tern young and nests have been observed throughout the District (Tewaukon staff notes). Ferruginous hawks appear to have been distributed throughout North Dakota but may no longer exist except as an occasional migrant in eastern section of North Dakota (U.S. Fish and Wildlife 1995). Loggerhead shrikes have been seen occasionally throughout the District, but no nests or territorial males have been recorded (Tewaukon staff notes). Stewart (1975) reports sightings of pairs and territorial males in all three Counties and a nesting record from 1950 to 1972 in the western edge of Richland County. Specific management objectives were not developed for black terns since District wetland habitat objectives would provide and protect habitat that would meet their needs.



Monarch Butterfly, Cindie Brunner

Rare Prairie Butterflies

Of particular interest are three rare prairie butterflies: the Dakota skipper, powesheik skipper, and the regal fritillary because they are only found on native prairie sites that have diverse plant communities. Dakota skipper habitat consists of mesic tallgrass to mid-grass native prairie. Larval foods include little bluestem and needle-and-thread grasses. Nectar plants include yellow and purple coneflower, white prairie clover, black-eyed susans, and white camus (Royer 1997). Powesheik skippers require undisturbed wet to mesic prairie habitat composed of sedges for larval food and available nectar sources that include yellow coneflower and black-eyed susans (Royer and Marrone 1992). The principal habitat requirements for the regal fritillary are large extensive native tallgrass prairie tracts with native violets and nectar supplies including long-headed coneflower, black-eyed susans, fleabanes, and blazingstars (Royer and Marrone 1992).

Two butterfly inventory surveys were conducted by Tim Orwig in 1995 and 1996 on a number of District prairie and wetland sites. In 1995, the Krause WPA and Hartleben WPA were surveyed, and in 1996, the Hartleben WPA, Aaser WPA, Krause WPA, Gunness WPA, and McGill WPA were surveyed. Powesheik skippers and regal fritillary butterflies were found on the Hartleben WPA, Krause WPA (Tewaukon staff sightings), and Aaser WPA. Powesheik skippers were observed on the Gunness WPA, a broad-winged skipper was spotted on the Aaser WPA, and one Dakota skipper was seen both in 1995 and 1996 on the Hartleben WPA. Presence of these rare butterflies on these isolated prairies requires specific management techniques designed to maintain their populations. Swengel (1996) suggested dividing prairie sites into smaller management units (one third of tract size) has been described as a preferred management technique in order to limit the impacts of a particular management activity like fire or haying affecting on the entire tract. Swengel (1996) found haying to be the favored management strategy to maintain skipper habitat and recommended large uniform management treatments be avoided.

The following objectives were developed to ensure the survival of native prairie butterfly populations.

Objective: Maintain populations of rare prairie butterflies including powesheik skipper, Dakota skipper, and regal fritillary on native prairie sites on the Hartleben, Aaser, and Gunness WPAs.

Strategies:
- ✓ Develop a Monitoring Plan to gather data on species occurrence, relative abundance, and locations of rare butterflies.
- ✓ Schedule management activities (prescribed fire, haying) on prairie sites with populations of prairie butterflies on small tracts. Avoid treating entire sites with the same tool in the same or following year.

Objective: Develop a Monitoring Plan to gather information on species composition and relative abundance on other known rare butterfly populations within the District on suitable sites every three years.

Objective: Evaluate reintroduction of the three rare butterflies on suitable native prairie sites.

Greater Redhorse
The greater redhorse is in the sucker family and prefers large streams with clear water and bottoms composed of clean sand or gravel. The greater redhorse has been found in the Red River of the North and lower Sheyenne Rivers; however, no recent observations have been made. The greatest threats to the redhorse are changes to its river habitat including, dams, channelization, pollution, destruction of riparian areas, and increased water speed and turbidity due to increased drainage into the river (U.S. Fish and Wildlife Service 1995). The planning team did not develop specific management objectives for greater redhorse as they are not known to occur on District Service lands.

Elktoe Mussel
The elktoe mussel is found in water of a specific depth and flow that provides a certain mix of river bottom components found in the riffle sections of streams (U.S. Fish and Wildlife 1995). The elktoe mussel is also listed on the American Fishery Society Endangered Species list as a species of "special concern." Specimens have been collected recently in the Red River of the North (U.S. Fish and Wildlife Service 1995). The planning team did not develop specific management objectives for elktoe mussels as they are not known to occur on District Service lands.

Handsome Sedge
Only three records exist for the handsome sedge in North Dakota, and they occur in Richland County in about one mile of river valley (U.S. Fish and Wildlife Service 1995). The planning team did not develop specific management objectives for handsome sedge as they are not known to occur on District Service lands.

Rare and Unique Species (North Dakota State Listed)

Animals

Northern (Greater) Prairie Chicken - State Threatened
Mountain Plover - State Extirpated
Pugnose shiner - State Endangered
Greater redhorse - State Threatened
Prairie skink - State Threatened

Plants

See Appendix C

Prairie Chicken

There has been a lot of debate over greater prairie chickens which were not thought to occur in North Dakota prior to the late 1870's (Stewart 1975). By 1884 prairie chickens were as common as sharp-tailed grouse and spread rapidly throughout the State (Stewart 1975). Downward population trends started in the early 1940's until by 1972 fewer than 400 birds existed in North Dakota (Johnson et al.1997). Several records indicated historical breeding on District lands (Tewaukon file records). In 1993, 50 prairie chickens were released on the Englevale Slough WPA Complex by the ND Game and Fish Department. In recent years, no prairie chickens have been found on the Englevale Slough WPA. The planning team did not develop specific management objectives for prairie chickens as they are not known to occur on District Service lands.

Mountain Plover

A record on July 29, 1921, (Lincoln 1925) reports a mountain plover in the vicinity of Carter's Slough near Hankinson in Richland County. This is the only known record for this bird in the District. The planning team did not develop management objectives for mountain plovers they are not known to occur on District Service lands.

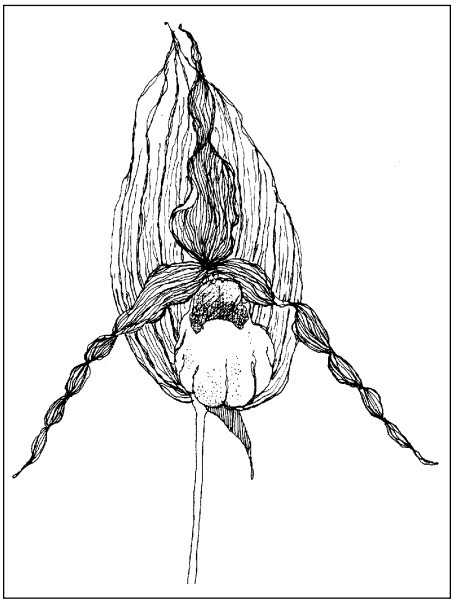
Prairie Skink

Prairie skinks were observed on the Hartleben WPA in 1997 and 1998. Prairie skinks are active during the summer and are found in sandy areas and grassland in eastern North Dakota. Specific management objectives were not developed for prairie skinks since District prairie habitat objectives would provide necessary habitat.

Rare Species Objectives

The following objectives were developed to direct the conservation of rare species utilizing protection and management techniques. Objectives also identify opportunities to conserve these species if any are found on Complex lands in the future. Consideration for other District management objectives that overlap with other agency and organization conservation goals and objectives would be taken into account.

Small White Lady's Slipper
The small white lady's slipper is a perennial plant in the orchid family. It is found in wet to mesic, calcareous, tallgrass prairies, sedge meadows, and fens. This plant needs full sun exposure or only light shade (Bowles 1983, Case 1987). It is ranked on the North Dakota Natural Heritage State List as "imperiled in the State." One of the largest population of white lady's slippers in North Dakota exists on the Hartleben WPA and averages approximately 200 plants. This site has historically been in an annual late haying regime. Haying and prescribed fire (early spring or late fall) are currently being applied on the site to maintain populations of lady's slippers.


White Lady's Slipper, Cindie Brunner

Objective: Maintain and monitor an average population of 200-300 small white lady's slippers on the Hartleben WPA.

Strategies:
✓ Develop a Monitoring Plan to measure species relative abundance and evaluate habitat management techniques including haying and prescribed burning.

Objective: Determine habitat suitability for North Dakota State listed rare and unique wildlife and plant species on WPAs within the district.

Strategies:
✓ Work cooperatively with ND Game and Fish Department, ND Heritage Program, and Nature Conservancy to initiate a baseline survey on suitable sites to determine presence or absence of these species on WPAs.

Objective: Protect North Dakota State listed wildlife and plant species habitat to maintain North Dakotas native biodiversity.

Strategies:
✓ Work cooperatively with Federal, State, local government agencies, nongovernmental agencies, and private landowners to identify, document, and protect critical habitat for State listed wildlife and plants through easements, fee title purchase from willing sellers, and cooperative agreements.

Public Use and Recreation

WPA tracts are open to hunting, fishing, and trapping according to Title 50 CFR. At this time, stocked fisheries are not developed on WPAs. The following objectives were designed to provide information to the public and some background about the wildlife and habitat resources found there.

Goal: Provide the public with quality opportunities to learn about and enjoy tallgrass prairie wetland ecosystems, the fish and wildlife, and history of the District in a safe and compatible manner.

Hunting and Trapping

Objective: Provide public opportunity for hunting and trapping according to State and Federal Regulations on all Waterfowl Production Areas.

Strategies:

- ✓ Work cooperatively with the ND Game and Fish Department to conduct law enforcement patrols on the District to ensure compliance and provide a quality experience for all visitors.

Interpretation/Environmental Education

Very little interpretation currently exists on Waterfowl Production Areas due to the long distances that are required to maintain sites and limited funding. All environmental education efforts for the Complex are conducted through the Refuge.

The General Federation of Women's Cultura Club of Hankinson has partnered with the Fish and Wildlife Service to develop an interpretive walking trail on the tallgrass prairie on the Hartleben WPA.

Objective: Through signs, pamphlets, and programs provide interpretation of the region's natural, cultural, and historical resources and District management and activities to promote public awareness and advocacy.

Strategies:

- ✓ Develop a District public use pamphlet and map.
- ✓ Maintain the prairie walking trail on the Hankinson WPA native prairie site to provide information and educational interpretation of tall grass prairie ecosystem.

Cultural Resources

No thorough cultural resource surveys have been conducted on the District. A few WPAs had cultural evaluations (Class I and II) conducted where rights-of-way or construction was proposed. Several historic trails are near or cross Waterfowl Production Areas. These trails include the Fort Ransom-Fort Wadsworth Trail which narrowly misses the Klefstad WPA and crosses the Lundstad WPA in Sargent County. The 1863 General Sibley Expedition may have crossed the J. Palensky WPA and the Metzen WPA where some native prairie remains. Colonel McPhail's return route in 1862 is believed to have crossed or come close to the Arneson, Blikre, Chose, Skonseng, Strander, Peterson, Holt, Grindstead, Weaver, and Dick WPA's in Ransom County. His party also traveled close to the Bauer WPA in Sargent County. The Twin Lakes Stockade, an overnight camp on the Fort Abercrombie-Fort Wadsworth Trail, is located one-half mile south of the Bladow WPA in Richland County (Refuge Manager Troester memo to Regional Director, January 31, 1972). An expedition to determine the suitability for a railroad occurred in 1853 to 1855 crossing Richland and Ransom Counties was documented by Issac Stephens. Two objectives were developed to improve baseline cultural resource data which will yield better information for refuge managers.

Objective: Conduct cultural resource inventories on construction and development sites as necessary.

Strategies:

- ✓ Work cooperatively with the Service archaeologist and SHPO (State Historic Preservation Officer) prior to all proposed actions.

Objective: Preserve and protect existing cultural resources and future discoveries of archaeological sites associated with Refuge lands.

Strategies:

- ✓ Annually conduct cultural resource surveys (Class II) on 10 percent of WPAs not previously surveyed.
- ✓ Coordinate and develop an agreement with the Sisseton-Wahpeton Sioux tribe on any discovery of human remains.

Partners

Goal: Promote partnerships to preserve, restore, and enhance a diverse, healthy, and productive tallgrass prairie ecosystem in which the District plays a role.

Objectives: Create opportunities for new and maintain existing partnerships among Federal, State and local agencies, organizations, schools, corporations, and communities to promote the understanding and conservation of ecosystem and Refuge resources, activities, and management.

Strategies:

- ✓ Maintain coordination with the ND Game and Fish Department to conserve, protect, and manage lands for wildlife.
- ✓ Continue to work with the Red River Area Sportsmen Club and the Sargent County Pheasants Forever on the Adopt-A-WPA program and look for other opportunities to improve the program.
- ✓ Implement and support the goals and complete the work detailed in the Drift Prairie Wetland Enhancement Project I and II funded under the North American Wetlands Conservation Act and the Dakota Tallgrass Prairie Project when funded.
- ✓ Preserve, restore, and enhance wetland, riparian, and grassland habitat on private lands.
- ✓ Work with other organizations to improve duck nesting success in the district on private lands especially in areas of high waterfowl recruitment (Zones of Opportunity). Organizations include ND Game and Fish Department, Ducks Unlimited, Delta Waterfowl, and Natural Resource Conservation Service.

Tewaukon Easement Refuges

Purpose

The purpose for the Tewaukon Easement Refuges is determined by legislation that authorized acquisition although the easement interest in these lands was acquired primarily to benefit migratory birds.

P Easement Refuges were established by Executive Order 6910 on November 26, 1934 which provided for acquisition of easements for flowage, refuge purposes (no hunting), and filing of water rights.

Habitat Management

Originally, five easement refuges existed in the Tewaukon District. These included: Tewaukon, Clouds Lake, Lake Elsie, Storm Lake, and Wild Rice Easement Refuges. When the Tewaukon National Wildlife Refuge was established, only three easement refuges remained, including Lake Elsie, Storm Lake, and Wild Rice. Two tracts of land on the south side of the Tewaukon Unit are easement refuges, and several flowage easements are on the west side of the Tewaukon Unit along the Wild Rice River. The landowners in these locations probably elected not to complete a fee title transaction at the time these transactions were completed on other portions of the Refuge. Over time, the structures that impounded water on Wild Rice and Storm Lake Easement Refuges deteriorated and were not repaired. Waterfowl use decreased with an increase in housing development, gravel pit development, and recreational boating on Lake Elsie. The Wild Rice Easement Refuge is no longer providing waterfowl values due to a lack of permanent water with the loss of the water control structure. Storm Lake is still important, especially for diving ducks and western and pied-billed grebes. It is located adjacent to the town of Milnor, and a golf course was developed on the north side in 1974 which included impacts to 1.7 acres of fee title property. An agreement between the Service and the Milnor golf course and City of Milnor has been implemented to minimize these fee title impacts.

In 1998, the Service divested Lake Elsie Easement Refuge after 53 years of human activity altered the privately owned uplands to the point where they provide little value for wildlife. It is the station's desire to eventually divest the Wild Rice Easement Refuge as well. Storm Lake is still beneficial to wildlife and should remain a part of the Refuge System. The easement refuge deed does not regulate any uses of the upland areas and makes it difficult to manage for wildlife purposes.

Objective: Protect all easement refuge property interests from hunting, draining, or conversion in Sargent County.

Strategies:
- ✓ Annually monitor two refuge easements for conflicts.
- ✓ Work cooperatively with landowners to resolve conflicts.

Objective: Divest the Wild Rice Easement Refuge as it no longer serves its original purpose.

Water rights for Wild Rice, Lake Elsie, and Storm Lake Easement Refuges were established in 1934 pursuant to Section 8270 (repealed 1943) of the Compiled Laws of North Dakota for the year 1913. The State Engineer's Office has raised questions about the validity of the water rights for the Wild Rice and Storm Lake Easement Refuges. The Service affirmatively relinquished the water rights for Lake Elsie in February 1999 after Congress terminated Refuge status.

Objective: Maintain existing water rights on Storm Lake Easement Refuge.

- ✓ Strategy: Replace/repair deteriorated structure at Storm Lake.

Kraft Slough

The initial stage of the Garrison Diversion Unit (GDU) project was authorized on August 5, 1965. As part of that authorization, Kraft Slough was to be developed as Taayer Reservoir. The Reservoir was designed to regulate irrigation flows in the lower James River Valley of the Missouri River basin and the Wild Rice River Valley of the Red River of the North. Taayer Reservoir and its associated wildlife area consisted of 8,385 acres. It included Kraft Slough, Pickell Slough, Lake Taayer, an unnamed wetland, and associated uplands in the area. This Plan was described in the Bureau of Reclamation's (Reclamation) Environmental Impact Statement, Initial Stage GDU, INT FES 74-3, January 10, 1974.

The GDU Reformulation Act of 1986 (Reformulation Act) was signed by the President on May 12, 1986. The Reformulation Act modified the 1965 GDU project authorization in several ways which would affect the disposition of Kraft Slough. Taayer Reservoir was de-authorized. The establishment of a refuge at Kraft Slough was authorized.

The Reformulation Act directs the Secretary of the Interior to "... acquire up to 5,000 acres in the Kraft and Pickell Slough areas and to manage the area as a component of the National Wildlife Refuge System giving consideration to the unique wildlife values of the area. In acquiring the lands which comprise the Kraft and Pickell Slough complex, the Secretary is authorized to acquire wetlands in the immediate vicinity which may be hydrologically related and nearby uplands as may be necessary to provide for proper management of the complex. The Secretary is also authorized to provide for appropriate visitor access and control at the refuge."

Reclamation has been acquiring lands to develop the Refuge and upon development, will transfer the administration of the Refuge to the U.S. Fish and Wildlife Service. The unit at this time consists of 1,695 acres purchased from willing sellers.

Due to concerns expressed by adjacent landowners and the public, the Service has conducted an evaluation of maintaining the hunting opportunities as they now exist when the area becomes a national wildlife refuge. The evaluation showed that the use would be compatible and could continue. Other than providing technical assistance, the Complex staff is not involved in the acquisition or management of the unit at this time. These responsibilities are currently the Bureau of Reclamation's until such time that acquisition is complete and the unit is transferred to the Service.

Implementation and Monitoring

Personnel

Current staffing at the Refuge consists of eight permanent and eight seasonal employees. One of the positions, Tallgrass Prairie Biologist, is shared with South Dakota. A recent national evaluation of complexity and minimum staffing requirements of the Complex indicated that an additional 10 permanent staff is suggested. Additional seasonal staff will be required to implement the strategies in the CCP and effectively monitor the flora and fauna, to determine if the goals and objectives in the Plan are met.

At this time, the Refuge has an annual base budget of $374,000 to maintain salaries for eight full-time permanent personnel and annual operating expenses for the Refuge and Wetland Management District. The current budget represents the minimum needed to maintain current annual activities and does not adequately support Complex habitat management, biological monitoring, maintenance, public use, and educational programs and all Complex facilities and structures.

The following chart shows the current staff and the proposed additional staff required to fully implement the CCP. If all positions are funded, the Refuge Complex staff will be able to carry out all aspects of this Plan. This would provide maximum benefits to wildlife, maximum efficiency, improve facilities and provide for increased public use. Projects that have adequate funding and staffing will receive priority to accomplish. Staffing and funding are requested for the 15-year period of the Plan.

Current	Proposed
Complex Project Leader, GS-13	Complex Project Leader, GS-13
Supervisory Refuge Operations Specialist, GS-11	Supervisory Refuge Operations Specialist, GS-12 Refuge Operations Specialist, GS-9/11
Complex Biologist, GS-9	Complex Biologist, GS-11 Biologist, GS-9 Biological Technician, GS-7
Seasonal Biological Technicians, GS-4 to GS-6 (2)	Seasonal Biological Technicians, GS-4 to GS-7 (3) Private Lands Biologist, GS-9
Tallgrass Biologist, GS-11*	Tallgrass Biologist, GS-12* Law Enforcement Officer, GS-11* Outdoor Recreation Planner. GS-11 Seasonal Public Use Staff, GS-7/9 (2) Fire Management Officer, GS-9*
Career Seasonal Range Technician, GS-6*	Career Seasonal Range Technician ,GS-7*
Seasonal Range Technicians, GS-3 to GS-6 (5)*	Seasonal Range Technicians, GS-3 to GS-6 (6)*
Administrative Assistant, GS-6/7	Administrative Assistant, GS-8 Administrative Assistant, GS-6/7
Equipment Operator, WG-10	Equipment Operator, WG-10
Maintenance Worker, WG-8	Maintenance Worker, WG-8 Career Seasonal Maintenance Workers, WG-8 Career Seasonal Tractor Operator, WG-7

*shared with other stations in North and South Dakota.

Funding Needed to Implement This Plan

Projects required to implement the Tewaukon CCP are listed in Appendix J. This Appendix shows the funding needed to implement the CCP through two different systems. The first system is the Refuge Operation Needs System (RONS). This documents requests to Congress for funding and staffing needed to carry out projects above the existing base budget. Amounts shown below include a start-up cost of implementing each program with actual yearly costs that are significantly less. The other system is the Maintenance Management System (MMS) which documents the equipment, buildings, and other existing property that require repair or replacement.

Twelve of the current RONS projects directly support the implementation of the CCP. A synopsis of the projects in priority order follow.

RONS Projects	Construction Funding	General Funding
1. Upland Restoration for grassland nesting birds		$ 209,000
2. Biological info. collection and monitoring to support management of wildlife and habitat		$ 254,000
3. Noxious plant control to improve habitat for wildlife		$ 148,000
4. Tallgrass restoration for declining grassland nesting birds		$ 325,000
5. Protection of resources including wetlands, grasslands, and safety of public		$ 270,000
6. Assistance to private landowners to improve wildlife habitat		$ 185,000
7. Improvement of staff facilities and support	$ 1,000,000	$ 155,000
8. Improvement of Public Education and Recreation Facilities and staff	$ 1,500,000	$ 383,000
9. Fire management program to improve wildlife habitat and protection of wildfires		$ 242,000
10. Protection, documentation, and interpretation of existing cultural resources		$ 77,000
11. Protection and clarifying of water rights on Complex to support water bird needs		$ 467,000
12. Predator control to improve grassland bird nesting success on the Complex		$ 382,000
TOTALS	$ 2,500,000	$3,067,000

Other funding needs include the maintenance or replacement of existing equipment and facilities. In the past, the Complex has had a large backlog of these funding needs. However, in recent years, much has been accomplished in funding these backlogs. Below is a list of remaining needs required to implement the CCP and maintain the structures and equipment to safe standards for the 15 years of the Plan.

Vehicles	$1,339,250
Equipment	$ 561,585
Public Use Facilities	$ 300,000
Buildings and Facilities	$ 50,000
Water Control Structures and dikes	$ 900,000
Roads, gates and fences	$ 73,500
	$3,224,335

A list of the top ten items is located in the Maintenance Management System list in Appendix J.

Step-Down Management Plans

Service managers have traditionally used the Refuge Manual to guide field station management actions. The policy direction given through the Manual has provided direction for developing a wide variety of plans which are used to prepare annual work schedules, budgets, public use, safety, and land management actions. The CCP is intended as a broad umbrella plan which provides general concepts and specific wildlife, habitat, endangered species, public use, and partnership objectives. The purpose of step-down management plans is to provide greater detail to managers and employees who will implement the strategies described in the CCP.

Under the CCP, the Complex staff will revise or develop several step-down plans for the Refuge and District. Complex step-down plans to be revised include:

Public Use Plan	Water Management Plan
Cropland Management Plan	Upland Management Plan
Fisheries Management Plan	Fire Management Plan

Staff will also develop Habitat and Wildlife Monitoring Plans.

Partners

Partnerships require extensive staff time to coordinate, develop, and maintain. Long-term commitments including funding and staff time are needed to maintain a strong and lasting relationship with partners. Without appropriate staffing, we run the risk of losing our current partners and not developing new partners. Several of the objectives in the CCP depend on partner support and funding. Many of our wildlife, habitat, and public use programs would not continue without the additional funding and support from partners. Without partners, many of the habitat protection, restoration, and enhancement projects would go unfunded. Over time, the diversity of wildlife species will begin to decline as the habitat degrades. Partners are essential in fully implementing the CCP for the Tewaukon Complex.

Monitoring and Evaluation

Adaptive management is a flexible approach to long-term management of natural resources that is directed over time by the results of ongoing monitoring activities and other information. Habitat, wildlife, and public use management techniques and specific objectives will be regularly evaluated as results of the monitoring program and other new technology and information become available. These periodic evaluations will be used over time to adapt both the management objectives and techniques to better achieve management goals.

Monitoring is an essential component of the CCP. Monitoring strategies have been integrated into many of the goals and objectives. Specific details including monitoring strategies, methods, techniques, and locations will be outlined in a step-down Complex Monitoring Plan. In this CCP, habitat monitoring receives the primary emphasis. Many of the wildlife species on the Complex are migratory birds. Migratory birds are impacted by a variety of factors (drought, disease, pollution, habitat destruction, etc.,) on their wintering and nesting grounds and all along their migration pathways. Determining whether or not a habitat manipulation on a Refuge field or wetland is wholly responsible for a Refuge migratory bird population change is difficult. Managers can strive to gather current information about the critical habitat needs for targeted species and then design Habitat Management Plans and strategies to met these needs. The habitat can then be monitored to determine if the management strategies are providing the critical habitat needs of a wildlife species. For example, if one of the critical habitat needs for bobolinks is vegetative structure at a specific density, managers can manipulate vegetation to achieve this structure and density. Whether or not bobolink use increases on the manipulated field, when the vegetation structure and density meet the conditions that bobolinks prefer, may or may not be directly tied to the manipulation. Monitoring bobolink populations in the manipulated field over a long period of time can provide some general local population trend information and document bird use. Managers must then carefully evaluate the bird use data to try and determine if a direct correlation exists to the habitat manipulation.

All habitat management activities will be monitored to assess whether the desired effect on wildlife and habitat components has been achieved. Baseline surveys will be conducted for wildlife species for which existing or historical numbers and occurrence is not well known. It is also important to conduct studies to monitor wildlife responses to increased public use including fishing, hunting, wildlife observation, and environmental education.

Monitoring should be designed and developed with Universities and/or Government research divisions when stringent protocols or complex data analysis is needed. Applied research can help to answer habitat, wildlife, and public use management questions. Complex staff will work with researchers to ensure that the research is applicable and compatible with Complex objectives.

This CCP is designed to be effective for a 15-year period. Periodic review of the CCP will be required to ensure that established goals and objectives are being met and strategies are being implemented. Ongoing monitoring and evaluation will be an important part of this process.

Key monitoring needs are identified throughout the CCP. A step-down Complex Monitoring Plan will incorporate and describe how, when, and who will conduct the monitoring.

Plan Amendment and Revision

The CCP will guide management on the Complex for the next 15 years. CCPs are ultimately signed by the Regional Director, Mountain Prairie Region 6, thus providing regional direction to the station project leader. A copy of the CCP will be provided to all those who are interested. The project leader at the station will review the CCP every five years to determine if it needs revision. In the case of severe circumstances, the project leader has the authority to modify management actions to respond appropriately. The Plan will be revised no later than 2015.

Comprehensive Conservation Plan Preparers

The planning team was comprised of:

Allison Banks, Planning Branch, Division of Realty
Sandra Siekaniec, Project Leader
Jack Lalor, Refuge Operations Specialist
Kristine Askerooth, Biologist
Brian Kietzman, Wildlife Resource Management Biologist, ND Game and Fish Department

The CCP and accompanying EA were written by Sandra Siekaniec, Kristine Askerooth, and Jack Lalor. Both documents were reviewed by Tewaukon Complex staff, Regional Office staff, Biological Resources Division, and other Service offices.

Appendix A. Tewaukon NWR Complex Species Lists

Tewaukon National Wildlife Refuge Complex Bird List

(Species known to nest on the Complex are marked with an *)

Loons	
Common Loon	*Gavia immer*
Grebes	
Pied-billed Grebe*	*Podilymbus podiceps*
Horned Grebe	*Podiceps auritus*
Red-necked Grebe*	*Podiceps grisegena*
Eared Grebe*	*Podiceps nigricollis*
Western Grebe*	*Aechmophorus occidentalis*
Pelicans	
American White Pelican	*Pelecanus erythrorhynchos*
Cormorants	
Double-crested Cormorant*	*Phalacrocorax auritus*
Bitterns, Herons, and Egrets	
American Bittern*	*Botaurus lentiginosus*
Least Bittern*	*Ixobrychus exilis*
Great Blue Heron*	*Ardea herodias*
Great Egret*	*Anlea Alba*
Snowy Egret	*Egretta thula*
Cattle Egret	*Bubulcus ibis*
Green Heron*	*Butorides virescens*
Black-crowned Night Heron*	*Nycticorax nycticorax*
New World Vultures	
Turkey Vulture	*Cathartes aura*
Swans, Geese, and Ducks	
Greater White-fronted Goose	*Anser albifrons*
Snow Goose	*Chen caerulescens*
Canada Goose*	*Branta canadensis*
Tundra Swan	*Cygnus columbianus*
Wood Duck*	*Aix sponsa*
Gadwall*	*Anas strepera*
American Wigeon*	*Anas americana*
American Black Duck	*Anas rubripes*
Mallard*	*Anas platyrhyncos*
Blue-winged Teal*	*Anas discors*
Northern Shoveler*	*Anas clypeata*
Northern Pintail*	*Anas acuta*
Green-winged Teal*	*Anas crecca*
Canvasback*	*Aythya valisineria*
Redhead*	*Aythya americana*
Ring-necked Duck	*Aythya collaris*
Lesser Scaup*	*Aythya affinis*
Bufflehead	*Bucephala albeola*
Common Goldeneye	*Bucephala clangula*
Hooded Merganser	*Lophodytes curcullatus*
Common Merganser	*Mergus merganser*
Red-breasted Merganser	*Mergus serrator*
Ruddy Duck*	*Oxyura jamaicensis*

Osprey, Kites, Hawks, and Eagles		
Osprey		*Pandion haliaetus*
Bald Eagle		*Haliaeetus leucocephalus*
Northern Harrier*		*Circus cyaneus*
Sharp-shinned Hawk		*Accipiter striatus*
Cooper's Hawk		*Accipiter cooperii*
Northern Goshawk		*Accipiter gentilis*
Broad-winged Hawk		*Buteo platypterus*
Swainson's Hawk*		*Buteo swainsoni*
Red-tailed Hawk*		*Buteo jamaicensis*
Ferruginous Hawk		*Buteo regalis*
Rough-legged Hawk		*Buteo lagopus*
Golden Eagle		*Aquila chrysaetos*
Falcons and Caracaras		
American Kestrel*		*Falco sparverius*
Merlin		*Falco columbarius*
Peregrine Falcon		*Falco peregrinus*
Prairie Falcon		*Falco mexicanus*
Gallinaceous Birds		
Gray Partridge*	Introduced	*Perdix perdix*
Ring-necked Pheasant*	Introduced	*Phasianus colchicus*
Sharp-tailed Grouse		*Tympanuchus phasianellus*
Greater Prairie-Chicken		*Tympanuchus cupido*
Rails		
Virginia Rail*		*Rallus limicola*
Sora*		*Porzana carolina*
American Coot*		*Fulica americana*
Cranes		
Sandhill Crane		*Grus canadensis*
Plovers		
Black-bellied Plover		*Pluvialis squatarola*
American Golden-Plover		*Pluvialis dominica*
Semipalmated Plover		*Charadrius semipalmatus*
Killdeer*		*Charadrius vociferus*
Stilts and Avocets		
American Avocet*		*Recurvirostra americana*
Sandpipers and Phalaropes		
Greater Yellowlegs		*Ttinga melanoleuca*
Lesser Yellowlegs		*Tringa flavipes*
Solitary Sandpiper		*Tringa solitaria*
Willet*		*Catoptrophorus semipalmatus*
Spotted Sandpiper*		*Actitis macularia*
Upland Sandpiper*		*Bartramia longicauda*
Hudsonian Godwit		*Limosa haemastica*
Marbled Godwit		*Limosa fedoa*
Ruddy Turnstone		*Arenaria interpres*
Red Knot		*Calidris canutus*
Sanderling		*Calidris alba*
Semipalmated Sandpiper		*Calidris pusilla*
Least Sandpiper		*Calidris minutilla*
White-rumped Sandpiper		*Calidris fuscicollis*
Baird's Sandpiper		*Calidris bairdii*
Pectoral Sandpiper		*Calidris melanotos*
Dunlin		*Calidris alphina*
Stilt Sandpiper		*Calidris himantopus*
Long-billed Dowitcher		*Limnodromus scolopaceus*
Common Snipe*		*Gallinago gallinago*
Wilson's Phalarope*		*Phalaropus tricolor*
Red-necked Phalarope		*Phalaropus lobatus*

Skuas, Jaegers, Gulls, and Terns

Franklin's Gull		*Larus pipixcan*
Bonaparte's Gull		*Larus philadelphia*
Ring-billed Gull		*Larus delawarensis*
California Gull		*Larus californicus*
Herring Gull		*Larus argentatus*
Caspian Tern		*Sterna caspia*
Common Tern		*Sterna hirundo*
Forster's Tern*		*Sterna forsteri*
Black Tern*		*Chlidonias niger*

Pigeons and Doves

Rock Dove	Introduced	*Columba livia*
Mourning Dove*		*Zenaida macroura*

Cuckoos and Anis

Black-billed Cuckoo*	*Coccyzus erythropthalmus*
Yellow-billed Cuckoo	*Coccyzus americanus*

Typical Owls

Eastern Screech-Owl	*Otus asio*
Great Horned Owl*	*Bubo virginianus*
Snowy Owl	*Nyctea scandiaca*
Long-eared Owl	*Asio otus*
Short-eared Owl*	*Asio flammeus*

Nightjars

Common Nighthawk	*Chordeiles minor*
Whip-poor-will	*Caprimulgus vociferus*

Swifts

Chimney Swift	*Chaetura pelagica*

Hummingbirds

Ruby-throated Hummingbird*	*Archilochus colubris*

Kingfisher

Belted Kingfisher*	*Ceryle alcyon*

Woodpeckers

Red-headed Woodpecker	*Melanerpes erythrocephalus*
Downy Woodpecker*	*Picoides pubescens*
Hairy Woodpecker*	*Picoides villosus*
Northern Flicker*	*Colaptes auratus*

Tyrant Flycatchers

Olive-sided Flycatcher	*Contopus cooperi*
Eastern Wood-Pewee*	*Contopus virens*
Willow Flycatcher*	*Empidonax traillii*
Least Flycatcher*	*Empidonax minimus*
Eastern Phoebe	*Sayornis phoebe*
Great Crested Flycatcher	*Myiarchus crinitus*
Western Kingbird*	*Tyrannus verticalis*
Eastern Kingbird*	*Tyrannus tyrannus*

Shrikes

Loggerhead Shrike	*Lanius ludovicianus*
Northern Shrike	*Lanius excubitor*

Vireos

Yellow-throated Vireo	*Vireo flavifrons*
Warbling Vireo	*Vireo gilvus*
Philadelphia Vireo	*Vireo philadelphicus*
Red-eyed Vireo*	*Vireo olivaceus*

Crows, Jays, and Magpies

Blue Jay*	*Cyanocitta cristata*
Black-billed Magpie	*Pica pica*
American Crow*	*Corvus brachyrhynchos*

Larks

Horned Lark*	*Eremophila alpestris*

Swallows

Purple Martin*		*Progne subis*
Tree Swallow*		*Tachycineta bicolor*
Northern Rough-winged Swallow*		*Stelgidopteryx serripennis*
Bank Swallow*		*Riparia riparia*
Cliff Swallow*		*Petrochelidon pyrrhonota*
Barn Swallow*		*Hirundo rustica*

Titmice and Chickadees

Black-capped Chickadee*		*Poecile atricapillus*

Nuthatches

Red-breasted Nuthatch		*Sitta canadensis*
White-breasted Nuthatch*		*Sitta carolinensis*

Creepers

Brown Creeper*		*Certhia americana*

Wrens

House Wren*		*Troglodytes aedon*
Winter Wren		*Troglodytes troglodytes*
Sedge Wren*		*Cistothorus platensis*
Marsh Wren*		*Cistothorus palustris*

Kinglets

Golden-crowned Kinglet		*Regulus satrapa*
Ruby-crowned Kinglet		*Regulus calendula*

Thrushes

Eastern Bluebird		*Sialia sialis*
Veery		*Catharus fuscescens*
Gray-cheeked Thrush		*Catharus minimus*
Swainson's Thrush		*Catharus ustulatus*
Hermit Thrush		*Catharus guttatus*
American Robin*		*Turdus migratorius*

Mimic Thrushes

Gray Catbird*		*Dumetella carolinensis*
Brown Thrasher*		*Toxostoma rufum*

Starlings

European Starling*	Introduced	*Sturnus vulgaris*

Wagtails and Pipits

American (Water) Pipit		*Anthus rubescens*
Sprague's Pipit		*Anthus spragueii*

Waxwings

Bohemian Waxwing		*Bombycilla garrulus*
Cedar Waxwing*		*Bombycilla cedrorum*

Wood Warblers

Tennessee Warbler		*Vermivora peregrina*
Orange-crowned Warbler		*Vermivora celata*
Nashville Warbler		*Vermivora ruficapilla*
Yellow Warbler*		*Dendrocia petechia*
Chestnut-sided Warbler		*Dendroica pensylvanica*
Magnolia Warbler		*Dendroica magnolia*
Yellow-rumped Warbler		*Dendrocia coronata*
Black-throated Green Warbler		*Dendroica virens*
Palm Warbler		*Dendrocia palmarum*
Bay-breasted Warbler		*Dendroica castanea*
Blackpoll Warbler		*Dendrocia striata*
Black-and-white Warbler		*Mniotilta varia*
American Redstart*		*Setophaga ruticilla*
Ovenbird		*Seiurus aurocapillus*
Northern Waterthrush		*Seiurus noveboracensis*
Connecticut Warbler		*Oporornis agilis*
Mourning Warbler		*Oporornis philadelphia*
Common Yellowthroat*		*Geothlypis trichas*
Wilson's Warbler		*Wilsonia pusilla*
Canada Warbler		*Wilsonia canadensis*
Yellow-breasted Chat		*Icteria virens*

Tanagers

Scarlet Tanager	*Piranga olivacea*

Sparrows and Towhees

Eastern Towhee	*Pipilo erythrophthalmus*
American Tree Sparrow	*Spizella arborea*
Chipping Sparrow	*Spizella passerina*
Clay-colored Sparrow*	*Spizella pallida*
Field Sparrow*	*Spizella pusilla*
Vesper Sparrow*	*Pooecetes gramineus*
Lark Sparrow*	*Chondestes grammacus*
Lark Bunting*	*Calamospiza melanocorys*
Savannah Sparrow*	*Passerculus sandwichensis*
Grasshopper Sparrow*	*Ammodramus savannarum*
Baird's Sparrow*	*Ammodramus bairdii*
Le Conte's Sparrow	*Ammodramus leconteii*
Nelson's Sharp-tailed Sparrow	*Ammodramus nelsoni*
Fox Sparrow	*Passerella iliaca*
Song Sparrow*	*Melospiza melodia*
Lincoln's Sparrow	*Melospiza lincolnii*
Swamp Sparrow	*Melospiza georgiana*
White-throated Sparrow	*Zonotrichia albicollis*
Harris' Sparrow	*Zonotrichia querula*
White-crowned Sparrow	*Zonotrichia leucophrys*
Dark-eyed Junco	*Junco hyemalis*
Lapland Longspur*	*Calcarius lapponicus*
Smith's Longspur	*Calcarius pictus*
Chestnut-collared Longspur*	*Calcarius ornatus*

Cardinals, Grosbeaks, and Allies

Snow Bunting	*Plectrophenax nivalis*
Rose-breasted Grosbeak*	*Pheucticus ludovicianus*
Indigo Bunting	*Passerina cyanea*
Dickcissel	*Spiza americana*

Blackbirds and Orioles

Bobolink*	*Dolichonyx oryzivorus*
Red-winged Blackbird*	*Agelaius phoeniceus*
Western Meadowlark*	*Sturnella neglecta*
Yellow-headed Blackbird*	*Xanthocephalus xanthocephalus*
Rusty Blackbird	*Euphagus carolinus*
Brewer's Blackbird*	*Euphagus cyanocephalus*
Common Grackle*	*Quiscalus quiscula*
Brown-headed Cowbird*	*Molothrus ater*
Orchard Oriole*	*Icterus spurius*
Baltimore Oriole*	*Icterus galbula*

Finches

Purple Finch	*Carpodacus purpureus*
House Finch	*Carpodacus mexicanus*
Red Crossbill	*Loxia curvirostra*
Common Redpoll	*Carduelis flammea*
Pine Siskin	*Carduelis pinus*
American Goldfinch*	*Carduelis tristis*
Evening Grosbeak	*Coccothraustes vespertinus*

Old World Sparrows

House Sparrow*	Introduced	*Passer domesticus*

Mammals with ranges within the area of Tewaukon National Wildlife Refuge Complex:

*Documented sightings

Arctic Shrew	*Sorex articus*
Masked Shrew	*Sorex cinereus*
Northern Water Shrew	*Sorex palustris*
Pygmy Shrew	*Microsorex hoyi*
Northern Short-tailed Shrew*	*Blarina brevicauda*
Least Shrew	*Cryptotis parva*
Keen's Myotis	*Myotia keeni*
Little Brown Myotis*	*Myotis lucifungus*
Eastern Red Bat	*Lasiurus borealis*
Hoary Bat	*Lasiurus cinereus*
Silver-haired Bat	*Lasionycteris noctivagans*
Big Brown Bat	*Eptesicus fuscus*
Eastern Cottontail*	*Sylvilagus floridanus*
White-tailed Jackrabbit*	*Lepus townsendii*
Woodchuck*	*Marmota monax*
Franklin's Ground Squirrel*	*Citellus franklini*
Richardson's Ground Squirrel*	*Citellus richardsoni*
Thirteen-lined Ground Squirrel*	*Spermophilus tridecemlineatus*
Eastern Fox Squirrel*	*Sciurus niger*
Red Squirrel	*Tamiasciurus hudsonicus*
Plains Pocket Gopher*	*Geomys bursarius*
Plains Pocket Mouse	*Perognathus flavescens*
Beaver*	*Castor canadensis*
Western Harvest Mouse	*Reithrodontomys megalotis*
White-footed Mouse	*Peromyscus leucopus*
Deer Mouse*	*Peromyscus maniculatus*
Northern Grasshopper Mouse*	*Onychomys leucogaster*
Southern Red-backed Vole*	*Clethrionomys gapperi*
Prairie Vole	*Microtus ochrogaster*
Meadow Vole	*Microtus pennsylvanicus*
Common Muskrat*	*Ondatra zibethicus*
Meadow Jumping Mouse	*Zapus hudsonius*
Western Jumping Mouse*	*Zapus princeps*
Coyote*	*Canis latrans*
Red Fox*	*Vulpes vulpes*
Common Raccoon*	*Procyon lotor*
Long-tailed Weasel*	*Mustela frenata*
Least Weasel	*Mustela nivalis*
American Mink*	*Mustela vison*
American Badger*	*Taxidea taxus*
Striped Skunk*	*Mephitis mephitis*
White-tailed Deer*	*Odocoileus virginianus*
Moose*	*Alces alces*

Historical

American Bison	*Bison bison*
Bobcat	*Lynx rufus*
Elk or Wapiti	*Cervus canadensis*
Gray Wolf	*Canis lupus*
Grizzly Bear	*Ursus horribilis*
Mule Deer	*Odocoileus virginianus*
Pronghorn Antelope	*Antilocapra americana*
River Otter	*Lutra canadensis*

Amphibians and reptiles with ranges within the area of Tewaukon National Wildlife Refuge Complex:

*Documented sightings

Mudpuppy*	*Necturus maculosus*
Tiger Salamander*	*Ambystoma tigrinum*
Eastern Tiger Salamander*	*Ambystoma tigrinum tigrinum*
Blotched Tiger Salamander*	*Ambystoma tigrinum melanostictum*
Gray Tiger Salamander	*Ambystoma tigrinum diaboli*
American Toad*	*Bufo americanus*
Great Plains Toad*	*Bufo congnatus*
Canadian Toad*	*Bufo hemiophrys*
Woodhouse's Toad	*Bufo woodhousii*
Gray Treefrog	*Hyla vericolor*
Western Chorus Frog*	*Pseudacris triseriata*
Common Snapping Turtle*	*Chelydra serpentina*
Painted Turtle*	*Chrysemys picta*
Prairie Skink*	*Eumeces septentrionalis*
Smooth Green Snake	*Opheodrys vernalis*
Red-bellied Snake*	*Storeria occipitomaculata*
Plains Garter Snake*	*Thamnophis radix*
Common Garter Snake*	*Thamnophis sirtalis*

Native Fish in the Red River Basin (Peterka and Koel 1996)

Chestnut lamprey	*Ichthyomyzon castaneus*
Silver lamprey	*Ichthyomyzon unicuspis*
Lake sturgeon	*Acipenser fulvescens*
Longnose gar	*Lepistoseus osseus*
Bowfin	*Amia calva*
Goldeye	*Hiodon alosoides*
Mooneye	*Hiodon tergisus*
Ciscoe	*Coregonus artedii*
Whitefish	*Coregonus clupeaformis*
Quillback carpsucker	*Carpiodes cyprinus*
White sucker	*Catostomus commersoni*
Northern hogsucker	*Hypentelium nigricans*
Bigmouth buffalo	*Ictiobus cyprinellus*
Silver redhorse	*Moxostoma anisurum*
Golden redhorse	*Moxostoma erythrurum*
Shorthead redhorse	*Moxostoma macrolepidotum*
Greater redhorse	*Moxostoma valenciennesi*
Central stoneroller	*Campostoma anomalum*
Largescale stoneroller	*Campostoma oligolepis*
Spotfin shiner	*Cyprinella spiloptera*
Brassy minnow	*Hybognathus hankinsoni*
Common shiner	*Luxilus comutus*
Silver Chub	*Macrhybopsis storeriana*
Pearl dace	*Margariscus margarita*
Hornyhead chub	*Nocomis biguttatus*
Golden shiner	*Notemigonus chrysoleucas*
Pugnose shiner	*Notropis anogenus*
Emerald shiner	*Notropis atherinoides*
River shiner	*Notropis blennius*
Bigmouth shiner	*Notropis dorsalis*
Blackchin shiner	*Notropis heterodon*
Blacknose shiner	*Notropis heterolepis*
Spottail shiner	*Notropis hudsonius*
Rosyface shiner	*Notropis rubellus*
Sand shiner	*Notropis stramineus*
Weed shiner	*Notropis texanus*
Mimic shiner	*Notropis volucellus*
Northern redbelly dace	*Phoxinus eos*
Finescale dace	*Phoxinus neogaeus*
Bluntnose minnow	*Pimephales notatus*
Fathead minnow	*Platygobio gracilis*
Blacknose dace	*Rhinichthys atratulus*
Longnose dace	*Rhinichthys cataractae*
Creek chub	*Semotilus atromaculatus*
Black bullhead	*Ameiurus melas*
Yellow bullhead	*Ameiurus natalis*

Brown bullhead	*Ameiurus nebulosus*
Channel catfish	*Ictalurus punctatus*
Stonecat	*Noturus flavus*
Tadpole madtom	*Noturus gyrinus*
Central mudminnow	*Umbra limi*
Northern pike	*Esox lucius*
Banded killifish	*Fundulus diaphanus*
Burbot	*Lota lota*
Trout-perch	*Percopsis omiscomaycus*
Rock bass	*Ambloplites rupestris*
Green sunfish	*Lepomis cyanellus*
Pumpkinseed	*Lepomis gibbosus*
Orangespotted sunfish	*Lepomis humilis*
Bluegill	*Lepomis macrochirus*
Smallmouth bass	*Micropterus dolomieui*
Largemouth bass	*Micropterus salmoides*
White crappie	*Pomoxis annularis*
Black crappie	*Pomoxis nigromaculatus*
Rainbow darter	*Etheostoma caeruleum*
Iowa darter	*Etheostoma exile*
Least darter	*Etheostoma microperca*
Johnny darter	*Etheostoma nigrum*
Yellow perch	*Perca flavescens*
Logperch	*Percina caprodes*
Blackside darter	*Percina maculata*
River darter	*Percina shumardi*
Sauger	*Stizostedion canadense*
Walleye	*Stizostedion vitreum*
Freshwater drum	*Aplodinotus grunniens*
Mottled sculpin	*Cottus bairdi*
Brook stickleback	*Culaea inconstans*

Introduced (nonnative) Fish

Rainbow trout	*Oncorhynchus mykiss*
Brown trout	*Salmo trutta*
Brook trout	*Salvelinus fontinalis*
Common carp	*Cyprinus carpio*
Flathead chub	*Platygobio gracilis*
Muskellunge	*Esox masquinongy*
Tiger muskie	*Esox lucius X E.masquinongy*
White bass	*Morone chrysops*

Appendix B. Plant Species Mentioned in CCP and EA

Alumroot	*Heuchera richardsonii*
American elm	*Ulmus americana*
Baltic rush	*Juncus balticus*
Bearded wheatgrass	*Agropyron subscundum*
Big bluestem	*Andropogon gerardii*
Black-eyed susan	*Rudbeckia hirta*
Blue grama	*Bouteloua gracilis*
Box elder	*Acer negundo*
Buckbrush	*Symphoricarpos occidentalis*
Broad-leaved cat-tail	*Typha latifolia*
Bur oak	*Quercus macrocarpa*
Canada goldenrod	*Solidago canadensis*
Chokecherry	*Prunus virginiana*
Fowl mannagrass	*Glyceria striata*
Green needle grass	*Stipa viridula*
Grey headed coneflower	*Ratibidia pinnata*
Handsome sedge	*Carex formosa*
Hardstem bullrush	*Scirpus acutus*
Hoary puccoon	*Lithospermum canescens*
Hoary willow	*Salix candida*
Indian grass	*Sorghastrum nutans*
Intermediate wheatgrass	*Agropyron intermedium*
June grass	*Koeleria pyramidata*
Leadplant	*Amorpha canescens*
Little bluestem	*Andropogon scoparius*
Intermediate wheatgrass	*Agropyron intermedium*
Maximilian sunflower	*Helianthus maximilianii*
Meadow anemone	*Anemone canadensis*
Narrow-leaved blazing star	*Liatris punctata*
Needle-and-thread	*Stipa comata*
Nodding lady tresses	*Spiranthes cernua*
Northern reedgrass	*Calamagrostis stricta*
Pasture sage	*Artemisia ludoviciana*
Porcupine grass	*Stipa spartea*
Prairie cordgrass	*Spartina pecinata*
Prairie dogbane	*Apocynum cannabinum*
Prairie sandreed	*Calamovilfa longifolia*
Prairie smoke	*Geum triflorum*
Prairie wild rose	*Rosa arkansana*
Purple coneflower	*Echinacea angustifolia*
Purple prairie clover	*Dalea purpurea*
Red elm	*Ulmus rubra*
Sand bluestem	*Andropogon hallii*
Showy milkweed	*Asclepias speciosa*
Sideoats grama	*Bouteloua curtipendula*
Small white lady's slipper	*Cypripedium candidum*
Sneezeweed	*Helenium autumnale*
Softstem bulrush	*Scirpus tabernaemontani*
Stiff goldenrod	*Solidago rigida*
Stiff sunflower	*Helianthus rigidus*
Switchgrass	*Panicum virgatum*
Tall blazing star	*Liatris pycnostachya*
Thimbleweed	*Anemone cylindrica*
Western prairie fringed orchid	*Platanthera praeclara*
Western wheatgrass	*Agropyron smithii*
White ash	*Fraxinus americana*
White aster	*Aster ericoides*
White camass	*Zigadenus elegans*
White prairie clover	*Dalea candida*
Wild lily	*Lilium philadelphicum*
Yellow coneflower	*Ratibidia columnifera*

Introduced

Alfalfa	*Medicago sativa*
Canada thistle	*Cirsium arvense*
Kentucky bluegrass	*Poa pratensis*
Leafy spurge	*Euphorbia esula*
Purple loosestrife	*Lythrum salicaria*
Reed canary grass	*Phalaris arundinacea*
Russian olive	*Eleagnus angustifolia*
Smooth brome	*Bromus inermis*
White sweet clover	*Melilotus alba*
Yellow sweet clover	*Melilotus officinalis*

Appendix C. ND State Rare and Unique Plant Species

These plant species are pulled from the ND Natural Heritage Program data files and only include species that are found in the Tewaukon WMD and are of greatest concern (S1 or S2).

North Dakota Natural Heritage State Rankings
S1 - Critically imperiled in state
S2 - Imperiled in state

Common Name	Scientific Name	ND Heritage Ranking
Adder's-tongue fern	*Ophioglossum pusillum*	S2
Bicknells sunrose	*Helianthemum bicknellii*	S1
Blue Cohosh	*Caulophyllum thalictroides*	S1
Bog Violet	*Viola conspersa*	S2
Brook flatsedge	*Cyperus bipartitus*	S1S2
Delicate sedge	*Carex leptalea*	S2
Dotted smartweed	*Polygonum punctatum*	S2
Downy hawthorn	*Crataegus mollis*	S1
Dutchman's breeches	*Dicentra cucullaria*	S1
Dwarf spikerush	*Eleocharis parvula*	S1S2
Early Panic-grass	*Panicum praecocius*	S2
Foxtail sedge	*Carex alopecoidea*	S2
Green kneeled cottongrass	*Eriophorum viridicarinatum*	S1
Handsome sedge	*Carex formosa*	S1
Hooked crowfoot	*Ranunculus recurvatus*	S1
Large yellow lady's slipper	*Cypripedium planiipetalum*	S2
Large-leaved pondweed	*Potamogeton amplifolius*	S2
Loesel's Twayblade	*Liparis loeselii*	S2
Low flatsedge	*Cyperdus diandrus*	S2
Marsh bellflower	*Campanual aparinoides*	S2
Marsh horsetail	*Equisetum palustre*	S2
Meadow horsetail	*Equisetum pratense*	S2
Meadow onion	*Allium canadense*	S1
Moonwort	*Botrychium minganense*	S1
Nodding ladies tresses	*Spiranthes cernua*	S1
Oakfern	*Gymnocarpium dryopteris*	S1
Prairie mimosa	*Desmanthus illinoensis*	S1
Purple sandgrass	*Triplasis purpurea*	S1
Richardson's sedge	*Carex richardsonii*	S1
Sensitive fern	*Onoclea sensibilis*	S2
Showy lady's slipper	*Cypripedium reginae*	S2
Sicklepod	*Arabis canadensis*	S1
Slendar cottongrass	*Eriophorum gracile*	S1
Small yellow lady's slipper	*Cypripedium parviflorum*	S2
Spiral sedge	*Carex convoluta*	S1
Spring cress	*Cardamine bulbosa*	S1
Southern watermeal	*Wolffia columbiana*	S2
Spiny naiad	*Najas marina*	S1
Stout wood reed	*Cinna arundinacea*	S1
Sweetflag	*Acorus calamus*	S2
Upright pinweed	*Lechea stricta*	S1
Wahoo	*Euonymus atropurpureus*	S2
W. Prairie fringed orchid	*Patanthera praeclara*	S2
White lady's slipper	*Cypripedium candidum*	S2
Wooly beach-heather	*Hudsonia tomentosa*	S1
Zigzag Goldenrod	*Solidago flexicaulis*	S1S2

Appendix D. Tewaukon Complex Water Rights

Tewaukon National Wildlife Refuge Water Rights

Declaration of Filing dated September 1, 1934, for Lake Tewaukon (Pool 1) and East and West White Lakes (Pools 12 and 11) (including Cutlers Marsh - Pool 2) for 7,198 acre-feet storage and 4,251 acre-feet seasonal use from the Wild Rice River.

Declaration of Filing dated September 1, 1934, for 397 acre-feet storage and 312 acre-feet seasonal use, for Cloud's Lake, now called Hepi Lake (Pool 8), from an unnamed tributary. Water use in Pools 5 through 10 are covered under this Right, with Hepi Lake to be drawn down to fill these pools.

Permit No. 1261, for 7,139 acre-feet from the Wild Rice River (4,852 acre-feet storage and 2,287 acre-feet seasonal use) for additional storage and seasonal use in Lake Tewaukon, Cutlers Marsh, and West White Lake; 409 acre-feet seasonal use to replace water diverted from the watershed by Sargent County Water Conservation District project; and total storage and seasonal use for Pools 3 and 4. The priority date is December 28, 1964.

Permit No. 1262, for 1,130 acre-feet (635 acre-feet storage and 495 acre-feet seasonal use) for Sprague Lake (Pool 14) from an unnamed tributary with a priority date of December 28, 1964.

Permit No. 1263, for 236 acre-feet for Mann Lake (Pool 13) and 450 acre-feet for Horseshoe Slough (Pool 16) for a total of 686 acre-feet from the Wild Rice River with a priority date of December 28, 1964.

Permit No. 3816, for 571 acre-feet (474 acre-feet storage and 97 acre-feet annual use) from the Wild Rice River for the Nickeson Bottoms, a tract owned jointly by ND Game and Fish Department, Bureau of Reclamation, and the Service. The priority date is August 15, 1985.

Wild Rice Easement Refuge Water Rights

Declaration of Filing dated September 1, 1934, for 80 acre-feet storage and 120 acre-feet seasonal use from the Wild Rice River.

Storm Lake Easement Refuge Water Rights

Declaration of Filing dated September 1, 1934, for 729 acre-feet storage and 516 acre-feet seasonal use from an unnamed tributary within the Wild Rice/Red River basin.

Appendix E. Key Legislation/Policies

(in alphabetical order)

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.

Bald and Golden Eagle Protection Act (1940): The Act prohibits the taking or possession of and commerce in bald and golden eagles, with limited exceptions. The enacting clause of the original Act stated that the Continental Congress in 1782 adopted the bald eagle as the national symbol; that the bald eagle became the symbolic representation of a new nation and the American ideals of freedom; and that the bald eagle threatened with extinction.

Clean Water Act (1977): Requires consultation with the Corps of Engineers (404 permits) for major wetland modifications.

Emergency Wetlands Resources Act (1986): The purpose of the Act is "To promote the conservation of migratory waterfowl and to offset or prevent the serious loss of wetlands by the acquisition of wetlands and other essential habitat, and for other purposes."

Endangered Species Act (1973): Requires all Federal agencies to carry out programs for the conservation of endangered and threatened species.

Executive Order 11987, Exotic Organisms (1977): This Executive Order requires Federal agencies, to the extent permitted by law, to: restrict the introduction of exotic species into the natural ecosystems on lands and waters owned or leased by the United States; encourage States, local governments, and private citizens to prevent the introduction of exotic species into natural ecosystems of the U.S.; restrict the importation and introduction of exotic species into any natural U.S. ecosystems as a result of activities they undertake, fund, or authorize; and restrict the use of Federal funds, programs, or authorities to export native species for introduction into ecosystems outside the U.S. where they do not occur naturally.

Executive Order 11988, Floodplain Management (1977): Each Federal agency shall provide leadership and take action to reduce the risk of flood loss and minimize the impact of floods on human safety, and preserve the natural and beneficial values served by the floodplains.

Executive Order 11990, Protection of Wetlands (1977): This order directs all Federal agencies to avoid, if possible, adverse impacts to wetlands and to preserve and enhance the natural and beneficial values of wetlands. Each agency shall avoid undertaking or assisting in wetland construction projects unless the head of the agency determines that there is no practicable alternative to such construction and that the proposed action includes measures to minimize harm. Also, agencies shall provide opportunity for early public review of proposals for construction in wetlands, including those projects not requiring an EIS.

Executive Order 12898, Environmental Justice (1994): This order provides minority and low_income populations an opportunity to comment on the development and design of Reclamation activities. Federal agencies shall make achieving environmental justice part of their missions by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low_income populations.

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 System.

Executive Order 13007 Indian Sacred Sites (1996): Directs Federal land management agencies to accommodate access to and ceremonial use 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.

Executive Order 13084, Consultation and Coordination With Indian Tribal Governments (1998): The United States has a unique legal relationship with Indian tribal governments as set forth in the Constitution of the United States, treaties, statutes, Executive orders, and court decisions. Since the formation of the Union, the United States has recognized Indian tribes as domestic dependent nations under its protection. In treaties, our Nation has guaranteed the right of Indian tribes to self-government. As domestic dependent nations, Indian tribes exercise inherent sovereign powers over their members and territory. The United States continues to work with Indian tribes on a government_to_government basis to address issues concerning Indian tribal self-government, trust resources, and Indian tribal treaty and other rights.

Federal Aid in Fish Restoration Act of August 9, 1950 (16 U.S.C. 777-777k), as amended: This Act, commonly referred to as the "Dingell-Johnson Act", provides aid to the States for management and restoration of fish having material value in connection with sport or recreation in marine or fresh waters. Funds from an excise tax on certain items of sport fishing tackle are appropriated to the Secretary of Interior annually and apportioned to States on a formula basis for approved land acquisition, research, development and management projects.

Federal Aid in Wildlife Restoration Act of September 2, 1937 (16 U.S.C. 669-669i), as amended: This Act, commonly referred to as the "Pittman-Robertson Act", provides to States for game and nongame wildlife restoration work. Funds from an excise tax on sporting arms and ammunition are appropriated to the Secretary of the Interior annually and apportioned to States on a formula basis for approved land acquisition, research, development and management projects and hunter safety programs.

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.

Fish and Wildlife Coordination Act of March 10, 1934 (16 U.S.C. 661-66c), as amended: This Act authorizes the Secretary of the Interior to assist Federal, State and other agencies in development, protection, rearing and stocking fish and wildlife on Federal lands, and to study effects of pollution on fish and wildlife. The Act also requires consultation with the Fish and Wildlife Service and the wildlife agency of any State wherein the waters of any stream or other water body are proposed to be impounded, diverted, channelized or otherwise controlled or modified by any Federal agency, or any private agency under Federal permit or license, with a view to preventing loss of, or damage to, wildlife resources in connection with such water resource projects. The Act further authorizes Federal water resource agencies to acquire lands or interests in connection with water use projects specifically for mitigation and enhancement of fish and wildlife.

Fish and Wildlife Act (1956): Established a comprehensive national fish and wildlife policy and broadened the authority for acquisition and development of refuges.

Fish and Wildlife Coordination Act (1958): Allows the Fish and Wildlife Service to enter into agreements with private landowners for wildlife management purposes.

Food Security Act of 1985 (Title XII, Public Law 99-198, 99 Stat. 1354; December 23, 1985), as amended: This Act authorizes acquisition of easements in real property for a term of not less than 50 years for conservation, recreation, and wildlife purposes.

Land and Water Conservation Fund Act (1965): Uses the receipts from the sale of surplus Federal land, outer continental shelf oil and gas sales, and other sources for land acquisition under several authorities.

Migratory Bird Conservation Act (1929): Establishes procedures for acquisition by purchase, rental, or gift of areas approved by the Migratory Bird Conservation Commission.

Migratory Bird Hunting and Conservation Stamp Act (1934): Authorized the requirement of an annual stamp for the hunting of waterfowl whose proceeds go towards the purchase of habitat for waterfowl and other wildlife. Duck stamps are also purchased for entry into some refuges, by conservationist and for stamp collections. Authorized 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. This Act enables the setting of seasons, and other regulations including the closing of areas, Federal or nonfederal, to the hunting of migratory birds.

National Environmental Policy Act (1969): Requires the disclosure of the environmental impacts of any major Federal action significantly affecting the quality of the human environment.

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 historic resources.

National Wildlife Refuge System Administration Act of 1966 as amended by the National Wildlife Refuge System Improvement Act of 1997, 16 U.S.C. 668dd-668ee. (Refuge Administration Act): Defines the National Wildlife Refuge System and authorizes the Secretary to permit any use of a refuge provided such use is compatible with the major purposes for which the refuge was established. The Refuge Improvement Act clearly defines a unifying mission for the Refuge System; establishes the legitimacy and appropriateness of the six priority public uses (hunting, fishing, wildlife observation and photography, or environmental education and interpretation); establishes a formal process for determining compatibility; established the responsibilities of the Secretary of Interior for managing and protecting the System; and 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.

National Wildlife Refuge System Improvement Act of 1997: Sets the mission and administrative policy for all refuges in the National Wildlife Refuge System. Clearly defines a unifying mission for the Refuge System; establishes the legitimacy and appropriateness of the six priority public uses (hunting, fishing, wildlife observation and photography, or environmental education and interpretation); establishes a formal process for determining compatibility; establishes the responsibilities of the Secretary of the Interior for managing and protecting the System; and 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 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.

North American Wetlands Conservation Act of December 13, 1989 (16 U.S.C. 4401-4412). Public Law 101-233 provides funding and administrative direction for implementation of the North American Waterfowl Management Plan and the Tripartite Agreement on wetlands between Canada, U.S. and Mexico.

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 anybody can participate in any program.

Water Resources Planning Act (1965): This Act establishes a cabinet_level Water Resources Council to study, coordinate and review water and related land resources requirements, policies and plans, and authorizes funding for states to plan and implement related programs.

Appendix F.
Environmental Assessment

Tewaukon National Wildlife Refuge Complex

including
Tewaukon National Wildlife Refuge
and
Tewaukon Wetland Management District

Comprehensive Conservation Plan

Prepared April 2000

Completed by Tewaukon NWR Complex Staff

Table of Contents

I. Purpose and Need for Action

The purpose of this Environmental Assessment (EA) is to determine the possible environmental consequences that the implementation of the Tewaukon National Wildlife Refuge Complex Comprehensive Conservation Plan (CCP) could have on the quality of the biological, physical, and human environment, as required by the National Environmental Policy Act of 1969. This assessment analyzes three levels of management intensity on the Tewaukon National Wildlife Refuge Complex (Complex). The preferred alternative, the CCP, is an intensive habitat and wildlife management program alternative designed to incorporate state of the art science based management practices and monitoring. The no action, or current management, alternative is science-based but narrower in scope than the CCP. This alternative reflects flat funding and no increases in staffing. The third alternative, custodial, that was considered is a management option that reflects the uncertain nature of Federal budgets. Frequently, downsizing, rightsizing, and cutting Complex programs are considered during budgeting processes. This alternative describes a reduced management and public use approach.

The U.S. Fish and Wildlife Service (Service) agreed to prepare refuge CCPs for each administrative unit of the Refuge System during the development of the National Wildlife Refuge System Improvement Act of 1997. Refuge managers are required to complete a CCP that describes how Refuge System management units will be acquired and managed to benefit wildlife. The Plan should also describe how available research will be incorporated into management. The management of the Complex should also be monitored and evaluated to determine if the desired habitat and wildlife responses occur. The Plan must address what Complex wildlife-dependent recreation and visitor opportunities are compatible and appropriate. The planning process also provides opportunities for the public and State and Federal agencies to provide input.

The CCP facilitates management continuity and describes management actions that will be made to achieve upland and wetland restoration, management, and enhancement for the next 15 years. The CCP is intended to provide long-range guidance for the management of the Tewaukon National Wildlife Refuge Complex (Complex) based on careful consideration of the physical and biological characteristics of the land base. It is designed to further achieve the U.S. Fish and Wildlife Service and National Wildlife Refuge System missions and the Tewaukon Complex goals and objectives which emphasize the protection and enhancement of wildlife and their habitats.

The planning team (see CCP List of Preparers) identified a need to better define what the future of Complex management should be in order to meet the intent of Complex establishing legislation, other refuge management legislation, and inform the public, State and Federal agencies, and interested groups and organizations. Some of the critical issues and challenges identified by the planning team and the public for consideration during the analysis of alternatives and development of the CCP (preferred alternative) are described next. These issues represent significant habitat, wildlife population, and public use aspects of Complex management that were used to evaluate the alternatives. The habitat and wildlife issues reflect local, regional, and National concerns. Locally, participants in the public input process indicated they would like to see additional emphasis on managing Complex habitats to benefit sport fish, white-tailed deer, and pheasants. Participants also indicated that Complex weed control efforts were important and that these efforts should continue and be improved. Public use issues are generally local and Complex specific, but have a national aspect since they are similar to public use issues throughout the National Wildlife Refuge System. Locally, participants in the public input process were interested in maintaining and increasing Complex hunting and fishing opportunities.

All references in this Environmental Assessment are included in Appendix K. Literature Cited.

Wildlife Habitat Fragmentation and Alteration

What was once a vast expanse of grass interspersed with wetlands, streams, and rivers in southeast North Dakota has been transformed into cropland bisected by roads, planted trees, railroad tracks, and other developments. Complex lands are some of the few sites that provide prairie ecosystem habitat in what has become a severely fragmented landscape.

The combined effects of human settlement and development have resulted in significant alterations to the native flora and fauna throughout the Northern Great Plains. These landscape scale alterations have affected Complex lands as well. Elk, bison, grizzly bears, and wolves are just a few of the wildlife species that have disappeared from the prairies of North Dakota. Prairies comprised of tall grasses including big bluestem, Indian grass, and porcupine grass with splashes of colorful wildflowers like golden Alexander, purple prairie clover, white lady's slipper, and blazing stars have been converted to cropland or are dominated by nonnative plants including Kentucky bluegrass, smooth brome, leafy spurge and Canada thistle. Many of the prairie butterflies and insects that once fluttered from coneflower to blazing star are gone or inhabit tiny remnant pockets of prairie.

As the wildlife species that once inhabited Complex lands changed in response to habitat alterations, the diversity of prairie wildlife populations declined and places for people to enjoy the diversity of these species were reduced. Wildlife habitat loss and declining species diversity continues.

Grasslands and Tallgrass Prairie - Threatened and Declining

Currently, less than 5 percent of native tallgrass prairie is left in North Dakota. The rest of the prairie was plowed up for crop production or developed. As a result, relatively few large contiguous blocks of native prairie remain. The largest area of tallgrass prairie left in eastern North Dakota exists on the Sheyenne National Grassland (50,000 acres), which is administered by the U.S. Forest Service. Most of the remaining native prairie lies around larger wetland edges, wet areas, rocky, and sandy areas that are difficult to convert to cropland. Many of the remaining native prairie sites are threatened due to an increase in irrigated agricultural practices and the development of large land leveling equipment. In 1998, more than 21,700 acres existed of irrigated crops, mainly potatoes and corn in the District (Ransom, Sargent, and Richland Counties). In 1990, irrigated crops were isolated and limited to only a few producers (ND Ag Statistics 1998). The once undesirable sandy soils of the Sheyenne Delta in Ransom and Richland Counties and southwestern Sargent County have become prime areas for irrigated crop production.

Approximately 3,716 acres of native prairie exist on the Complex. Most of these prairie areas are presently dominated by cool season nonnative grasses, such as smooth brome and Kentucky bluegrass. These nonnative grasses reduce plant diversity and vegetative structure and make habitats less attractive for the range of wildlife species that historically occupied prairie grassland habitats. Other nonnative, invasive plants include leafy spurge, Canadian thistle, Russian olive trees, and sweet clover. On many of these prairie acres, native warm and cool season grasses and forbs comprise less than 20 percent of the total vegetation. Trees have been planted in and around the perimeter of many of the prairies further shrinking the useable grassland area for many species of prairie birds and butterflies.

From a socio-economic standpoint, the impact of invasive plants and noxious weeds on cropland and pastures is routinely estimated to be in the millions of dollars in North Dakota. Weed control on Complex lands was identified by the public as an important program that would help limit the spread and the associated economic impacts of these species on adjacent lands.

As prairie habitats are lost and the plant communities that comprise them become more fragmented, prairie dependent wildlife species will also become increasingly rare.

Wetland Habitat and Value Declines

Early settlers in the midwest found numerous shallow wetlands or potholes scattered across the plains. These areas provided places for water, food, and hay for livestock. As development and agriculture expanded, many wetlands were drained or filled. An estimated 60 percent of the original wetland area has been drained in North Dakota (Tiner 1984). The rate of wetland loss in North Dakota continues at approximately 15,000 to 20,000 acres annually. Draining and filling wetlands to convert them for agricultural development or other types of development are the primary ways wetlands are being lost. Additional threats to wetlands include the gradual siltation of basins caused by soil erosion from adjacent cropland and the cultivation of entire wetland basins (Kantrud et al. 1989). Herbicide and insecticide use also has the potential to highly impact wildlife by eliminating food and cover (Hudson et al. 1984, Hill and Camardese 1986).

Prairie wetland ecosystems have many values to people and wildlife and provide important functions in the natural landscape. Wetlands can help to slow the flow of water runoff which can trap sediments and chemicals before the water flows into nearby streams and rivers. Upland and wetland plants can even absorb some of these nutrients and chemicals and turn them into organic matter. These filtering and trapping functions help to improve water quality of drinking water for human consumption, water for livestock, fish, and habitat for other aquatic wildlife. Wetlands also hold water and release it slowly over the surface and into the groundwater. This provides natural flood control during the springtime and helps to recharge aquifers. Many hunting, fishing, and wildlife observation enthusiasts enjoy the variety of recreation that wetlands provide. The diversity of habitats in a prairie wetland ecosystem provides associated wildlife with all their life needs. Wetlands are some of the most productive areas in the world. They provide food, water, and shelter to hundreds of wildlife species. Waterfowl, shorebirds, wading birds, songbirds, and some hawks all depend on wetlands as essential breeding, nesting, feeding, and resting areas. Many other species like ring-necked pheasants, grouse, white-tailed deer, and other animals rely on wetlands for winter cover from the harsh winds and temperatures. Wetlands also provide cover, food, and spawning areas for northern pike, minnows, freshwater mussels, and other aquatic species. As wetland habitat is lost, wetland values and opportunities decline for humans and wildlife.

Native Grassland Migratory Bird Population Declines

Herkert (1995) looked at the data from the North American Breeding Bird Survey between 1993 and 1996 and found that grassland migratory bird species are declining faster than any other group of breeding species in the Midwestern United States. Bobolinks and western meadowlarks showed the greatest decline (Herkert 1995). Habitat fragmentation is one of the causes of population decline in grassland birds (Samson 1980, Herkert 1994, Vickery et al. 1994). Habitat size is important for some grassland birds (Samson 1980, Herkert 1994, Vickery et al. 1994) and the amount of edge (the area where two different habitats overlap or are adjacent such as grassland and woodlands) of that patch of habitat is also important (Helzer and Jelinski 1999). Less than 1 percent of native prairie remains in North Dakota. As the native prairie and other grasslands are lost to agriculture and development, the amount of habitat for grassland birds also declines. In the southeastern part of North Dakota where land is intensively farmed, Complex grassland habitat is limited for this group of migratory birds.

Increased Public Use and Recreation Demands

Developing tourism has been a strategy in North Dakota economic development plans. Wide open spaces and associated fish and wildlife resources are a recurring theme in tourism marketing. Travelers are finding out about North Dakota. The number of visitors to the Complex has increased by 40 percent since 1990. More bird-watchers, vacationers, and out-of-state visitors stop in than ever before. The number of pheasant hunters and waterfowl hunters has also increased in the southeastern part of the State due to the population boom in Fargo and Wahpeton. Many of our visitors travel from Minnesota where the Complex is a convenient day-trip. As the number of visitors continues to grow, the demand for recreation and outreach will continue to expand.

During public input meetings, participants indicated they wanted more lakes open to fishing, longer boating seasons and hours, more hunting opportunities, and more access on the Tewaukon National Wildlife Refuge (Refuge). To meet the demands of a growing public without compromising the Complex's purpose, a comprehensive Public Use Plan should be developed to look at opportunities and the impacts to wildlife populations and habitat.

A variety of strategies have been used on the Complex to provide habitat for migratory birds and other wildlife. Early Complex acquisition and management efforts focused on planting upland cover on former cropland, developing water, and providing some crops as a food source. As the science of wildlife management evolves and the life needs of wildlife species are better understood, Refuge Managers need to incorporate new findings and techniques to refine or change management. Managers must also continue to evaluate what types of recreation, interpretation, and education should be offered on the Complex.

II. Alternatives Including the Proposed Action

The Proposed Action identified in this EA is an enhanced management alternative. Based upon input received during the public input comment period, the Service has made adjustments to its proposed alternative. This EA serves as a companion document for the draft Complex CCP. Both of these documents will be available for public review and comment prior to the issuance of a final CCP and EA. The public input process is described in detail in the CCP.

Development of Alternatives

Alternatives Considered and Eliminated from the EA

Several alternatives were considered when developing the EA. Some of the alternatives that were discussed but were eliminated from the detailed analysis are listed below.

Maximized Public Use Alternative

This alternative would have developed the Complex as a recreational area. All areas would have been opened to the public and many new facilities would have been built. Development might include wildlife hiking trails, parking lots, expansion of the Visitor Center and exhibits, expanding hunting seasons, and opening additional wetlands to fishing. This alternative was not analyzed in detail because it conflicts with the Complex purpose of serving as a refuge and breeding ground for migratory birds and other wildlife and the intent of the National Wildlife Refuge System Improvement Act, putting wildlife first.

Maximize Habitat Management and Eliminate Public Use Alternative

This alternative would have focused entirely on managing all Complex lands for wildlife with no public use except on Waterfowl Production Areas, where hunting, fishing, and trapping are permitted by regulation. The Refuge would be closed to all hunting, fishing, wildlife observation, and interpretation. All funds and effort would be directed to restoring, enhancing, and managing the Complex for the benefit of native flora and fauna. This alternative was not included because Congress and the Service have historically recognized the importance of providing compatible wildlife-dependent public uses on refuges.

The following three alternatives were developed in further detail and considered possible proposed actions. The alternatives represent a range of management intensity and focus that considers wildlife and their habitats first, specifically native prairie wetland ecosystem species. After discussion, research, and evaluation, Alternative C, Implementing the Enhanced Management Alternative described in the CCP, was selected as the preferred alternative.

Alternative A - Custodial

This alternative describes a custodial level of management for the Complex. The custodial alternative emphasizes almost total exclusion of human intervention from wildlife habitat and population management. This alternative is sometimes discussed by Regional and Washington, D.C. offices as a way to reduce costs or transfer resources to other priority programs in the Fish and Wildlife Service or to other parts of the country. Under this alternative, only basic obligations such as protection of government property, or actions required by law, like noxious weed control, would be carried out. Management and operations of the Complex would be restricted to what is minimally required by local, State, or Federal law.

No upland manipulation (haying, grazing, burning, interseeding) or water manipulation would take place except for noxious weed control. All agricultural areas would be taken out of production and seeded to grassland cover. Refuge habitats would evolve through the succession of native annual and perennial species as well as nonnative species.

Managed Refuge pools, including Lake Tewaukon, would be allowed to return to their natural drying and flooding cycles. No attempt to hold water back would occur; all water control structure boards on the four main dams on the Wild Rice River would be set at as close to natural elevation as possible, and remain there. All smaller water control structures would be removed, returning wetland edges and shorelines to their natural elevations. No information on water quality, water rights, or water use would be developed or gathered. Wildfires would not be suppressed except when they threatened Refuge buildings and adjacent private property.

No additional easement or fee title acquisition would be pursued. The Service would continue to enforce easements and regulations on the District.

Cultural resource sites on the Complex would continue to receive protection.

All Refuge roads would be closed (including the road around Lake Tewaukon). No public use, environmental education or outreach would occur on the Refuge including hunting, fishing, and wildlife observation. Hunting, trapping, and fishing would continue on WPAs according State regulations. Facilities (i.e., boat docks, signs, comfort stations, and auto tour) would be removed or donated to other agencies or groups. Environmental education programs would be discontinued, displays, and exhibits would not be maintained and would be removed as they deteriorated. The Refuge would be patrolled as a closed area.

Funding for the Complex would decrease to provide only necessary funding to support one manager and one maintenance worker, both with law enforcement duties.

Alternative B - No Action (Continue Current Management)

The No Action alternative would continue management of existing habitats, wildlife, programs, and facilities at current levels, and would not include extensive management and restoration of grassland habitats or wetland management improvements. Interpretive, educational and administrative programs and facilities would not change.

Refuge management would continue at current levels. Approximately 10 percent of uplands would be treated per year. There would be no attempt to increase wildlife and habitat management activities. The "No Action" alternative would not involve extensive restoration of upland habitats or the interseeding of planted grasslands to a mixture of native plants. Existing grasslands would support the nesting migratory birds they have in the past. No new effort would be made to manage and improve grasslands for nesting migratory birds and other wildlife. Active management practices such as prescribed fire, grazing, haying, mowing, and interseeding would not be expanded beyond current levels. Habitat data collection would continue at current levels. Integrated pest management would be emphasized. Noxious weed control would continue at the same level but would not be expanded. Natural processes, like fire, would be managed on a case-by-case basis depending on scheduled habitat management and risks to government and private property.

Wetland management emphasis would focus on waterfowl production and migration habitat. Tewaukon and Sprague Lakes would be primarily managed as open water rest areas. Total wetland acres would remain the same unless increased by natural flooding. No new actions would be planned to improve water use and water quality data collection or acquire additional water rights. Management actions that protect wildlife habitat, such as easement law enforcement, would continue at current levels. Additional biological information on Complex resources would not be expanded beyond incidental surveys. Land acquisition would continue at same rate.

Cultural resources would continue to receive protection through law enforcement.

Access roads would be managed as they are currently including minor upgrades and regular maintenance. Recreational opportunities would include current programs available under existing approved hunting, fishing, and public use plans. Only Lake Tewaukon and Sprague Lake would be open to fishing, and the Refuge would be open to limited deer and pheasant hunting. These opportunities would be limited so the Refuge would function as a refuge and breeding ground for migratory birds and other wildlife as described in establishing legislation. Hunting, trapping, and fishing would continue on WPAs according State regulations. Public use facilities would remain essentially the same and would be maintained. New interpretive signs, exhibits, and viewing opportunities would not be developed. Refuge law enforcement would continue at current levels. Environmental education and outreach would continue at the current level. No additional partners or funding would be pursued.

Complex funding would remain at the level needed to support current staffing and programs.

Alternative C - Implement the CCP (Proposed Action)

This alternative implements the Complex CCP goals and objectives and is the proposed action.

This alternative emphasizes native prairie and wetland ecosystem protection, management, and reestablishment. Management that favors native fauna and flora of the tallgrass prairie ecosystem will be emphasized. Some planted grasslands will be restored to a more diverse mix of native grasses and forbs. Increased management to improve habitat for migratory grassland nesting birds, rare prairie butterflies, and plant communities will be planned, conducted, and monitored. Grassland management for nesting waterfowl on the Complex will be continued and improved. Noxious weed control will continue and will be expanded to develop new ways to reduce or eliminate weeds. Integrated pest management would be emphasized.

Management of water levels in Refuge pools will continue for waterfowl production and resting areas but will be refined to correspond with water depths and stages between dry and flooded that occur in natural non-managed wetlands in order to benefit a greater range of species including shorebirds and wading birds. Tewaukon and Sprague Lakes will be primarily managed as open water rest areas. Water rights on the Complex will be clarified. The Refuge water use database will improve by the installation of data loggers and efforts will be initiated to collect better water quality data and improve water quality. Additional biological information on Complex resources will be expanded beyond incidental surveys to include baseline data collection, population trend data, and floristic surveys. Land acquisition will continue to focus on areas within the approved Refuge boundary, WPA round-outs, and increased efforts to purchase wetland and grassland easements and develop cooperative agreements with landowners on private land.

Cultural resources would continue to be protected and interpretative opportunities would be expanded. Additional cultural surveys would be conducted on the Complex.

Access roads would be managed at current levels including minor upgrades and regular maintenance. Recreational public use on the Refuge will be enhanced by improving existing facilities and programs. Only Lake Tewaukon and Sprague Lake would be open to fishing, and the Refuge would continue to be open to limited deer and pheasant hunting. Hunting opportunities would still be limited so the Refuge would function as a refuge and breeding ground for migratory birds and other wildlife as described in establishing legislation. Hunting and fishing programs will be reviewed to determine if opportunities exist to improve the quality of these public uses.

The Complex law enforcement program will become more effective. Improved resource and public safety protection will be achieved by adding law enforcement staff, funding, and increasing patrol time. Additional staff may provide the resources needed to expand fishing hours or provide additional hunting opportunities on the Refuge.

The Complex staff will expand educational and outreach programs to meet the increasing visitation and public interest in Complex environmental education programs. This will include developing new brochures, creating three new interpretive exhibits in the Visitor Center, expanding the Visitor Center, developing two walking trails, a Tewaukon web site, and increasing educational outreach to schools and community groups. Funding will be requested to staff the Visitor Center for extended hours, especially peak weekend visitor periods.

Additional Complex funding and staff would be needed to accomplish the goals and objectives in the CCP. Additional staff needed would include an outdoor recreation planner, assistant refuge manager, law enforcement officer, biological technicians, maintenance staff, an administrative support assistant, fire management officer, and a private lands person. Additional seasonal staff would be required from spring through fall to implement the management strategies on the Complex.

An increase in office space, facilities, and equipment will be needed to support the additional staff.

III. Affected Environment

Location

The Tewaukon Complex is composed of the Tewaukon National Wildlife Refuge (Refuge) and the Tewaukon Wetland Management District (District). The Complex is located in the drift prairie of southeastern North Dakota. The Refuge was established in 1945 and is approximately 8,343 acres in size. The District was established in 1958 and is comprised of over 14,000 acres of Waterfowl Production Areas (WPA), 35,000 acres of wetland easements, 10,386 acres of grassland easements, and 112 wetland and 45 grassland acres in FmHA easements in Ransom, Sargent, and Richland Counties.

Historical Landscape

Four major glacial periods impacted the northern plains during the Pleistocene Age (Pielou 1992). The most recent was the Wisconsin glacial stage which reached its maximum extent about thirteen thousand years ago (Mayewski et al. 1981). All the dominant landscape features of the Prairie Pothole Region are products of that geological event including prairie wetlands or “potholes” and the rich soil that gave rise to the tallgrass prairie.

Historically, the Complex landscape was a mix of tallgrass prairie and a variety of shallow and deep wetlands. No nonnative weed species were present at that time. Numerous native plant and wildlife species existed on the prairie and wetlands. Historical processes which maintained the vegetative and dependent wildlife communities included fire (Higgins et al. 1989), periodic defoliation by large herds of grazing animals (bison and elk), and weather (Eldridge 1992; Barbour et al. 1987).

As settlement of the Northern Great Plains increased, agriculture became the focus in the early- to mid- 1900’s. The rich landbase became devoted to agricultural production and drastically changed the grassland landscape (Duebbert et al. 1981). European settlement also drastically reduced the frequency and size of two of the processes which shaped the prairie grassland communities. The roaming herds of bison and elk were reduced in size and the scope of their impacts on habitat changed. Suppression of fire efforts of European settlers also increased. Settlers after the 1930’s began adding shelterbelts and wooded areas to the landscape to control soil erosion by the wind. The prairie that was once a treeless plain began to be invaded by woody species.

The Biological Environment

Grasslands and Tallgrass Prairie

Tewaukon NWR Complex is part of the tallgrass prairie ecosystem located in the southeastern portion of North Dakota. Tallgrass prairie is arguably one of the most fragmented landscapes in the country since much of it has been converted for agricultural production. Prior to acquisition, the majority of the Refuge and Waterfowl Production Areas were farmed. The remaining tallgrass prairie areas on the Complex (approximately 3,716 acres) are located in very wet areas, steep banks along wetlands and rivers, or in poor soils. They survive because these areas were undesirable as farmland, or were maintained as pasture for livestock.

The prairies evolved with two forms of periodic disturbance, grazing by large herbivores and fire. These processes were slowly removed from the landscape as settlers moved into the area and agriculture expanded. As a result, many of the native prairies today are heavily invaded by nonnative plants such as leafy spurge, smooth brome, Canada thistle, and Kentucky bluegrass. Many of the native grasses and forbs have been lost or are now a minor component of the prairie. Prescribed burning and grazing have been reincorporated into the management of the native prairie on the Complex in an attempt to invigorate the native plants and restore the prairie community.

Managing, protecting, and restoring tallgrass plant communities was identified by the planning team and other resource management professionals as an important issue during the CCP planning process.

Approximately 3,100 acres of dense nesting cover (DNC) has been planted on many fields in the Complex by Service personnel to provide habitat for ground nesting birds, primarily waterfowl. DNC fields lose their sweet clover component soon after the first year of planting and many DNC fields on the Complex have lost their alfalfa and wheat grass components as well. These fields are now dominated by nonnative grass species such as smooth brome and Kentucky bluegrass. These fields must be dug up and replanted every 10 years or so to maintain their attractiveness to nesting birds.

Planted native grass acres equal 2,581 on the Complex. Areas planted to native grasses are composed of 3 to 4 warm season native grasses usually big bluestem, Indian grass, switchgrass, and little bluestem. These fields are managed by spring prescribed burns and are in fair-to-good condition. Warm season native grass fields offer little in the way of species or structural diversity. Several of the fields are used as seed sources. More species of grasses and forbs are needed to mimic natural prairie communities which should support more diverse wildlife populations.

Approximately 2,866 acres of Complex tame grass fields are primarily composed of smooth brome and Kentucky bluegrass. These fields vary in their origin. Some were once planted to brome for rangeland or hayland when it was in private ownership, while others were once DNC or alfalfa fields which have become completely dominated by these cool season grasses. The vegetative structure and species composition of these fields dictates their attractiveness to migratory birds.

Wetlands

The Prairie Pothole Region (Figure 4) is named for the density of wetlands scattered across the landscape. Wetlands found in the southern Drift Prairie make up 13 percent of all wetlands in North Dakota and a great majority of these are less than 15 acres in area (Stewart 1975). A diversity of ephemeral, temporary, seasonal, semipermanent, and permanent wetlands in varying conditions can be found on the Complex.

Fens and alkali ponds are very rare; none have been documented on Complex lands. Approximately 38 managed semipermanent and permanent wetlands are on the Refuge. Historically, management of these wetlands has centered around holding water for waterfowl breeding, resting, and migration areas.

Managing, protecting, and restoring prairie wetland complexes was identified by the planning team and other resource management professionals as an important issue during the CCP planning process. How the Service enforced provisions of wetland easements, real property interests that were purchased to protect wetlands, was identified by the public as an important issue during the CCP planning process.

Native Grassland Migratory Birds

The Prairie Pothole Region is the principal waterfowl production area in the lower 48 states. North Dakota is a key State in this region. Twenty-one species of waterfowl breed in North Dakota (Stewart 1975). Twenty-one species of waterfowl use the Complex as a resting area during migration. Twelve species of ducks (mallard, gadwall, blue-winged teal, green-winged teal, widgeon, shoveler, pintail, lesser scaup, canvasback, redhead, wood duck, ruddy duck) and Canada geese nest on the Complex. Annual numbers of waterfowl fluctuate with wetland conditions. Waterfowl are commonly found on Complex lands and are popular game species that attract large numbers of visitors.

Other breeding grassland migratory birds on the Complex include the: bobolink, savannah sparrow, grasshopper sparrow, clay-colored sparrow, upland sandpiper, Le Conte's sparrow, vesper sparrow, short-eared owl, northern harrier, and Swainson's hawk. These birds use a variety of grassland habitats on the Complex as nesting, feeding, and resting areas.

Managing, protecting, and restoring grassland plant communities that support diverse and self-sustaining native breeding grassland bird populations was identified by the planning team and other resource management professionals as an important issue during the CCP planning process.

Other Migratory Birds

Thirty-seven species of shorebirds and 28 species of sandpipers commonly cross the interior Plains during spring and fall migrations (Skagen 1997). Habitat use by migratory shorebirds is concentrated in small shallow wetlands or wet muddy areas. Shorebirds inhabit North Dakota from mid-March through mid-October depending on weather and water conditions. Eighteen species of shorebirds breed in North Dakota (Stewart 1975). Twelve shorebird species have been documented by Refuge staff as breeding on the Complex.

Like other wetland dependent birds, the number of wading birds (herons, egrets, rails, bitterns) using the Complex fluctuates with the availability of water. A heron colony has existed on the Refuge since 1993 when water returned to southeastern North Dakota. Great blue herons, great egrets, double-crested cormorants, and black-crowned night herons nest in the colony located in dead trees in Pool 7A. No records of a heron colony on the Refuge were recorded prior to 1993.

Raptors, including eagles, hawks, falcons, and owls, are found on the Complex. The three most common hawks nesting on the Tewaukon NWR are the red-tailed hawk, northern harrier, and the Swainson's hawk. Great horned owls are the most common owl nesting on the Refuge. Several species of raptors migrate through the Refuge in the spring and fall including peregrine falcons, kestrels, ospreys, short-eared owls, golden eagles, sharp-shinned hawks, and cooper's hawks. The most notable migrants are bald eagles which follow the waterfowl migration and can be regularly seen around Lake Tewaukon and Sprague Lake in the spring and fall. During the winter, some raptors from Alaska, Canada, or northern Minnesota, including snowy owls, goshawks, and saw-whet owls, can be found on Complex lands.

Some woodland migratory bird species have increased in number in North Dakota from 1967 to 1993 such as the western kingbird, brown thrasher, and song sparrows. Other species like American robins, house sparrows, cliff swallows, and barn swallows are associated with people, trees, and structures (Johnson et al. 1997) and are found on the Complex.

Resident Birds

Only one species of native upland bird, the sharp-tailed grouse, is found on the Complex. Sharp-tailed grouse are few in number and spotted occasionally on the Complex. Ring-necked pheasants are commonly found on Complex lands and are a popular game species that attract large numbers of visitors. Black-capped chickadees, white-breasted nuthatches, brown creepers, woodpeckers, and blue jays are the other resident native birds that are found on the Complex. Managing Complex habitat to specifically benefit pheasants was identified as an important issue by the public during the CCP planning process.

Mammals

White-tailed deer are the only large mammals on the Complex. Occasionally, moose have been spotted near the Refuge or associated with WPAs. Deer are commonly found on Complex lands and are a popular game species that attract large numbers of visitors. Managing Complex habitat to specifically benefit deer was identified by the public as an important issue during the CCP planning process.

A small herd (1-15 animals) of pronghorn antelope resides in the Forman and Rutland area but do not spend much time on Complex lands.

Medium-sized mammals on the Complex include mink, muskrat, red fox, coyote, badger, beaver, jackrabbits, woodchuck, raccoon, striped skunk, and cottontails. No thorough inventory of the small mammals have been conducted on the Refuge or District. The following small mammals have been observed thirteen-lined ground squirrel, Franklin's ground squirrel, jumping mouse, and plains pocket gopher.

Fish

Lake Tewaukon and Sprague Lake have historically been managed at depths that support recreational fisheries. Northern pike, walleye, perch, and channel catfish are some of the sport fish in the two lakes. Native fish that exist in other wetlands and in the rivers are fathead minnows, bullheads, and sticklebacks. The common carp and the tiger muskie are two nonnative fish that were introduced into the lakes.

Managing and improving Refuge recreational fish populations, increasing the number of Complex wetlands that support recreational fish populations, and providing fishing opportunity was identified by the planning team, other resource management professionals, and the public as important issues during the CCP planning process.

Reptiles and Amphibians

Reports of reptile and amphibian species in the District include work by Hoberg and Gause (1992). Four species of toads (great plains, American, Canadian, and woodhouse's) and three species of frogs (northern leopard, wood frog, and western chorus) have been documented in the District (Hoberg and Gause 1992). Hoberg and Gause (1992) reported the occurrence of tiger salamanders, mudpuppys (Ransom County), northern prairie skink, western painted turtles, common snapping turtles, plains garter snakes, and western hognose snakes. Red-bellied snakes have been observed by Tewaukon staff on the Hartleben WPA and the Tewaukon Refuge. No thorough inventory of reptiles and amphibians has been conducted on the Refuge or District.

Threatened and Endangered Species

The bald eagle is the only federally endangered or threatened wildlife species documented on the Complex. This species is currently proposed for delisting as populations have recovered. Bald eagles can regularly be observed on Complex lands during migration periods. One threatened plant species, the western prairie fringed orchid is found on tracts that have been protected by grassland easements. By purchasing easements, the Service has bought the right to eliminate tillage or conversion native prairie sites where orchids are found.

Several species that are considered rare and unique by the U.S. Fish and Wildlife Service or the State of North Dakota exist on Complex lands including: black tern, ferruginous hawk, loggerhead shrike, regal fritillary and Dakota skipper butterflies.

Riparian and Native Woodlands

Complex native riparian vegetation, both woodlands and grasslands, are primarily located within the Wild Rice, Sheyenne, and Red River of the North floodplains. Grassland riparian vegetation is comprised of prairie cordgrass, northern reedgrass, a variety of sedges, and rushes. The native riparian woodlands are normally deciduous trees such as cottonwoods and willows and are found where moisture conditions allow for their growth.

The Physical Environment

Climate and Air Quality

Southeastern North Dakota climate is characterized by the extreme cold of winter, hot summers and rapid fluctuations of temperature. Periodic droughts and wet cycles occur over several years or sometimes within a year. Temperatures range from -35 degrees to 110 degrees Fahrenheit. Intense thunderstorms occur frequently during the summer; snow and high winds can produce blizzard conditions in the winter. Prevailing winds are from the northwest with the highest wind speeds normally occurring in the springtime. The wind exceeds 25 mph during 185 days of the year. Total annual precipitation is about 20.77 inches and is normally heaviest in late spring and early summer. The growing season is approximately 90 days long.

No special air quality standards exists for the Complex, but air quality in this area meets the six Federal Environmental Protection Agency standards set for particulate matter, sulfur dioxide, nitrous oxide, ozone, carbon monoxide, and lead. Permits from the ND Health Department are applied for prior to prescribed burning done on the Complex with ND Air Pollution Control Rules.

Soils

The soils within the three Counties comprising the Complex have been inventoried by the U.S. Soil Conservation Service. The dominant soils of Sargent County are Forman-Aastad loams. Ransom County soils are dominated by the Barnes Soil Association. Fargo silty clay and Embden-Tiffany are the two most common soil types in Richland County.

The majority of the upland sites in the Complex have high organic matter, nutrients, and adequate topsoil to establish and support grassland stands. Rolling topography generally limits water erosion to isolated drainage areas, but exposed soils can be subject to severe wind erosion if snow cover is limited. Upland areas with grass cover generally form a resilient sod which is not easily penetrated. Bare soil areas between bunch grasses or sites of animal burrows can be rapidly colonized by annual plants or invader plants.

Generally, these soils are extremely valuable for production agriculture. Despite the challenges presented by precipitation extremes and short growing seasons, the soils support small grain, row crop, and livestock production that generates the most common source of income in the State.

Hydrology

The most prominent wetland features throughout the Complex are glaciated "prairie potholes." These prairie wetlands are more numerous in Sargent and Ransom Counties (outside of the Red River Valley) but are found within the entire District. It is the richness and diversity of these wetlands that have historically been of primary interest to the Service in North Dakota. These prairie wetlands are extremely productive and very attractive to both migratory and resident wildlife. They serve as breeding, nesting, and rest areas for many migratory birds and as wintering habitat for many species of resident wildlife.

The Wild Rice River and its tributaries are the water source for the Tewaukon NWR. The Wild Rice River and its tributaries collect spring runoff from the Sisseton hills located to the south of the Refuge. Water enters the Refuge from the west and south and flows east through a series of impoundments. The Wild Rice River eventually enters the Red River of the North as is the case with the other major river systems in the District.

Wetland drainage and channelization of Wild Rice River tributaries has increased the amount of water, nutrients, and sediments coming into the Refuge.

The Sheyenne River in Ransom County is also a major tributary in the District that flows into the Red River of the North.

Unique Natural Resources

The Complex does not have any unique resources that would qualify as resource natural areas, wilderness, or wild and scenic rivers.

Cultural Resources

Two limited archaeological investigations have been done on the Refuge and only limited work has been done on a few of the Waterfowl Production Areas.

The majority of the cultural resource information for the Tewaukon NWR has been compiled in Jackson and 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." An additional report "Archaeological Test Excavations at Lake Tewaukon (325A211) documents a proto-historic occupation site in southeastern North Dakota (Haberman, 1978).

Historic (A.D. 1780 to present) sites on the Refuge include the Langie family cemetery on the western shore of Lake Tewaukon and the campsite of General Sibley's military troops at Camp Parker in July 1863 on the eastern shore of Parker's Bay. Several historic trails are near or cross Waterfowl Production Areas. These trails include the Fort Ransom-Fort Wadsworth Trail, the 1863 General Sibley Expedition, Colonel McPhail's return route in 1862, and parts of the Fort Abercrombie-Fort Wadsworth Trail. An expedition to determine the suitability for a railroad occurred in 1853 - 1855 crossing Richland and Ransom Counties was documented by Issac Stephens.

Less than 5 percent of the Tewaukon NWR has been surveyed for cultural resources. The majority of the cultural sites that have been documented are in gently sloping to moderately-well to well-drained soils.

Socio-economic Environment

Recreational Resources - Public Use

Tewaukon Refuge is the largest tract of publicly owned land in Sargent County and is a popular destination for approximately 15,000 people per year. The Refuge provides visitors with an auto tour route, opportunities for environmental education and interpretation, hunting, fishing, and wildlife observation. The Waterfowl Production Areas are open to the public for hunting, fishing, and trapping according to State regulations. An estimated 30,000 people use the District lands.

The Complex is approximately 90 miles southwest of Fargo, the largest city in North Dakota, 60 miles southwest of Wahpeton, and over 200 miles west of Minneapolis, MN. Several smaller towns of less than 1,000 people are located throughout the District.

An eight mile auto tour route is located along the north shore of Lake Tewaukon. It is open from May 1 through September 30 and closed in the spring and fall to minimize disturbance to migrating birds.

Hunting and fishing are the most popular activities on the Refuge. Many hunters are from the local area but an increasing number of hunters come from Minnesota and Fargo, ND. Hunting for two species is allowed on the Refuge, white-tailed deer and ring-necked pheasants. Hunters have two options to hunt white-tailed deer, an archery season and Refuge permit rifle season. The Refuge is also open to a Youth Deer firearms season in September. The Refuge pheasant season opens after the deer rifle season in November. Fishing is allowed on Lake Tewaukon and Sprague Lake year-round. Boat access for fishing is restricted to May 1 through September 30 to limit disturbance to migrating waterfowl. Five boat ramps (one accessible), an accessible fishing dock, picnic facilities, and outdoor rest rooms are located at the two lakes.

Hunting on the District is also very popular. Waterfowl Production Areas are open to all hunters, anglers, and trappers according to State regulations. No managed fisheries exist in WPA waters. White-tailed deer, waterfowl, and pheasant are the most popular species hunted on the District. With the majority of land owned by private individuals and posted closed to public hunting, WPAs offer important opportunities for public hunting.

No hiking trails exist on the Refuge. The east side of the Refuge is open to walking access for wildlife observation. One walking prairie trail has been developed on the Hartleben WPA.

Economics

Until recently North Dakota was predominately rural, but more than 50 percent of the State's residents now live in urban areas. Settlement began in southeastern North Dakota in the mid- to late-1800's. The Fargo population has grown from 32,580 people in 1940 to 180,000 people in 1998 (includes the Fargo and Cass County metro area). Fargo continues to grow at a rate of 1.5 percent each year. Wahpeton, a city of approximately 10,000 is located in Richland County and is approximately 60 miles east of the Complex. Wahpeton's population has a growth rate similar to Fargo's. The County seats are Forman for Sargent County, Lisbon for Ransom County, and Wahpeton for Richland County. The economic base of the State was predominately agriculture, but as North Dakota becomes more urban, agriculture related employment accounts for less than 50 percent of the work force. The growing employment sectors are retail, professional services, and durable manufacturing.

Approximate land acreage totals for the three Counties are as follows: Sargent County - 532,000 acres; Ransom - 592,000 acres; and Richland County - 927,424 acres. Land use is predominately agriculture. The majority of crop acres in the Complex are utilized for wheat (spring), soybeans, corn, and sugar beets in the Red River Valley. Average yields

vary by County. Cash rental rates in 1998 on agricultural lands ranged from $45.00 - $82.50/acre in Richland County, $35.00 - $57.00/acre in Sargent County, and $32.50 - $55.00/acre in Ransom County. Grazing occurs on a smaller scale in the three Counties. Approximately 92,000 head of cattle were reported in 1998 in all of the three Counties (ND Ag Statistics 1998) with an average pasture rental rate of $7.73/AUM (animal unit month).

Wildlife observation is the number one recreational activity in the United States today. This recreational activity is part of a new type of tourism, labeled "Eco-tourism." It is growing as the human population increases and becomes more urban and is looking for places to get away to natural areas for recreation. A 1995 Fish and Wildlife Service study was conducted on the economic impacts national wildlife refuges have on local economics. One of the 15 refuges chosen was the Upper Souris NWR in northwest North Dakota. The study found that over 46,000 visitors spent approximately $1.03 million during trips to this Refuge in 1995. Demands for lodging, food, gas, fishing, and hunting equipment and other goods created 32 jobs in two counties. Fish and Wildlife Service lands can boost local economies enormously.

Rural southeast North Dakota residents face increasing socio-economic challenges. The agricultural profit margin for the family farm is shrinking and operations are becoming bigger, diversifying, or failing to survive. Small towns are losing population, services, and tax revenue. In many ways, the Refuge fits into the picture as a small business would, by employing eight full-time people who spend money in the surrounding community. In addition, locally purchased supplies, machinery, and equipment used to accomplish Complex operations supports community businesses. Complex recreational visitors also generate local business income. Management activities like Complex grazing, farming, and haying provide business opportunities for area agricultural producers.

An issue that hinders acquisition efforts and strains Service/community relationships is Refuge Revenue Sharing. The Service Revenue Sharing payment has seldom been paid in full, and when it is, it still does not equal the tax revenue paid by other County residents. Service efforts in the Complex will always be less effective until the Revenue Sharing payment is comparable to local taxes.

The majority of Refuge and District users and neighbors understand that the Service manages Refuge lands for migratory birds and WPAs for waterfowl production, and most have a general appreciation for the value of wildlife and their habitats. Refuge visitors also appreciate the variety of recreational opportunities that Complex lands offer. However, these visitors expect the land to be managed and not ignored. Their opinions of the Service, wildlife agencies, environmental groups, and wildlife in general are greatly influenced by the way these lands are managed. If a WPA is ignored, allowing the habitat condition to decrease in quality and noxious weeds to increase in abundance, opinions quickly become negative. However, if the land is managed well and wildlife populations and habitat conditions are productive, opinions become positive and wildlife benefits both on- and off-Service managed lands. As with all public land management, communication, cooperation, and education between the local community and managers drives public perception of the agency and its management.

Environmental Justice

In accordance with Executive Order 12898, Federal Actions to address Environmental Justice in Minority Populations and Low-Income Populations, Federal agencies must identify and address disproportionately high and adverse human health or environmental effects of their programs policies and activities on minority populations and low-income populations. The evaluations considered potential impacts, including social and economic, cultural, and physical and biological resources.

IV. Environmental Consequences
Alternative A: Custodial
Wildlife Habitat Fragmentation and Alteration

This alternative would not address habitat fragmentation since opportunities to acquire, manage, or protect important wildlife habitat would be suspended. The Service would not capitalize on any opportunities to acquire key habitat that would help to prevent fragmentation. In addition, a reduced habitat management strategy would result in the slow, but inevitable colonization of key habitats like native prairie by trees and nonnative plants. Upland habitats would become less attractive to grassland nesting birds as the vegetative structure and species diversity of Complex grasslands decline. An overall decline of plant and animal species richness would occur.

Grassland and Tallgrass Prairie

In the short-term, nesting cover for migratory birds would increase as croplands would be seeded to grassland cover.

With the exception of an occasional wildfire, this management alternative would eliminate all major defoliation and disturbance events required to maintain diverse and healthy grasslands. Residual vegetation would build up suppressing new growth. Height, density, and diversity of vegetation would decline. This would be especially apparent on the native prairie areas where the native plant diversity would decline as tracts evolve into monotypic stand of nonnative grasses. Nonnative plant species would increase due to the decreased health of the native plants and their subsequent inability to compete. Prairie butterfly populations would decrease as the native prairie areas are treated too infrequently. The essential nectar and larval food sources for prairie butterflies of prairie grasses and forbs would disappear as the grasslands lose diversity because of the decrease in disturbance events. Attempts to convert grasslands to diverse native prairie plant communities would not be sustained and prairie dependent species would not increase.

The diversity and structure in Dense Nesting Cover (DNC) fields would also decrease without periodic disturbance. These fields would also evolve into monotypic stands of nonnative grass species. Woody species such as buckbrush and Russian olive trees would invade the grasslands. No degraded grassland tracts would be reseeded to diverse native plant communities. Under this alternative, weed control would continue to be conducted at levels required to meet legislative standards, but no new techniques would be explored. Weed control should ensure that the impact to adjacent landowners from Complex weeds does not increase.

Law enforcement would continue on all Complex uplands and grassland easements to help prevent this resource from being hayed early, converted to cropland, or developed.

Wetlands

Wetlands would not be managed and conditions would be the result of natural processes as wetlands go through the range of drying and flooding. Wetlands would not be managed to hold water for longer periods of time; instead, they would fluctuate seasonally and yearly. A greater range of habitat conditions would provide conditions for a greater range of wildlife species. The levels of Lake Tewaukon and Sprague Lake would mimic original shallow levels which may encourage vegetative growth. These lakes may not provide open water migratory bird resting habitat if vegetation responds. Shallow lake levels would decrease the amount of bank erosion around these lakes and reduce carp, which should reduce sedimentation and turbidity. Overall water quality on the Refuge is not likely to improve if efforts to address watershed impacts along the Wild Rice River are not taken. Non-managed wetlands would continue to function naturally except for the exclusion of fire and grazing processes, which should not measurably affect their productivity. Law enforcement would continue on all Complex lands and the Service's wetland easement interests would be enforced. No efforts to protect additional wetland habitat interests through acquisition would occur.

Native Grassland Migratory Birds

Initially, more nesting cover would be available for birds after cropland was seeded. Waterfowl nesting attempts would still be driven by area wetland conditions. Over time, under the custodial alternative, waterfowl production would decrease as the health, density, and vigor of Complex grasslands declines. Most of the grasslands would become unattractive for nesting ducks. Predator control would be discontinued, and waterfowl nest success would decline below population sustaining levels. Complex wetlands would still provide good resting and feeding areas for migrating waterfowl. No cropland food source for waterfowl would exist on the Refuge which may make the Refuge less attractive to migrating waterfowl and might cause additional problems for adjacent landowners.

Use of grasslands on the Complex by migratory grassland nesting birds such as the bobolink, grasshopper sparrow, upland sandpiper, etc., and prairie butterflies would decrease. As the grasslands change to less diverse stands of nonnative grasses and grassland structure deteriorates, use by nesting grassland birds would decline. The invasion of more woody plants would also make complex lands less attractive to grassland nesting birds as they avoid selecting nest sites adjacent to trees.

Other Migratory Birds

Wetland dependent migratory birds such as yellow-headed blackbirds, herons, egrets, cormorants, shorebirds, marsh wrens, and others would be positively affected by this alternative. Managed wetlands would reach a greater range of conditions (dry to full) than they do currently. A broader range of conditions will make them more biologically productive over time. The plant biomass, that develops as wetlands dry out, will support a large waterbird response when they refill. As wetlands dry out, additional habitat will be available for shorebirds. Wetland migratory bird use would still be dependent on local and regional wetland conditions.

Species that are dependent on trees, such as yellow warblers, thrushes, and Northern orioles, may be negatively affected by this alternative if native woodlands decline over time.

Resident Birds

Initially, more nesting cover would be available for birds after cropland was seeded. Over time, under the custodial alternative grassland nesting populations would decrease as the health, density, and vigor of the Complex grasslands declines.

The only native game bird that occasionally uses the Refuge is the sharp-tailed grouse. Grouse may initially colonize the Refuge as croplands are seeded down, but are unlikely to be attracted to the upland cover as species structure and diversity decline. Despite more extensive grasslands, grouse are likely to remain incidental on all Complex lands. Additionally, grassland easements which protect grassland habitats from conversion would not be acquired under this alternative. Grassland habitat is the main limiting factors for sharp-tailed and prairie chickens on the Complex. These species would initially benefit from this alternative but would continue to decline as grassland habitats on the District are converted to cropland or development.

Ring-necked pheasant populations may decline under this alternative. Managing habitat for pheasants generally consists of providing alternating blocks of grassland nesting cover, tree and shrub plantings for winter cover, and croplands for food sources. Seeding down all Refuge croplands would not provide the same amount or type of habitat that is currently available. Predator control would also be discontinued under this alternative. Increased predator numbers may reduce the nest success and recruitment of all grassland nesting birds, including pheasants.

Managing Complex habitat to specifically benefit pheasants was identified by the public as an important issue during the CCP planning process. The public perception that the seeding of Refuge cropland to grass would be detrimental to pheasant populations can be anticipated in this alternative. Pheasant hunting would also be terminated under this alternative which would be very unpopular. The perception that pheasant populations would decline and the elimination of pheasant hunting would generate political pressure to maintain food plots for pheasants and permit hunting seasons.

These impacts are not anticipated on District lands where hunting would still occur.

Mammals

Deer are commonly found on Complex lands and are a popular game species that attract large numbers of visitors. Deer hunting would be terminated under this alternative. Managing Complex habitat to specifically benefit deer was identified by the public as an important issue during the CCP planning process.

Refuge deer numbers are likely to increase under this alternative, and while they may obtain some food from sources on the adjacent ND State Wildlife Management Area, expanding populations may damage Refuge vegetation and are likely to damage crop and hay supplies on adjacent private lands. Larger deer populations and damage to surrounding crops and hay supplies would generate political pressure to maintain food plots for deer and permit hunting seasons. These impacts are not anticipated on District lands where hunting would still occur.

Small predators such as raccoon, skunk, and fox would not be controlled under this alternative, and their numbers would be self-regulating. Their populations would be higher under this alternative.

Fish

Managing Complex wetlands to support recreational fishing was identified by the public as an important issue during the CCP planning process.

Managing Refuge lakes at historic shallow levels is likely to eliminate the recreational fisheries in Tewaukon and Sprague Lakes. The Lake Tewaukon aerator would no longer be used. Water would not be deep enough in these lakes for fish to survive the winter. While the reduction of other species, such as carp, may result in small improvement in water quality, agricultural runoff throughout the watershed has a much greater impact on water quality. It is likely that any water quality improvement caused by the reduction in carp numbers will not be measurable.

The likelihood that the recreational fish population in these lakes would be lost would generate political pressure to maintain the two lakes at elevations that support this activity and would decrease public support of the Refuge.

No fisheries are established on District lands.

Reptiles and Amphibians

Little impacts to these populations are anticipated with this alternative though these species may do slightly better on the croplands that are seeded back to grass.

Endangered and Threatened Species

The only endangered wildlife species component on Complex lands is migration habitat for bald eagles. No significant impact would occur under this alternative.

Western prairie fringed orchid populations on grassland easement tracts would still be monitored. No effort would be made to continue to protect prairie habitats that contain these species from being converted to cropland or other development through additional easement and fee acquisition. Chances for this species to maintain self-sustaining stable populations would decrease.

Rare species and species of concern (wildlife and plant species) on District lands would be adversely affected. The white lady's slipper, Dakota skipper, and the powesheik skipper populations on the Hartleben WPA would decline as habitat management is phased out, native prairie deteriorates, and essential native nectar sources and grasses decrease. No future reintroduction of extirpated species would be considered.

Riparian and Native Woodlands

Riparian vegetation may develop along the Wild Rice River corridor and become more diverse between managed Refuge pools once fixed elevations are established. Native woodlands would not be managed; they may deteriorate over time or be self-supporting. Dependent migratory birds such as yellow warblers and Northern orioles would follow suit.

Physical Environment

Climate and Air Quality

A reduced impact would occur on air quality under this alternative as fewer fossil fuel burning engines would be needed under minimum management. This reduced impact is not likely to be measurable. Prescribed burning would be discontinued under this alternative, and air quality impacts would be reduced. However, eliminating prescribed fire would not eliminate fire from Complex lands. Wildfires would still burn Complex vegetation although the frequency of fires would be reduced. Fuel loading may yield larger and more intense fires and total air quality impacts may be the same as the other alternatives.

Soil and Water Quality

Some small improvement in soil loss due to wind and water erosion could be anticipated as well as increases in organic matter as cropland is seeded to grass under this alternative. The nutrient cycle that is triggered by fire and grazing disturbance would be infrequent.

Complex water quality would be expected to decline as watershed agricultural impacts continued.

Hydrology

Restoring wetlands to natural levels would result in a slight increase in flow in the Wild Rice River. No other impacts would be anticipated.

Cultural Resources

Cultural resources on the Complex would still be protected by law enforcement. No additional interpretative facilities or programs would be continued or developed. Existing interpretive displays and panels would not be maintained. No additional areas would be surveyed.

Socio-economic Environment

Recreational Resources - Public Use

All public use would be eliminated on the Refuge including hunting, fishing, and wildlife observation under this alternative. All facilities would be removed. Refuge roads would not be maintained. The Visitor Center would not be staffed. Waterfowl Production Areas would still be open to hunting, fishing, and trapping only. No new facilities or opportunities would be developed on the WPAs. Environmental education and outreach would cease on the Complex. Under this alternative, the Refuge would be closed to all visitors. As a result, demand for outdoor recreation would increase on other lands in the Complex.

The lost recreation opportunity would generate political pressure to restore these opportunities or transfer the management of the Refuge to another agency.

Economics

Under this alternative, the number of wildlife-dependent visits to the area would decrease dramatically. A corresponding decrease in the amount of money spent in the local communities on lodging, food, and supplies would be expected. Eliminating haying, farming, and grazing on the Complex would greatly reduce the economic benefit local producers gain from conducting Complex land management. The decrease in staff working at the Complex would reduce the amount of revenue in local communities generated by staff living in the area. Supplies and services purchased through local businesses would be reduced. Weed control conducted at levels required to meet legislative standards should ensure that the impact to adjacent landowners from Complex weeds does not increase.

Environmental Justice

Considering social and economic impacts, actions under this alternative are not known to cause disproportionately high and adverse human health impacts in any population and no such impacts would be expected to occur as a result of the Custodial alternative. No adverse or disproportionately high socioeconomic impacts to low-income or minority populations are expected to occur under this alternative.

Alternative B: No Action - Continue Current Management

Wildlife Habitat Fragmentation and Alteration

This alternative would help limit habitat fragmentation since opportunities to acquire, manage, or protect important wildlife habitat will be pursued. This effort would be opportunistic depending on Service project emphasis and available sources of funding. As a result, the Service may be able to capitalize on opportunities to acquire key habitat that would help to prevent fragmentation. A limited habitat management strategy would result in the slow, but inevitable, colonization of key habitats like native prairie by trees and nonnative plants. Upland habitats would become less attractive to grassland nesting birds as the vegetative structure and species diversity of Complex grasslands decline. An overall long-term decline of plant and animal species richness throughout the Complex would occur.

Grasslands and Tallgrass Prairie Habitats

At the current rate of habitat management, about 10 percent of the uplands on the Complex are actively managed annually. This management effort is not spread evenly throughout the Complex. Some grassland areas have never or very rarely been managed due to lack of time, money, or staff. Under this No Action alternative, these areas would continue to be left unmanaged and the deterioration of grassland quality and corresponding wildlife response described under the custodial alternative would occur.

Grasslands that are currently being managed would continue to be managed at the same rate with the same tools and methods. Under these management activities, some grassland habitat conditions would continue to decline while some would maintain their present condition; others, such as native prairie, would be adequately managed. If the current level of grassland habitat management on the Complex continues, the long-term overall grassland condition would decline. At the current staffing and funding levels, it is not possible to manage an adequate amount of habitat in a timely fashion. As a result, many of the Complex grasslands receive too much rest from disturbance. Attempts to diversify grassland stands would continue, but these efforts would be sporadic and inconsistent. Grassland nesting cover for migratory birds would not be maximized on the Refuge as some lands would be managed for crop production.

Under this alternative, weed control would continue to be conducted at levels required to meet legislative standards and new techniques would be explored. Weed control should ensure that the impact to adjacent landowners from Complex weeds does not increase.

Law enforcement would continue on all Complex lands and grassland easements to help prevent this resource from being hayed early, converted to cropland, or developed.

Wetlands

Wetlands managed under this alternative would not reach their full potential in productivity and wildlife use. Managing for stable water levels limits the extremes that wetlands go through during the natural drying and flooding cycles. These cycles produce the greatest vegetative diversity and biomass. Invertebrate productivity and wildlife use closely follows drying and flooding cycles. Large permanent wetlands created by artificially holding water for longer periods of time are less productive than wetlands under going drying and flooding cycles. Under natural conditions many of these wetlands would be semipermanent or seasonal in nature. Some water use information would be collected, but additional information that would complete the water use data needs would not be collected. Tewaukon and Sprague Lakes would be managed as open water rest areas for migratory birds. These lake levels would support carp populations (despite management) which will contribute to turbidity in these waters. These lake levels also cause more bank erosion than would be caused if they were managed at historic shallow levels. In the No Action alternative, non-managed wetlands would undergo natural cycles so they would not be affected.

Law enforcement efforts would continue on all Complex lands and wetland easements would be enforced.

It is likely that water quality on the Refuge would continue to decline because no efforts will be initiated to look at watershed impacts in the Wild Rice River drainage.

Native Grassland Migratory Birds

Over time, under the No Action alternative, waterfowl populations would decrease as the long-term health, density, and vigor of the Complex grasslands declined. Waterfowl nesting attempts would still be driven by area wetland conditions, but most of the Complex grasslands would become unattractive for nesting ducks as species composition and structure declined. Depending on funding and personnel, predator control would still be utilized on the Refuge to try and maintain waterfowl nesting success at or above population sustaining levels. If predator control efforts are sustained, waterfowl nest success should be adequate to maintain populations. The Complex wetlands would still provide good resting areas for migrating waterfowl, and croplands would provide a limited food source.

Use of grasslands on the Complex by migratory grassland nesting birds, such as the bobolink, grasshopper sparrow, upland sandpiper, etc., and prairie butterflies would decrease. Over the long-term, as the grasslands change to less diverse stands of nonnative grasses and grassland structure deteriorates, use by nesting grassland birds would decline. The invasion of more woody plants would also make Complex lands less attractive to grassland nesting birds as they avoid selecting nest sites adjacent to trees.

Other Migratory Birds

Wetland dependent migratory birds, such as yellow-headed blackbirds, herons, egrets, cormorants, shorebirds, marsh wrens and others, would not be measurably affected by this alternative. Managed wetlands would not reach the range of conditions (dry to full) that they would under the custodial or enhanced management alternatives. As a result, they would be less biologically productive over time. The plant biomass that develops as wetlands dry out which supports a large waterbird response when they refill, would not be as dramatic when wetlands are managed for more stable conditions. Less habitat would be available for shorebirds than when management regimes do not include long, draw down periods. Wetland migratory bird use would still be dependent on local and regional wetland conditions.

Species that are dependent on trees, such as yellow warblers, thrushes and Northern orioles, may be negatively affected by this alternative if native woodlands decline over time.

Resident Birds

Over time, under the No Action alternative, grassland nesting bird populations would decrease as the health, density, and vigor of the Complex grasslands declines.

The only native game bird that occasionally uses the Refuge is the sharp-tailed grouse. Grouse are not likely to be affected by this alternative and are likely to remain incidental on all Complex lands

Ring-necked pheasants would be expected to remain stable under this alternative. Managing habitat for pheasants generally consists of providing alternating blocks of grassland nesting cover, tree and shrub plantings for winter cover, and croplands for food sources. These habitat components would be retained under this alternative providing the same amount and types of habitat that are currently available. If upland conditions decline markedly over the long-term, nesting habitat would be less suitable and pheasant populations could slowly decline. Predator control would also benefit this species. Winter weather will still be the primary limiting factor that affects pheasant populations.

Managing Complex habitat to specifically benefit pheasants was identified by the public as an important issue during the CCP planning process. The public perception would be that Complex management will continue to support pheasant populations. Pheasant hunting would also be continued under this alternative which would be popular. Since pheasant populations would be supported by Refuge habitats and pheasant hunting would continue, political pressure to maintain more food plots and plant additional tree and shrub habitat for pheasants would be limited.

These impacts are not anticipated on District lands where hunting would still occur and cropping is only used for a few years to re-establish grassland cover.

Mammals

Deer are commonly found on Complex lands and are a popular game species that attract large numbers of visitors. Deer hunting will be continued under this alternative. Managing Refuge habitat to specifically benefit deer was identified by the public as an important issue during the CCP planning process.

Refuge deer numbers are likely to remain stable under this alternative. Croplands that provide winter food for deer would be maintained. Deer populations would be maintained at levels that habitat can support. Deer populations would be managed at levels that limit damage to surrounding crops and hay supplies which would limit political pressure to maintain additional food plots for deer.

These impacts are not anticipated on District lands where hunting would still occur and cropping is only used for a few years to reestablish grassland cover.

Some short-term seasonal reductions in the Refuge populations of small furbearers, such as skunk, raccoon, red fox, and mink, would be anticipated in the years when predator management would be instituted. These species quickly return to previous levels as young of the year animals from the surrounding area disburse.

It is likely that most other Complex mammal populations would not be affected by this alternative and remain stable.

Fish

Managing Complex wetlands to support recreational fishing was identified by the public as an important issue during the CCP planning process.

Managing Tewaukon and Sprague Lakes as open water migration rest areas would provide habitat capable of supporting recreational fisheries. The Lake Tewaukon aerator would be utilized to help prevent winter-kill. Size limits on predator fish and other management techniques would be utilized to attempt to reduce carp populations. While the reduction of other species, such as carp, may result in small improvement in water quality, agricultural runoff throughout the watershed has a much greater impact on water quality. It is likely that any water quality improvement caused by the reduction in carp numbers will not be measurable.

Managing Tewaukon and Sprague Lakes at current elevations would provide habitat that is likely to retain the recreational fish population in these lakes and support a popular recreational fishery. Sprague Lake would still be expected to winter-kill occasionally.

Sport fish populations would be managed at levels that support recreational fishing in two large lakes, which would limit political pressure to manage additional wetland fisheries.

No fisheries are established on District lands.

Reptiles and Amphibians

Little impacts to these populations are anticipated with this alternative.

Endangered and Threatened Species

Since the only endangered wildlife species component on Complex lands is migration habitat for bald eagles, no significant impact would occur under this alternative.

Western prairie fringed orchid populations on grassland easement tracts would still be monitored. Efforts will continue to protect prairie habitats that contain these species from being converted to cropland or other development through easement and fee acquisition. These efforts may not be enough to ensure self-sustaining stable populations.

Rare species and species of concern (wildlife and plant species) on District lands would be adversely affected over the long-term. The white lady's slipper, Dakota skipper, and the powesheik skipper populations on the Hartleben WPA would decline if habitat management is not adequate and native prairie deteriorates. Essential native plant nectar sources and grasses would be expected to decrease. Prairie butterfly populations would decrease as the native prairie areas are treated too infrequently. Attempts to convert grasslands to diverse native prairie plant communities would only be opportunistic and based on additional funds. Prairie dependent wildlife species would not increase.

No future reintroduction of extirpated species would be considered.

Riparian and Native Woodlands

Riparian vegetation would remain stable on the Complex and would not be affected by this alternative. Native woodlands would not be managed, they may deteriorate over time, or be self supporting. Dependent migratory birds, such as yellow warblers and Northern orioles, would follow suit.

Physical Environment

Climate and Air Quality

Similar types and amounts of management would occur in this alternative as currently occur, which should not change the impact on air quality by running fossil fuel burning engines. Prescribed burning would continue at rates similar to those that are currently being used. Some impacts to air quality could be anticipated from this management activity. Some of these impacts are mitigated by burn prescriptions that ensure smoke is carried aloft. Permits from the ND Health Department are applied for prior to prescribed burning done on the Complex to comply with ND Air Pollution Control Rules.

Soil and Water Quality

Some small amount of soil loss due to wind and water erosion would be anticipated on Refuge croplands. Managing Tewaukon and Sprague Lakes at higher levels would cause more bank erosion than would be caused if they were managed at historically shallow levels. Complex water quality would be expected to decline due to cumulative agricultural impacts throughout watersheds.

The nutrient cycle that is triggered by fire and grazing disturbance as a result of upland management efforts would be more frequent.

Hydrology

No impacts would be anticipated. Managed wetland water use data would be incomplete.

Cultural Resources

Cultural resources on the Complex would be protected. No additional interpretative facilities or programs would be continued or developed. No additional areas would be surveyed and no new data would be collected other than what would be incidentally gathered as a result of pre-construction surveys.

Socio-economic Environment

Recreational Resources - Public Use

Under this alternative, public use would continue on the Refuge at current levels including hunting, fishing, and wildlife observation. All facilities would be maintained and may be upgraded when special funding opportunities arise. Areas of the Refuge that are closed to public entry during certain times of the year to limit disturbance to migratory birds and resident wildlife would remain closed. Refuge roads and trails would be maintained. The Visitor Center would be staffed during the work week. Waterfowl Production Areas would still be open to hunting, fishing, and trapping. New facilities or opportunities would only be considered and developed on WPAs when special funding opportunities arise. No new opportunities or public use facilities associated with these activities would be developed. Environmental education and outreach would continue at current levels, but may fluctuate depending on staffing. Over the long-term, current staff may not be able to provide adequate visitor center hours, materials, or law enforcement. Wildlife observation visits would increase in the short-term but would decrease over time. As the diversity of wildlife and habitat decreased so would the public's interest in visiting the Complex. Law enforcement would continue at the same minimal level.

Maintaining recreational opportunities would limit political pressure to provide these opportunities or transfer the management of the Refuge to another agency.

Economics

Under this alternative, the number of visitors to the area would be expected to continue to increase over the long-term. A corresponding increase in the amount of money spent in the local communities on lodging, food, and supplies would be expected. Utilizing area producers to accomplish Complex upland management such as haying, farming, and grazing would continue to provide economic benefits for local producers. Weed control efforts would ensure that the impact to adjacent landowners from Complex weeds does not increase. These impacts should decrease over time as new more effective techniques are utilized.

A constant number of staff working at the Complex would maintain the amount of local revenue generated by staff living in the area and supplies and services purchased through the local community.

Environmental Justice

Considering social and economic impacts, actions under this alternative are not known to cause disproportionately high and adverse human health impacts in any population, and no such impacts would be expected to occur as a result of the No Action alternative. No adverse or disproportionately high socio-economic impacts to low-income or minority populations are expected to occur under this alternative.

Alternative C: The Proposed Action -Implement the CCP
Wildlife Habitat Fragmentation and Alteration

This alternative would help limit habitat fragmentation since opportunities to acquire, manage, or protect important wildlife habitats would be pursued. Habitat acquisition and protection efforts would focus on diverse native prairie sites that have high wetland densities or unique prairie characteristics. By emphasizing partnerships and utilizing matching sources of funding, the opportunity to protect and enhance habitat may be approached strategically. Large blocks of cover would be protected which would provide grassland nesting birds and other prairie species important habitat components needed to maintain self-sustaining populations. As a result, the Service may be able to capitalize on opportunities to acquire key habitat that would help to prevent fragmentation.

An enhanced habitat management strategy would be employed to limit colonization of key habitats like native prairie by trees and nonnative plants. Upland habitats would be managed to improve plant structure and diversity in order to improve this habitat for grassland nesting birds and other prairie dependent species like butterflies. Management would be utilized to improve the vegetative structure and species diversity of planted cover to benefit a greater diversity of wildlife species. An overall long-term improvement of plant and animal species richness throughout the Complex would be the result.

Grasslands and Tallgrass Prairie Habitats

Implementing the CCP under this alternative will improve protection, enhancement, and restoration of native plant communities on the Complex.

Preventing the conversion of the remaining 65,000 acres of native prairie on private land in the District is a high priority if much of the native flora and dependent fauna of the tallgrass prairie ecosystem is to be preserved for scientific study, genetic sources, and public enjoyment. Under this alternative, the Service, in cooperation with partners, would protect remaining native prairie tracts by purchasing fee title or easement interests or utilize any other forms of cooperative agreements with landowners that prevent prairie conversion. Currently, the Service has protected 10,400 acres of native prairie with grassland easements from willing sellers. An estimated 57,000 acres are targeted for protection in this alternative. Additional funding for the grassland easement program through grants and other sources, such as appropriated Land and Water Conservation funds, Ducks Unlimited, and Nature Conservancy funds, would need to be sought and secured. Enforcement of existing grassland easement interests would continue to be conducted to ensure that easement terms are met.

Enhancing Complex grasslands would include manipulations such as weed or nonnative species control, increasing the diversity of native plants (interseeding or fire management), or increasing the vegetative heights of the stands. Under the CCP, strategies control of nonnative species (i.e., leafy spurge, Canada thistle, Russian olives) would continue to be an important priority. A variety and combination of techniques (chemical, mechanical, and biological) would be used to reduce the density of these species in Complex grasslands. Reducing the density of nonnative species also reduces the competition for resources by native species. The amount of useable habitat available for native grassland birds, prairie butterflies, and ground nesting waterfowl would increase.

Implementation of the CCP will target restoring Complex planted grassland fields (DNC, nonnative, and warm season native plantings) to a more diverse native floral community. The objective of this management focus is to improve this habitat for a greater diversity of grassland nesting birds and other species. A total of 1,700 acres would be targeted over the next 15 years on the Complex. Diverse managed grasslands would provide a range of vegetative heights attractive to ground nesting birds like mallards, bobolinks, upland sandpipers, and northern harriers. Overall, wildlife species diversity supported by Complex grassland habitats should increase.

Planted cover that is not targeted for management designed to improve native vegetative diversity would be maintained with various techniques including prescribed burning, grazing, and mowing when appropriate.

Wetlands

Under this alternative, managed wetlands would reach their potential in productivity and wildlife use. Improved management would yield a range and variety of wet and dry stages and wetland vegetation response that mimics the productivity of natural cycles. These stages produce the greatest vegetative diversity and biomass. Invertebrate productivity and wildlife use closely follows drying and flooding cycles. Large permanent wetlands created by artificially holding water for longer periods of time do not have the productivity that wetlands undergoing drying and flooding cycles do. Tewaukon and Sprague Lakes would be managed as open water rest areas for migratory birds. These lake levels will support carp populations (despite management), which would contribute to turbidity in these waters. These lake levels also cause more bank erosion than would be caused if they were managed at historic shallow levels. In this alternative, non-managed wetlands would undergo natural cycles and fire frequency would increase which may improve nutrient cycles.

Law enforcement would continue on all Complex lands and wetland easements would be enforced to ensure that the real property interest purchased is maintained and that wetlands are not burned, drained, leveled, or filled. If partnerships within the Wild Rice River Watershed can be pursued successfully, water quality in the Wild Rice River should improve.

With the implementation of this alternative the protection of over 1800 acres of wetland habitat in the District would be accomplished using easements, fee title, and cooperative agreements.

Native Grassland Migratory Birds

Over time, under the enhanced management alternative the potential for waterfowl populations should increase as the long-term health, density, and vigor of the Complex grasslands improves. Waterfowl nesting attempts would still be driven by area wetland conditions. Over time, most of the Complex grasslands would become more attractive for nesting ducks. Predator control would be utilized on the Refuge to try and maintain waterfowl nesting success at or above population sustaining levels. If predator control efforts are sustained, waterfowl nest success should be adequate to maintain populations. The Complex wetlands would still provide good resting areas for migrating waterfowl and should provide food sources under improved water management. Croplands would provide a food source for migrating waterfowl.

Use of grasslands on the Complex by migratory grassland nesting birds, such as the bobolink, grasshopper sparrow, upland sandpiper, etc., and prairie butterflies should improve. Over the long-term, as grassland diversity and structure improves, use by nesting grassland birds would improve. The reduction of woody plants would also make Complex lands more attractive to grassland nesting birds as they avoid selecting nest sites adjacent to trees.

Other Migratory Birds

Wetland dependent migratory birds, such as yellow-headed blackbirds, herons, egrets, cormorants, shorebirds, marsh wrens, and others, would be positively affected by this alternative. Managed wetlands would undergo a wide range of conditions (dry to full). As a result, they would be more biologically productive over time. The plant biomass that develops as wetlands dry out would support a large waterbird response when they refill. More habitat would be available for shorebirds when management regimes include long draw down periods. Wetland migratory bird use would still be dependent on local and regional wetland conditions.

Resident Birds

Over time, under the enhanced management alternative, grassland nesting bird populations would increase as the health, density, and vigor of the Complex grasslands increases.

The only native game bird that occasionally uses the Refuge is the sharp-tailed grouse. Grouse are not likely to be affected by this alternative and are likely to remain incidental on all Refuge lands. Grassland easements should protect grassland habitats from conversion is the limiting factor for sharp-tailed grouse and prairie chickens on the Complex. These species should benefit from this alternative.

Ring-necked pheasants would be expected to remain stable under this alternative. Managing habitat for pheasants generally consists of providing alternating blocks of grassland nesting cover, tree and shrub plantings for winter cover, and croplands for food sources. Some of these habitat components would be retained under this alternative providing similar types of habitat to those that are currently available. If upland conditions improve markedly over the long-term, nesting habitat would be more suitable and pheasant populations may improve. Predator control would also benefit this species. Winter weather will still be the primary limiting factor that effects pheasant populations.

Managing Complex habitat to specifically benefit pheasants was identified by the public as an important issue during the CCP planning process. Complex habitats would continue to support pheasant populations. Pheasant hunting would also be continued under this alternative which would be popular.

These impacts are not anticipated on District lands where hunting would still occur and cropping is only used for a few years to reestablish grassland cover.

Mammals

Deer are commonly found on Complex lands and are a popular game species that attract large numbers of visitors. Deer hunting will be continued under this alternative. Managing Refuge habitat to specifically benefit deer was identified by the public as an important issue during the CCP planning process.

Refuge deer numbers are likely to remain stable under this alternative. Croplands that provide winter food for deer would be maintained. Deer populations would be maintained at levels that habitat can support. Deer populations would be managed at levels that limit damage to surrounding crops and hay supplies which would limit political pressure to maintain additional food plots for deer.

These impacts are not anticipated on District lands where hunting would still occur and cropping is only used for a few years to reestablish grassland cover.

Some short-term seasonal reductions in the Refuge and selected WPA populations of small furbearers, such as skunk, raccoon, red fox, and mink, would be anticipated in the years when predator management would be instituted. These species would quickly return to previous population levels as young of the year animals from the surrounding area disburse.

It is likely that most other Complex mammal populations would not be affected by this alternative and would remain stable.

Fish

Managing Complex wetlands to support recreational fishing was identified by the public as an important issue during the CCP planning process.

Managing Tewaukon and Sprague Lakes as open water migration rest areas would provide habitat capable of supporting recreational fisheries. The Lake Tewaukon aerator would be utilized to help prevent winter-kill. Size limits on predator fish and other management techniques would be utilized to attempt to reduce carp populations. While the reduction of other species, such as carp, may result in small improvement in water quality, agricultural runoff throughout the watershed has a much greater impact on water quality. It is likely that any water quality improvement caused by the reduction in carp numbers would not be measurable.

Managing Tewaukon and Sprague Lakes at current elevations would provide habitat that is likely to retain the recreational fish population in these lakes and support a popular recreational fishery. Sprague Lake would still be expected to winter-kill occasionally.

Sport fish populations would be managed at levels that support recreational fishing in two large lakes which would limit political pressure to manage additional wetland fisheries.

No fisheries are established on District lands.

Reptiles and Amphibians

Few impacts to these populations would be anticipated with this alternative. Surveying these populations would provide important baseline data on Complex populations.

Endangered and Threatened Species

Since the only endangered wildlife species component on Complex lands is migration habitat for bald eagles, no significant impact would occur under this alternative.

Western prairie fringed orchid populations on grassland easement tracts would still be monitored. Increased efforts would be made to continue to protect prairie habitats that contain these species from being converted to cropland or other development through easement and fee acquisition. These acquisitions should improve chances for this species to maintain self-sustaining stable populations.

Populations of rare species and species of concern (wildlife and plant species) on District lands would be positively affected over the long-term. The white lady's slipper, Dakota skipper, and the powesheik skipper populations on the Hartleben WPA would remain stable and may improve as habitat management techniques become more refined.

Native prairie health and vigor would improve, and essential native nectar sources and grasses would be perpetuated. Prairie butterfly populations would remain stable or increase. As the native prairie areas are treated, species composition should improve and competing nonnative vegetation should decrease. Attempts to convert planted grasslands to diverse native prairie plant communities would be strategically and systematically applied to the landscape. Prairie dependent species are expected to increase.

Reintroduction of extirpated species would be considered if habitat parameters are achieved.

Riparian and Native Woodlands

Riparian vegetation would remain stable on the Complex. Additional efforts would be made to identify, protect, and reestablish riparian habitats throughout the Complex which would support dependent migratory bird populations. Native woodlands would be evaluated and be managed to ensure they are self supporting. These woodlands should support dependent migratory birds such as yellow warblers, thrushes, and Northern orioles.

Physical Environment

Climate and Air Quality

Since increased levels of management would occur under this alternative, the impact on air quality by running fossil fuel burning engines would increase. Prescribed burning frequency would increase. Some negative impact to air quality could be anticipated from this management activity. Some of these impacts would be mitigated by burn prescriptions that ensure smoke is carried aloft. Permits from the ND Health Department are applied for prior to prescribed burning done on the Complex to comply with ND Air Pollution Control Rules.

Soil and Water Quality

Some small amount of soil loss due to wind and water erosion could be anticipated on Refuge croplands. Managing Tewaukon and Sprague Lakes at higher levels would cause more bank erosion than would be caused if they were managed at historic shallow levels. Complex water quality would be expected to improve if projects designed to evaluate and improve site specific sources of nutrients and sediments are implemented.

The nutrient cycle that is triggered by fire and grazing disturbance as a result of upland management efforts would be more frequent.

Hydrology

No significant impacts would be anticipated. Managed wetland water use data would be improved and Complex water sources may be more efficiently used as a result.

Cultural Resources

Cultural resources on the Complex would be protected. Additional interpretative and storage facilities would be developed. Additional areas would be surveyed and new data would be collected which would provide additional background information about Complex cultural resources.

Socio-economic Environment

Recreational Resources - Public Use

Under this alternative, public use, including hunting, fishing, and wildlife observation, would continue on the Refuge at current levels. Opportunities to expand fishing hours or hunting opportunities could be considered if staffing and funding are increased.

All existing facilities would be maintained and new educational and interpretive exhibits, trails and platforms, and brochures would be developed. The visitor center would be expanded and open for additional hours on weekends coinciding with peak visitation. Maps, bird lists, brochures, and a Complex web site would be improved and developed to provide visitors with additional information.

Waterfowl Production Areas would still be open to hunting, fishing, and trapping. Maps would be developed to provide Complex visitors with better information about WPAs.

The enhanced habitat management and protection objectives should increase the diverse and unique native fauna and flora which in turn should increase the number of visitors that are interested in wildlife observation and photography to areas with rare and unique species.

Increased visitor use, even if determined compatible, would have some negative impacts on habitat, plants, and wildlife species. These negative impacts would be avoided by utilizing stipulations that limit public use activities to certain areas, times, and locations during the year. Limits on boat and vehicle traffic on the Refuge during the fall and spring waterfowl migration periods would continue. Areas of the Refuge that are closed to public entry during certain times of the year to limit disturbance to migratory birds, nesting birds, and resident wildlife would remain closed.

Maintaining recreation opportunities would limit political pressure to provide these opportunities or transfer the management of the Refuge to another agency. Over the long-term, as outdoor recreation visits increase on the Complex, current staff may not be able to provide adequate visitor center hours or law enforcement.

Environmental education and outreach would continue at current levels, and would increase as staffing does. Outreach efforts would continue and increase with area schools, fairs, community events, wildlife clubs, State, and Federal congressional offices

Economics

Under this alternative, the number of visitors to the area would be expected to continue to increase over the long-term. A corresponding increase in the amount of money spent in the local communities on lodging, food, and supplies would be expected. Utilizing area producers to accomplish Complex upland management such as haying, farming, and grazing would continue to provide economic benefits for local producers. Weed control and grassland management conducted more intensively would ensure that the impact to adjacent landowners from Complex weeds does not increase. The impact from these species would decrease over time.

An increased number of staff working at the Complex would increase the amount of local revenue generated by staff living in the area. An increase in management activities would increase the amount of supplies and services required.

Environmental Justice

Considering social and economic impacts, actions under this alternative are not known to cause disproportionately high and adverse human health impacts in any population and no such impacts would be expected to occur as a result of the Enhanced Management alternative. No adverse or disproportionately high socio-economic impacts to low-income or minority populations are expected to occur under this alternative.

A summary of some of the environmental consequences under each alternative are listed in Table 1. Evaluation on environmental consequences were divided in to short-term (15 years) and long-term (greater than(>) 50 years).

Table 1. Summary of Environmental Consequences						
	Alternative A Custodial		**Alternative B Current Level of Management**		**Alternative C Implement the CCP**	
	15 years	>50 years	15 years	>50 years	15 years	>50 years
HABITAT:						
Grasslands						
Protection through acquisition	-	--	-	--	+	+ +
Management	-	--	-	--	+	+ +
Restoration	-	--	o	-	+	+ +
Nonnative plant control	o	-	-	-	+	+ +
Wetlands						
Protection through acquisition	-	--	-	--	+	+ +
Managed wetlands	+	+	o	-	+	+ +
Natural wetlands	o	o	o	o	+	+ +
Native Woodlands	o	-	o	o	+	o
Cropland for wildlife food	-	--	o	o	o	-
WILDLIFE:						
Waterfowl	-	--	o	-	+	+ +
Migratory Grassland Birds	-	-	-	--	+	+ +
Native Wildlife						
Deer	+	-	o	o	o	o
Prairie butterflies	-	-	o	-	+	+ +
Reptiles & Amphibians	o	o	o	o	+	+ +
Nonnative Wildlife	+	+ +	o	+	--	-
Endangered Species	o	-	o	o	+	+
Predator Control	--	--	o	o	+ +	+ +
RECREATION-PUBLIC USE:						
Refuge Sport Fisheries	--	--	o	o	+	+
Refuge Hunting	--	--	o	o	+	+
District Hunting	+	+ +	o	o	+	+
Interpretation	--	--	o	-	+	+ +
Wildlife Observation & Photography	--	--	o	-	+	+ +
Environmental Education	--	--	o	-	+	+
Public Outreach	--	--	o	-	+	+
Ecosystem Partners	--	--	o	-	+ +	+ +
AIR QUALITY:	-	--	o	o	o	o
WATER QUALITY:	-	--	-	--	+	+ +
CULTURAL RESOURCES:						
Protection	o	o	o	o	+	+
Interpretation	--	--	o	o	+	+
SOCIO-ECONOMIC:						
Tourist Revenue	--	--	o	o	+ +	+ +
Agriculture Revenue	--	--	o	o	+	o
Business Revenue	--	--	o	o	+ +	+ +

LEGEND:
+ + Large Increase
+ Moderate Increase
o No Change
- Moderate Decrease
-- Large Decrease

Consultation and Coordination

The planning team consisted of Tewaukon Complex staff, a representative from the ND Game and Fish Department, and the Regional Office Planning Branch. A review team was made up of a variety of people including biologists and scientists from the Fish and Wildlife Service Regional Office and U.S. Geological Services, nongovernmental organizations, and interested individuals.

Public input for the development of this environmental assessment and CCP was gathered on issues in the Complex at a series of five open houses and through written comments on an Issues Worksheet. The open houses provided participants an opportunity to learn about the Refuge and District purposes, mission and goals, and current management issues. People attending were provided the chance to speak with Service representatives and to share their comments and concerns about current management. Attendees were also asked to suggest ways they would like to see Complex management change.

Prior to the public meetings, the Complex staff discussed the planning process with local County commissioners, sportsmen's groups, and other interested groups and advertised in the local media. Information on the planning process was also displayed at local cafes and businesses frequented by community members.

The Tewaukon Complex staff received a number of comments from our meetings, Issues Worksheets, and verbal discussions. Most of the local comments dealt with very specific issues. Many of the issues documented by the core planning team and the public can be grouped by category and include:

Wildlife Habitat Fragmentation and Alteration

- Declining native prairie plant and grassland bird populations
- Waterfowl nesting habitat
- Habitat fragmentation
- Predator control
- Private land initiatives

Grassland and Tallgrass Prairie Habitats

- Tallgrass prairie protection and emphasis
- Management of Complex lands including weed control, haying, burning, water management

Wetland habitat

- Wetland protection and management
- Water quality and rights

Increased Public Use

- Expanded recreational opportunities including hunting, fishing, wildlife observation, and camping
- Farming on the Refuge, increasing and decreasing the acreage
- More management for resident wildlife (deer and pheasant)
- Need for more law enforcement

Public feedback was generally supportive of the majority of current Complex land and wildlife management practices and programs. Socio-economic concerns raised during the planning process include increased wetland drainage and flooding, commercial uses of Federal lands, use of eminent domain to acquire Service lands, Refuge Revenue sharing shortfalls as compared to assessed taxes, wildlife crop depredation, and vandalism and trespassing on the Complex.

During the course of the planning process, the review team made up of Service staff, scientists, and nongovernment partners have had access to information on objectives and alternatives being considered. Written and verbal comments have been exchanged. This Environmental Assessment (EA) is the first opportunity that these groups and the general public have had to review the entire planning effort. This EA is expected to be available to the public by July 2000. A 30-day comment period will be provided. A final CCP is expected to be released by October 1, 2000.

A mailing list of all persons that commented or requested notification is available in Appendix N.

Appendix G. Compatibility Determinations

Station Name: Tewaukon National Wildlife Refuge Complex
Date Established:

Tewaukon National Wildlife Refuge: June 26, 1945
Tewaukon Wetland Management District: August 1, 1958

Establishing and Acquisition Authorities: The Tewaukon National Wildlife Refuge, located in Sargent County in southeastern North Dakota, was originally established as an easement refuge by Executive Order No. 6910 on November 26, 1934. Tewaukon was then established as a Refuge under the authority of Public Land Order 286 on June 26, 1945; additional lands were added with the approval of the Migratory Bird Conservation commission, under the authority of the Migratory Bird Conservation Act.

Tewaukon Wetland Management District was authorized by Congress with the passage of Public Law 85-585 on August 1, 1958. The first tract of land acquired in the District was in 1961. Additional lands were added to the District under the authority of the Migratory Bird Hunting and Conservation Stamp Tax. The Tewaukon WMD is comprised of approximately of 105 Waterfowl Production Areas (WPA's) (over 14,000 acres), 35,000 acres of wetland easements, 10,400 acres of grassland easements, and 112 wetland and 45 acres of grassland in FmHA easements located in Richland, Ransom, and Sargent Counties, North Dakota. Enabling legislation includes: the Migratory Bird Hunting and Conservation Stamp Act (16 USC 718-718h, 48 Stat. 452), and the Wetlands Loan Act (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 provisions of the Migratory Bird Conservation Act (16 USC 715 et seq.; 45 Stat. 1222), as amended, and since August 1, 1958, (P.L. 85-585; 72 Stat. 486) for acquisition of "Waterfowl Production Areas."

Purpose(s) for which Established: For lands acquired under the Executive Order, dated April 24, 1943, the purpose of the acquisition is to reserve and set apart certain public lands for the use of the Department of the Interior as a refuge and breeding ground for migratory birds and other wildlife.

- For lands acquired under Public Land Order 286, dated June 26, 1945, the purpose of the acquisition is "... as a refuge and breeding ground for migratory birds and other wildlife..."
- For lands acquired under the Migratory Bird Conservation Act, 16 U.S.C. S 715d, as amended, the purpose of acquisition is "... for uses as an inviolate sanctuary, or for any other management purpose, for migratory birds." 16 U.S.C. S 715d (Migratory Bird Conservation Act)
- For District lands acquired under the Public Law 85-585, dated August 1, 1958, the purpose of the acquisition is to assure the continued availability of habitat capable of supporting migratory bird populations at desired levels.
- For lands acquired under the Migratory Bird Hunting and Conservation Stamp Tax, 16 U.S.C. S 718, as amended, for the purpose: " ... as Waterfowl Production Areas" subject to go ... all of the provisions of such Act [Migratory Bird Conservation Act] ... except the inviolate sanctuary provisions ... 11 16 U.S.C. S 718© (Migratory Bird Hunting and Conservation Stamp Tax).

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 fish, wildlife, and plant resources and their habitats within the United Sates for the benefit of present and future generations of Americans."

Description of Proposed Use: Wildlife Observation, Wildlife Photography, Interpretation and Environmental Education

Provide opportunities that support wildlife-dependent recreation, education, and outreach to the public. From general observations conducted in the Refuge visitor center and along Lake Tewaukon and Sprague Lake, it is estimated that over 20,000 visitors utilize Tewaukon National Wildlife Refuge annually for wildlife/wildland observation, photography, interpretation/education, picnicking, and hiking. The majority of the use is focused on the east side of County Road 12 which includes the visitor center, Lake Tewaukon, the Prairie Lake Auto Tour, several picnic areas, and a scenic overlook. The District has substantially less visitation for the above uses (300 visits). A recent addition of a prairie walking trail at the Hartleben WPA is expected to increase this use.

Interpretation and environmental education services are provided when staff are available and include talks or guided tours for groups such as school groups, scouts, 4-H clubs, and special groups. The public is invited to participate in Refuge open houses and other events throughout the year.

The Comprehensive Conservation Plan proposes to continue with the above uses and add the following to improve interpretation and access for visitors:

- Develop a wildlife observation platform and interpretive hiking trail.
- Improve visitor center availability to visitors with staff and expansion of hours of operation during times of high use.
- Improve and expand the visitor center displays and group presentation area.
- Develop new Refuge brochures and update old brochures to new Service standards.
- Develop a tallgrass prairie interpretive trail near the visitor center.
- Develop and maintain a web site for the Complex.

Availability of resources:
Currently, sufficient resources are available to continue the existing wildlife-dependent recreation. The additional items to be added from the Comprehensive Conservation Plan are tied to funding requests in the form of the attached RONS projects (Appendix J).

Anticipated impacts of the use:
Some disturbance to wildlife will occur in areas of the Refuge frequented by visitors. However, with limiting of areas open to public use and Refuge road closures at specific times of the year, these impacts can be lessened (See CCP Wildlife Disturbance Section). Monitoring of activities and their impacts and limiting the location and time of year for wildlife-dependent visits will maintain use at an acceptable level.

Justification:
Based upon biological impacts described in the CCP and in the Environmental Assessment, it is determined that wildlife observation, wildlife photography, interpretation, and environmental education within the Tewaukon Complex will not materially interfere with or detract from the purposes for which this Complex was established.

One of the secondary goals of the National Wildlife Refuge System is to provide opportunities for the public to develop an understanding and appreciation for wildlife when found compatible. The four uses are identified as priority public uses in the National Wildlife Refuge System Improvement Act of 1997 and will help meet that goal at the Tewaukon NWR Complex with only minimal conflicts with the wildlife conservation mission of the Refuge System.

Determination: Wildlife Observation, Wildlife Photography, Interpretation, and Environmental Education are compatible.

Stipulations necessary to ensure compatibility:
- During peak concentrations of migratory waterbirds, areas will be closed and access limited to minimize any wildlife disturbance**.**
- Monitor use, regulate access and maintain necessary facilities to prevent habitat degradation in high public use areas.
- Monitor levels of use and effects on wildlife.
- Implement additional educational and interpretive programs that discuss wildlife disturbance.

Description of proposed use: Recreational Fishing

Lake Tewaukon and Sprague Lake are utilized as open water rest areas for migratory birds. A secondary use is public sport fishing according to State and Federal Regulations. Year-round bank fishing is allowed with seasonally limited access and boat fishing from May 1 through September 30 to avoid conflicts with migratory bird use of the Lakes. Visitors participating in this use at the Refuge are estimated at 9,000 per year. Facilities available include five boat ramps (two are accessible), picnic areas, fishing docks, informational kiosks, parking areas, and rest room facilities. A kids fishing day is held in conjunction with the Tewaukon Field Day sponsored by the ND Extension Service. A fishing tournament is held each year by local sportsmen's groups with proceeds going towards Lake developments. The CCP does not propose any additional improvements beyond maintaining the existing use. The District Waterfowl Production Areas are legally open to fishing as per their establishing legislation and the Federal Code of Regulations.

Availability of resources:

Currently, sufficient resources are available to continue the existing recreational fishing.

Anticipated impacts of the use:

Fishing and other human activities cause disturbance to wildlife (see CCP Section on Wildlife Disturbance). Impacts could occur during waterbird nesting season. However, the physical characteristics of these lakes and their shorelines make them poor areas for breeding waterbird populations.

Justification:

When Refuge and flowage easements were secured in the 1930's, it was with the understanding that recreational fishing use of the lake would be continued and improved. Recreational fishing, on Lake Tewaukon and Sprague Lake, causes minimal disturbances for waterbirds and benefits other wildlife species.

Based upon biological impacts described in the CCP and in the Environmental Assessment, it is determined that recreational fishing within the Tewaukon Complex will not materially interfere with or detract from the purposes for which this Complex was established.

One of the secondary goals of the National Wildlife Refuge System is to provide opportunities for public fishing when compatible, and it is identified as a priority public use in the National Wildlife Refuge System Improvement Act of 1997. Recreational fishing at the Tewaukon NWR Complex will support this goal with only minimal conflicts with the wildlife conservation mission of the Refuge System.

Determination: Recreational fishing is compatible.

Stipulations necessary to ensure compatibility:

- Both lakes will be closed to boat fishing and open to limited bank fishing during the spring and fall migrations periods for waterbirds.
- Parking lot, road, trail, and related access facilities will be maintained as necessary to prevent erosion or habitat damage.
- No additional lakes or marshes on the Refuge will be open to fishing.
- Boat use will be limited to recreational fishing (no jet skis, power boating, etc.,).
- Limit access for ice fishing to established areas (boat ramps and normal County and township roads).
- Waterfowl production areas will maintain only natural fish populations (no stocking).
- Monitor existing use to ensure that facilities are adequate and disturbance to wildlife continues to be minimal.

Description of proposed use: Recreational Hunting

Tewaukon National Wildlife Refuge is open to pheasant hunting and white-tailed deer hunting in the fall. Visitation for these activities is estimated at 4,000. Parking areas are made available for this use. The District Waterfowl Production Areas are legally open to hunting as per their establishing legislation and the Federal Code of Regulations. The CCP does not propose any additional improvements beyond maintaining the existing use.

Availability of resources:

Currently, sufficient resources are available to continue the existing recreational hunting.

Anticipated impacts of the use:

Recreational hunting will remove individual animals from the wildlife populations ensuring that carrying capacity is not exceeded (possibly impacting other species habitat). Some wildlife disturbance will occur during the hunting season.

Justification:

Hunting is a legitimate wildlife management tool that is used to manage deer populations. This is necessary to ensure that populations above the carrying capacity are controlled to reduce impacts to habitat and other wildlife that also depend upon that habitat. Some wildlife disturbance will occur during the hunting seasons. Proper zoning, regulations, and Refuge seasons will be designated to minimize any negative impact to wildlife populations using the Refuge. Based upon biological impacts presented in the CCP and in the Environmental Assessment, it is determined that recreational hunting within the Tewaukon Complex will not materially interfere with or detract from the purposes for which this Complex was established.

One of the secondary goals of the National Wildlife Refuge System is to provide opportunities for public hunting when it is found to be compatible, and it is identified as a priority public use in the National Wildlife Refuge System Improvement Act of 1997. Recreational pheasant hunting on the Tewaukon NWR Complex will support this goal, with only minimal conflicts with the wildlife conservation mission of the Refuge System and purposes of the Refuge.

Determination: Recreational hunting is compatible.

Stipulations necessary to ensure compatibility:

- Use of nontoxic shot is required on the Refuge for pheasant hunting and the District for waterfowl hunting and upland game hunting to minimize exposure to lead by waterfowl.
- Hunting must be in accordance with Federal and State regulations (seasons predominately open after migrating waterbirds have left the Complex).
- Hunting on Tewaukon NWR will take place in a manner that will minimize disturbance to migrating waterbirds.
- Hunting will be evaluated to provide a safe hunt (reduce the conflict of the variety of hunting seasons).
- The Refuge deer hunt will be coordinated with the ND Game and Fish Department to determine number of permits to manage the populations.
- Monitor these uses to assure they do not interfere with and are compatible with other wildlife-dependent recreational activities.

Description of proposed use: Trapping

Provide for trapping on the Tewaukon National Wildlife Refuge and on District lands. Trapping includes recreational fall trapping and spring predator trapping. Provide for recreational trapping in the fall and winter on the Refuge. Provide for spring predator trapping to improve upland nesting bird success on the Complex. The District Waterfowl Production Areas are legally open to trapping according to State regulations as per their establishing legislation and the Federal Code of Regulations.

Availability of resources:

Currently, insufficient funding and staffing exists to manage the recreational trapping and spring predator trapping on the Complex. Trapping funding requests are described in the Comprehensive Conservation Plan as Refuge Operation Needs System (RONS) projects (Appendix J). The Refuge recreational trapping would require additional management staff to administer the program (manager listed in RONS Project 1) and the spring predator trapping requires staff, funding of contracted trapper, monitoring of predator populations, and upland bird production (RONS Projects 12 and 2).

Anticipated impacts of the use:

Trapping removes individual animals from wildlife populations, and predator populations are temporarily reduced up to and during the nesting season. Spring predator trapping allows for the increased nesting success of upland nesting birds. Direct mortality would occur of target animals, some vegetation trampling by personnel, and some minor increase in general wildlife disturbance in trapping areas due to human and vehicular traffic. The possibility of injury exists to nontarget wildlife that are caught in traps such as badgers, weasels, an occasional rabbit, domestic dogs, and feral cats.

Justification:

Recreational trapping removes excessive wildlife populations and provides public recreational opportunity. Spring predator trapping will benefit upland nesting birds, including many species of waterfowl, when predator populations are reduced during the nesting season. Long-term negative effects to these predator populations will not take place as conducted trapping activities cannot feasiblely remove enough animals to permanently impact these populations. An environmental assessment of trapping is available at the Refuge office for review (U.S. Fish and Wildlife Service 1994).

Determination: Trapping is compatible with additional funding.

Stipulations necessary to ensure compatibility:

- Trapping will be conducted in a manner that will remove only targeted upland nest predators.
- Recreational trapping will occur within regular State seasons and will not conflict with other public uses.
- Trapping for predators outside of the regular season will be coordinated with the ND Game and Fish Department.
- Detailed trapping records will be maintained for Refuge trappers, staff trappers, and contracted trappers.
- No trapping will take place in areas of high public use especially surrounding Lake Tewaukon and Sprague Lake.
- No exposed bait would be placed near traps that might attract eagles or other raptors.
- Traps used will be legal traps as per the State of North Dakota and snares for specialize spring trapping.
- Traps must be checked at least once every 24 hours.
- Monitoring of nest success in areas targeted for predator removal to determine effectiveness and need for next years trapping (only when nest success falls below 30 percent Mayfield will trapping be conducted - see section on Waterfowl in CCP).

Description of proposed use: Management Tools with Economic Uses: Farming, Grazing, Haying

Continue upland management activities that are conducted under permit by private individuals such as haying, grazing, and farming. Currently, these economic uses are used as management tools to manage habitat for wildlife. Up to 500 acres are farmed each year in the Complex including Refuge fields and food plots on WPA's. Cattle grazing is currently used as a management tool on the Gainor WPA (about 800 acres) and sheep grazing is used on the Refuge and District to control leafy spurge (about 200 acres). Haying is used on the Refuge and District to improve grassland conditions with approximately 450 acres hayed per year by cooperators. The CCP proposes to maintain the number of crop acres and may include increasing grazing and haying if these tools are required for improving habitat. Projects in the CCP will improve the administrative and monitoring aspects of these programs.

Availability of resources:

Current resources are stretched thin to maintain existing programs. If additional staff support was available, these programs could be expanded to utilize these tools more effectively and monitoring could be accomplished. RONS Project Number 1, listed in Appendix J, would accomplish the goals of the CCP and improve the existing program.

Anticipated impacts of the use:

Current management affects approximately 10 percent of the upland habitat annually. This would increase to approximately 15 percent under the CCP. This management is not evenly distributed over the entire Complex, and the percentage of upland receiving optimum management is considered to be much less that 10 percent. General habitat conditions on the Complex would gradually deteriorate due to long periods of non-prescribed rest. While some wildlife disturbance does occur with these activities, the benefits to wildlife far outweigh these disturbances. No cultural resources would be impacted. No impact to endangered species should occur; however, habitat suitability for the Dakota skipper, regal fritillary, and white lady's slipper would continue to deteriorate without some form of defoliation treatment.

Justification:

Upland habitat conditions would deteriorate without the use of a full range of upland management tools. Exotic and noxious weed species would increase, and habitat diversity would decrease causing a decline in wildlife diversity. Migratory bird production and diversity would decrease as habitat suitability for these species declined. Consumptive and non-consumptive wildlife oriented recreational opportunities would decline as wildlife diversity and populations decreased. Although the prescribed management techniques listed in the proposed use are not adequate in scope to prevent such declines from taking place in all upland habitat sites, the limited upland management which does take place will diversify and improve treated grasslands. An environmental assessment that evaluates upland habitat management (including these uses) is available at the Refuge office for review (U.S. Fish and Wildlife Service 1994).

Determination: Farming, Grazing, Haying are compatible when used as management tools.

Stipulations necessary to ensure compatibility:

- General and special conditions are required for each permit to ensure consistency with management objectives.
- Farming permittees are restricted to a list of approved chemicals which are less detrimental to wildlife, use only necessary amount to control problem spots, and report their use yearly.
- Farming permittees must leave a portion of the crop for wildlife use.
- Farming permittees must not cut or plow under clover until after July 15 and alfalfa after July 1.
- Farming permittees must obtain permission from the Refuge Manager to work in the fields after opening of waterfowl season.
- Grazing permittees will be restricted to after June 1 to avoid some disturbance to nesting birds.
- Cattle grazing permittees are required to follow a short-term rotational grazing system to provide appropriate stimulation of grasses.
- Grazing permittees must comply with State Livestock Health Laws.
- Haying will be restricted to after July 15 to avoid disturbance to nesting birds.
- Haying permittees are required to report and mow noxious weeds in their areas.

Signatures:

Project Leader:

_____ _____

Sandra M. Siekaniec — Date
Tewaukon National Wildlife Refuge Complex

Concurrence:

_____ _____

Refuge Supervisor — Date

_____ _____

Assistant Regional Director, Refuges and Wildlife — Date

Appendix H. ND/SD Draft Ecosystem Goals and Objectives

Grassland Habitat Goals and Objectives

Mission: Protect, restore, and maintain North and South Dakota's native prairie and other grasslands to ensure its diversity and abundance of native flora and fauna.

Goal A: Prevent degradation and conversion of native prairie grassland to other uses.

Objectives:

- Locate, categorize, evaluate, and map existing native grassland within the Dakotas for baseline information within the next five years.
- Protect grasslands by easement on 50,000 acres of grassland per year for the next 10 years.
- By the year 2003, develop and implement public education programs to promote awareness and advocacy for native prairie.
- Maintain and develop partnerships to protect 10,000 acres native prairie over the next 10 years.

Goal B: Establish and maintain a network of large prairie grassland including native and planted grasslands on public and private lands.

Objectives:

- Promote and implement prescribed burning and rotational grazing on a minimum of 20 percent of private lands to enhance and maintain healthy native prairie.
- By the year 2003, develop a public education program on types of defoliation and importance of proper defoliation of native prairie.
- Over the next 10 years, develop partnerships to enhance and manage native prairie, including invasion by alien species.
- Develop criteria within six months and identify within the next five years the most biologically significant landscape to meet the needs of trust species and species of special concern.
- Develop criteria and treat a minimum of 20 percent of agency-owned grasslands annually.

Goal C: Reduce fragmentation effects to flora and fauna in native prairie communities. Maintain and develop corridors between large prairie conservation reserves to facilitate dispersion of native species and enhance gene flow.

Objectives:

- Develop an education program by the year 2003 to help the public understand why corridors are important.
- By 2003, develop management plans for these corridors to ensure they are properly managed to maintain the health and vigor of the plants.
- By 2003, develop statewide plans to determine where corridors are needed to connect blocks of native prairie.
- Develop and maintain corridors between large grassland landscape within five years of identification to reduce fragmentation. In addition, create public support for seeding native grasses and forbs along road rights-of-way.
- Use road rights-of-way, where applicable, to develop corridors by planting native grasses and forbs.
- Seek other avenues to develop, retain, and enhance corridors where road rights-of-way will not be sufficient.
- Over the next 10 years, maintain and develop statewide partnership programs to get people involved in identifying methods and locations for corridors, and their management.

Goal D: Protect, restore, and enhance trust species and species of special concern.

Objectives:

- Identify what species are in trouble and why by the year 2003.
- Develop at least three management approaches within the next 10 years for each species not covered at the landscape level.
- Develop education programs of why these species are important to conserve, what approaches will be taken for their recovery, and what the public can do to help.
- Develop statewide partnership programs to get people involved in species recovery.

Goal E: Maintain and increase planted grasslands.

Objectives:

- Within the next two years, identify the key areas to maintain and to increase planted grasslands.
- By 2003, develop a plan to connect the different corridors.

Goal F: Protect native prairie from industrial/chemical contamination.

Objectives:

- Identify what contaminants are entering native prairie and what adverse impact each contaminant may have on native prairie.
- Develop a plan on how to prevent and/or reduce further contaminants from entering native prairie.
- Develop a public education program explaining what contaminants are out there, what impact they are having, how to reduce or eliminate these, and how the public can help.

Wetlands and Watershed Goals and Objectives

Mission: Protect, restore, manage, and create wetlands and their watersheds in North Dakota and South Dakota to ensure the abundances of fish and wildlife species for the benefit of the American public.

Goal A: Increase recognition of wetland values by the various publics (community, conservation, communication, Congressional, and corporate entities) and develop a wetland advocacy.

Objective:

- Over the next three years, implement informational and educational opportunities that develop advocates for wetland conservation.

Goal B: Prevent or reduce the conversion or degradation of wetland habitats, and restore, replace, and enhance wetland habitats, qualities, and functions for trust species and species of concern.

Objectives:

- Annually protect 10,000 acres of wetlands, and 20,000 acres of uplands through fee, easement, and PFFW agreements for the next 10 years in North Dakota.
- Assist partners and other agencies in protecting, creating, restoring, managing, and enhancing 5,000 acres of wetlands and associated uplands annually in North Dakota.
- Develop partnerships with neighbors and local conservation organizations to annually manage 20 percent of Service uplands for trust species and species of concern.
- On a statewide (ND) basis, assure that easement violations are brought to conclusion within a one year period.
- Over the next 10 years, prepare easement maps for all North Dakota wetland easements.

Goal C: Maintain and restore the quality and health of existing prairie wetlands in order to preserve their natural productivity, longevity, and function.

(Objectives 1 and 2, Goal B, support this)

Goal D: Protect the water supply and property interests of wetlands on Service lands or easements.

Objective:

- File for water rights on eligible Service properties or easements over the next 10 years.

Riparian Goals and Objectives

Mission: Maintain, restore, and enhance riparian, floodplain, and watershed functions to river systems for the benefit of trust resources, Fish and Wildlife Service properties, and the American public.

Goal 1: Reduce the conversion of riparian habitats.

Objectives:

- Inventory and determine the quality of riparian habitats within North and South Dakota which influence National Wildlife Refuges by 2003 to provide baseline information.
- Implement a public education program in North and South Dakota by 2003 to promote a public appreciation and understanding for the benefits of and the threats to riparian habitats.

Goal 2: Maintain, restore, or enhance riparian habitats, quality, functions, and biotic communities.

Objectives:

- Use existing programs and opportunities in North and South Dakota by 2008 to provide river buffer zones on 10 percent of the 2 to 5 year floodplain 50 miles upstream of National Wildlife Refuges.
- Facilitate the location and control of all purple loosestrife populations upstream of national wildlife refuges in North and South Dakota by 2003 to maintain quality habitat.
- Use existing programs and opportunities in North and South Dakota by 2003 to restore or enhance the functions of oxbow wetlands within 50 miles of national wildlife refuges.
- National wildlife refuges with river impoundments in North and South Dakota shall collect water quality and biotic community data from inflows, outflows, and impoundment pools to determine baseline parameters by the year 2003.
- Support State efforts to monitor water quality and biotic communities in impaired waters in North and South Dakota to promote compliance with State water quality standards.
- Conserve, restore, and enhance aquatic systems and fish populations in North and South Dakota to provide increased recreational opportunities by increasing fishing access, education and outreach, and partnership opportunities by 2003.

Goal 3: Conserve and recover endangered, threatened, and species of special concern.

Objectives:

- Inventory endangered, threatened, and species of special concern along riparian corridors in North and South Dakota by 2001 to provide baseline information.
- Develop strategies for conserving and recovering endangered, threatened, and species of special concern along riparian habitat in North and South Dakota by 2003 to prevent any species from becoming listed.

Goal 4: Conserve, restore, enhance and create habitat resources in watersheds that influence the quality and quantity of water flowing into rivers and streams.

Objectives:

- Use existing oversight, coordination, and technical assistance to promote sound watershed management on an additional 10,000 acres in North and South Dakota by 2003.
- Use existing programs and opportunities in North and South Dakota by 2003 to conserve, enhance, or restore grasslands and wetlands in the immediate vicinity of national wildlife refuges to provide quality water runoff.

Missouri River Goals and Objectives

Goal 1: Reestablish the natural form and function and prevent degradation for prioritized riverine sections.

Objectives:

- Achieve a more ecologically beneficial hydrograph below Ft. Peck, Garrison, Ft. Randall, and Gavins Point Dams by working with COE, States, and other stakeholders by 2000.
- Work with the COE, States, and stakeholders to achieve compatible ecologically beneficial water quality parameters including temperature, sediment transport, and turbidity by 2003.
- Work with local zoning authorities and regulators to develop and implement policies that influence floodplain development and bank stabilization to maintain/restore river functions by 2003.
- Increase functional habitat base in prioritized riverine sections through restorations, creations, and modification/enhancement where opportunities allow. Attempt one major project per year beginning in 1999.
- Continue an environmental contaminants presence on the Missouri River that monitors conditions, identifies issues and problem areas, and develops strategies for rehabilitation.
- Promote restoration of river functions and values through proactive outreach.

Goal 2: Conserve and recover endangered, threatened, and species of special concern in riverine and impounded reaches.

Objectives:

- Augment current pallid sturgeon populations in: 1) Missouri and Yellowstone Rivers above Lake Sakakawea, and 2) below Ft. Randall through hatchery production to develop a genetically sound natural population structure by 2004.
- Achieve a 5-year average fledged success rate of 0.79 for 325 pairs of least terns, and 1.44 for 350 pairs of piping plovers below Garrison and Gavins Point Dams by 2004.
- Develop recovery actions or conservation plans for the sicklefin chub and the sturgeon chub by 1999, and seek funding and implementation of plans by 2000.
- Establish priority and complete status reviews for species of special concern, such as the blue sucker, flathead chub, western silvery and plains minnows, initiating one species per year beginning in 1999.

Goal 3: Fulfill commitments for mitigation of fishery resources brought about by construction of the mainstem dams.

Objectives:

- Through hatcheries, management, and conservation, support State fisheries objectives for the Missouri River and its impoundments annually.

Appendix I. Existing Partnerships

Tewaukon Complex works with a variety of organizations and individuals on natural resource projects such as the following:

Drift Prairie Wetland Enhancement North American Wetland Conservation Act Grant cooperators:

- ✓ North American Wetlands Conservation Council
- ✓ ND Game and Fish Department
- ✓ Ducks Unlimited
- ✓ The Nature Conservancy
- ✓ North Dakota Wetlands Trust
- ✓ Delta Waterfowl Foundation
- ✓ Barnes County Wildlife Federation
- ✓ Cass County Wildlife Club
- ✓ private landowners

North Dakota Jr. Duck Stamp Contest contributors:

- ✓ Cogswell Gun Club
- ✓ Tewaukon Rod and Gun Club
- ✓ Red River Sportsmen's Club
- ✓ Hannaford Conservation and Wildlife
- ✓ Rutland Sportsmens Club
- ✓ Barnes County Wildlife Federation
- ✓ American Foundation for Wildlife
- ✓ ND Chapter of The Wildlife Society
- ✓ Richland County Wildlife
- ✓ Cass County Wildlife Club
- ✓ United Sportsmen of Jamestown
- ✓ Falkirk Mining Company
- ✓ Lake Region Improvement Club
- ✓ Bottineau County Wildlife Federation
- ✓ Dakota Territory Gun Collectors

Fishery Habitat Improvement:

- ✓ ND Game and Fish Department
- ✓ Tewaukon Rod and Gun Club
- ✓ Cogswell Gun Club
- ✓ Rutland Sportsmens Club

U.S. Department of Agriculture:

- ✓ Natural Resources Conservation Service - easements, EQUIP, and CRP programs
- ✓ Farm Service Agency - easement program
- ✓ APHIS-depredation program
- ✓ biological weed control

U.S. Bureau of Reclamation:

- ✓ Kraft Slough Acquisition and Management

ND Game and Fish Department:

- ✓ wildlife surveys, habitat management, wildlife law enforcement

Partners For Wildlife program:

- ✓ private landowners

Sargent County Extension Service:

- ✓ youth programs, community projects

Water Quality Monitoring:

- ✓ Sisseton-Wahpeton Sioux Tribe
- ✓ North Dakota Department of Health
- ✓ Wild Rice Conservation District

Adopt-A-WPA:

- ✓ Sargent County Pheasants Forever
- ✓ Red River Sportsmen's Club

Annual Tewaukon Fishing Derby and projects:

- ✓ Cogswell Gun Club
- ✓ Tewaukon Rod and Gun Club

Other cooperators and projects include: local law enforcement agencies; The Wahpeton Zoo, conservation districts (no-till drill, native seed harvest); Ducks Unlimited (water control structures, predator fences); The North Dakota Wetlands Trust (grassland easements, water control structure repair); The Delta Waterfowl Foundation (predator research); Rural Fire Districts (wildfire suppression on- and off-Refuge); various universities (research); and the General Federation of Women's Cultura Club of Hankinson (native prairie restoration, walks, and nature trail).

Appendix J. RONS and MMS Project Worksheets

1 **Tewaukon NWR** *62660*

HABITAT RESTORATION Upland Restoration

MEASURES: 1500 refuge acres will be restored; 100 off-refuge acres will be restored

Also includes work on Also includes work on Tewaukon WMD - outputs off refuge are for the district

Many grassland fields on the Refuge and District have deteriorated to monotypic stands of exotic smooth brome and Kentucky bluegrass which provide little benefit for nesting grassland species including declining native grassland migratory birds, waterfowl, and butterflies. To improve nesting cover and maintain nesting success will require habitat management. This project would involve management of these areas including haying, burning, grazing, chemical treatments, interseeding, and weed management (including biological control). Use of cooperators can accomplish haying, seeding, and some weed management.

ADDITIONAL FUNDS NEEDED ($000):

	One-Time	Recurring Base	First Year Need
Construction Costs.....			
Operations: Personnel Costs.....	35	80	
Equipment Cost.....	40		
Facility Cost.....	4		
Services/Supplies.....	25	15	
Miscellaneous Costs.....	5	5	
TOTAL Operations Cost.....	109	100	209

ADDITIONAL PERMANENT STAFF NEEDED:

	FTEs	Cost ($000)
Managers.....	1.0	$58
Biologists.....		$0
Resource Specialists.....		$0
Education/Recreation Staff.....		$0
Law Enforcement.....		$0
Clerical/Administrative.....		$0
Maintenance/Equipment Operation.....	0.5	$22
TOTAL FTEs Needed.....	1.5	$80

EMPHASIS: 0% Critical health & safety - deferred maintenance; 0% Critical health & safety - capital improvement; 0% Critical resource protection - deferred maintenance; 0% Critical resource protection - capital improvement; 0% Critical mission - deferred maintenance; 0% Compliance & other deferred maintenance; 0% Other capital improvements

OUTCOMES*:	ES	WF	OMB	HEC	IAF	SDA	RW	PED	FAR	PRC	TOT
		60	20	10			10				100

PLANNING LINKS: Station Goal/Objective; FWS Ecosystem Goal/Plan; Station Step-down Mgmt Plan

CCP Draft: Refuge Habitat Objective to maintain 80% of DNC fields with 7.87 inches visual obscurity for optimal nesting habitat for ground nesting birds. District Habitat Objective to maintain 30% of DNC fields in high management WPAs & 10% of DNC in moderate management WPAs with 7.87 inches visual obscurity. Refuge Master Plan and Upland Management Plan objectives provide for optimum nesting habitat for ducks. Increasing the vegetative diversity and structure will make the fields more attractive to waterfowl and native grassland birds as nesting cover and provide better protection from mammalian and aerial predators.

PROJECT #: .....97020..... **RANK - STATION:** .....1..... **DISTRICT:** ...091... **REGION:** ...171... **NATIONAL:**

2 **Tewaukon NWR** *62660*

MONITORING & STUDIES Surveys & Censuses

MEASURES: 10 wildlife surveys will be conducted; 2 habitat surveys will be conducted; 15 % of survey will be off-refuge

Also includes work on Tewaukon WMD - outputs off refuge are for the district

Conduct essential data gathering & analysis to enable sound management on Tewaukon NWR & WMD. Flora & fauna inventories in the tallgrass prairie ecosystem will result in basic distribution & relative frequencies of occurrence of plants & animals on these areas. Information will be collected on migratory & resident birds, mammals, reptiles, amphibians, & fish. This information is critical for development of Comprehensive Conservation Plan, step-down plans & Prairie Pothole Joint Venture. This will allow evaluation of mgmt. practices on native flora & fauna of the tall grass prairie & identify opportunities to preserve & enhance declining, rare, & unique flora & fauna on Service land. The tallgrass prairie ecosystem has less than 1% of its original land base & as a result grassland nesting birds & other species are declining.

ADDITIONAL FUNDS NEEDED ($000):

	One-Time	Recurring Base	First Year Need
Construction Costs.....			
Operations: Personnel Costs.....	35	88	
Equipment Cost.....	40		
Facility Cost.....	4		
Services/Supplies.....	7	10	
Miscellaneous Costs.....	35	35	
TOTAL Operations Cost.....	121	133	254

ADDITIONAL PERMANENT STAFF NEEDED:

	FTEs	Cost ($000)
Managers.....		$0
Biologists.....	2.0	$88
Resource Specialists.....		$0
Education/Recreation Staff.....		$0
Law Enforcement.....		$0
Clerical/Administrative.....		$0
Maintenance/Equipment Operation.....		$0
TOTAL FTEs Needed.....	2.0	$88

EMPHASIS: 0% Critical health & safety - deferred maintenance; 0% Critical health & safety - capital improvement; 0% Critical resource protection - deferred maintenance; 0% Critical resource protection - capital improvement; 0% Critical mission - deferred maintenance; 0% Compliance & other deferred maintenance; 0% Other capital improvements

OUTCOMES*:	ES	WF	OMB	HEC	IAF	SDA	RW	PED	FAR	PRC	TOT
	5	30	40	25							100

PLANNING LINKS: Station Goal/Objective; Station Step-down Mgmt Plan; Legal Mandate; FWS Ecosystem Goal/Plan

CCP Draft links to all Refuge and District habitat and wildlife objectives (47). Project is necessary to provide a baseline for Service monitoring and evaluation to identify rare and endangered species, species of special concern, and to be able to evaluate management activities implemented through approved management plans for adaptive management.

PROJECT #: 97005 **RANK - STATION:** 2 **DISTRICT:** 046 **REGION:** 067 **NATIONAL:**

3 **Tewaukon NWR** *62660*

HABITAT MANAGEMENT Pest Plant Control

MEASURES: 5000 acres will be treated; 5000 acres infested by target species; 3000 acres will be treated chemically; 1000 acres will be treated mechanically; 1000 acres will be treated biologically

Also includes work on Tewaukon WMD

Much of our native prairie and grasslands are becoming invaded by noxious plants like leafy spurge, Canada thistle, purple loosestrife & Russian Olive trees. If the plants aren't controlled, they will spread. This will make their eradication more costly and reduce diversity of the vegetative and animal communities. These plants are currently increasing despite current efforts. Also several new species have invaded areas including musk thistle and bull thistle. It is also critical to our public support to manage our weeds effectively. Purchase chemicals & biological control agents to control leafy spurge, Canada thistle, purple loosestrife & Russian Olive trees. Mechanically remove treated trees. Work with sheep grazers to cooperatively graze spurge infested areas.

ADDITIONAL FUNDS NEEDED ($000):

	One-Time	Recurring Base	First Year Need
Construction Costs.....			
Operations: Personnel Costs.....	5	40	
Equipment Cost.....	30		
Facility Cost.....	3		
Services/Supplies.....	15	15	
Miscellaneous Costs.....	5	5	
TOTAL Operations Cost.....	58	60	118

ADDITIONAL PERMANENT STAFF NEEDED:

	FTEs	Cost ($000)
Managers.....		$0
Biologists.....		$0
Resource Specialists.....		$0
Education/Recreation Staff.....		$0
Law Enforcement.....		$0
Clerical/Administrative.....		$0
Maintenance/Equipment Operation.....	1.0	$40
TOTAL FTEs Needed.....	1.0	$40

EMPHASIS: 0% Critical health & safety - deferred maintenance; 0% Critical health & safety - capital improvement; 0% Critical resource protection - deferred maintenance; 0% Critical resource protection - capital improvement; 0% Critical mission - deferred maintenance; 0% Compliance & other deferred maintenance; 0% Other capital improvements

OUTCOMES*:	ES	WF	OMB	HEC	IAF	SDA	RW	PED	FAR	PRC	TOT
		10	10	70			10				100

PLANNING LINKS: Station Goal/Objective; Station Step-down Mgmt Plan; FWS Ecosystem Goal/Plan; Legal Mandate

Draft CCP: Refuge Habitat Objective #2 - to reduce by 15% all nonnative plants, Objective #10 - to reduce by 10% nonnatives in wetlands. District habitat objective #1 strategy - to reduce nonnative plants by 15%. Upland Management Plan-to reduce noxious weeds & increase biological diversity of uplands. Tewaukon WMD "Systems Documentation" Objective statement - demonstrate optimizing the practice of wildlife & wildlands management, help assure the survival in a natural state of plants & animal species, & optimize the abundance & diversity of native wildlife on each WPA.

PROJECT #: ....97009..... **RANK - STATION:** ....3..... **DISTRICT:** ..018... **REGION:** ..084... **NATIONAL:**

4 **Tewaukon NWR** *62660*

HABITAT RESTORATION Upland Restoration

MEASURES: 150 refuge acres will be restored; 20 off-refuge acres will be restored

Also includes work on Tewaukon WMD (outputs for off refuge acres are for the district)

Tallgrass prairie is disappearing at a rapid rate & along with it unique wildlife communities. Both the Refuge & District Waterfowl Production Areas contain some native Tallgrass sod. However, some of the areas consist of degraded domestic grasses,cropland,CRP or seeded monocultures of native grasses which have little wildlife value. These areas need to be hayed,sprayed & interseeded with a mixture of native grasses & forbs to restore the Tallgrass prairie. Mgmt. will include a mixture of burning, mowing & spot spraying for noxious weeds as necessary. Once established,the native stands will provide good waterfowl, prairie wildlife, & other resident wildlife habitat. This is one of the top priorities to the ecoteam & other partners. Remaining tallgrass prairie is less than 1% & provides for declining native grassland birds.

ADDITIONAL FUNDS NEEDED ($000):

	One-Time	Recurring Base	First Year Need
Construction Costs.....			
Operations: Personnel Costs.....		22	
Equipment Cost.....	160		
Facility Cost.....	3		
Services/Supplies.....	55	55	
Miscellaneous Costs.....	15	15	
TOTAL Operations Cost.....	233	92	325

ADDITIONAL PERMANENT STAFF NEEDED:

	FTEs	Cost ($000)
Managers.....		$0
Biologists.....		$0
Resource Specialists.....		$0
Education/Recreation Staff.....		$0
Law Enforcement.....		$0
Clerical/Administrative.....		$0
Maintenance/Equipment Operation.....	0.5	$22
TOTAL FTEs Needed.....	0.5	$22

EMPHASIS: 0% Critical health & safety - deferred maintenance; 0% Critical health & safety - capital improvement; 0% Critical resource protection - deferred maintenance; 0% Critical resource protection - capital improvement; 0% Critical mission - deferred maintenance; 0% Compliance & other deferred maintenance; 0% Other capital improvements

OUTCOMES*:	ES	WF	OMB	HEC	IAF	SDA	RW	PED	FAR	PRC	TOT
		25	20	50			5				100

PLANNING LINKS: Station Goal/Objective; Station Step-down Mgmt Plan; FWS Ecosystem Goal/Plan

Draft CCP: Refuge Habitat Objective #1 - maintain existing tallgrass prairie in good condition, Objective #3 - provide six sites for declining grassland birds in good habitat, Objective #5 - convert 600 acres of nonnative an warm season native grasses to a diverse native floral community, Wildlife Objective #3 - monitoring of four tallgrass prairie indication bird species for feedback on tallgrass habitat treatments, Wildlife Objective #5 - monitoring of relative abundance of three rare butterflies for feedback on tallgrass habitat treatments. District Habitat

PROJECT #: ...97001..... **RANK - STATION:** ....4..... **DISTRICT:** ..072... **REGION:** ..110... **NATIONAL:**

5 **Tewaukon NWR** *62660*

RESOURCE PROTECTION Law Enforcement

MEASURES: 200 incidents will be documented; 500 other public contacts will be made; 100 cases will be assisted; 300 sites will be better secured

Also includes work on Tewaukon WMD

The Refuge Complex has over 32,000 acres of easement agreements protecting wetlands & grasslands, 14,000 acres of Waterfowl Production Areas & 8,400 acres on the Refuge. Enforcement of these areas can be time consuming & requires documentation of easement activities & many permittee contacts. This effort would inform landowners about the easement on their land & provide information as to its regulations & implications. Efforts would also involve mapping of protected wetlands, enforcement of migratory bird regulations, assistance to public safety for visitors, enforcement of fishing regulations & protection of refuge facilities & equipment. Increased urbanization in Fargo & Wapheton will increase the visitor use on the refuge for fishing, hunting, bird watching & hiking. Currently two collateral duty officers is insufficient.

ADDITIONAL FUNDS NEEDED ($000):

	One-Time	Recurring Base	First Year Need
Construction Costs.....			
Operations: Personnel Costs.....	35	58	
Equipment Cost.....	50		
Facility Cost.....	2		
Services/Supplies.....	30	20	
Miscellaneous Costs.....	65	10	
TOTAL Operations Cost.....	182	88	270

ADDITIONAL PERMANENT STAFF NEEDED:

	FTEs	Cost ($000)
Managers.....		$0
Biologists.....		$0
Resource Specialists.....		$0
Education/Recreation Staff.....		$0
Law Enforcement.....	1.0	$58
Clerical/Administrative.....		$0
Maintenance/Equipment Operation.....		$0
TOTAL FTEs Needed.....	1.0	$58

EMPHASIS: 0% Critical health & safety - deferred maintenance; 0% Critical health & safety - capital improvement; 0% Critical resource protection - deferred maintenance; 0% Critical resource protection - capital improvement; 0% Critical mission - deferred maintenance; 0% Compliance & other deferred maintenance; 0% Other capital improvements

OUTCOMES*:	ES	WF	OMB	HEC	IAF	SDA	RW	PED	FAR	PRC	TOT
		70	20	10							100

PLANNING LINKS: Legal Mandate; Station Goal/Objective; FWS Ecosystem Goal/Plan

Draft CCP Refuge Wildlife Disturbance Objectives (3), Refuge Public Use Goal & Objectives- management of public use & safety. District Habitat Objective #5 - protect grassland easements, Habitat Objective #9 - protect wetland easements, District public use goal & objectives (4). Refuge Administration Act/Prohibitive Acts Provisions-monitor & protect wetland resources acquired by the USFWS including wetland easements. This will help Tewaukon to monitor land owner changes, provide information to current landowners, & attempt to reduce the number of easement violations which occur due to lack of knowledge. Would also protect other properties & enforce migratory bird regulations

PROJECT #: 97007 **RANK - STATION:** 5 **DISTRICT:** 999 **REGION:** 999 **NATIONAL:**

6 **Tewaukon WMD** *62664*

COORDINATION ACTIVITIES Private Land Activities (excluding restoration)

MEASURES: 25 landowners will be assisted; 3500 acres will be affected; 30 % effort will be for uplands; 15 % effort will be for wetlands; 55 % effort will be for deepwater/riverine habitats

This project would promote habitat for wildlife on private lands including upland restoration, riverine protection, grazing systems, predator exclosures, nesting structures, food plots etc. and seek other opportunities to improve wildlife habitat. It is especially critical to work with adjacent landowners to the refuge to improve water quality coming into the refuge. This can be accomplished with riparian protection and grazing systems. The refuge currently has a very high fecal coliform bacteria count. This work would be done with partners including NAWCA, USDA (CRP, WHIP programs), Wetland Trust and conservation districts. Concerns are that some of the existing programs will expire and land currently in CRP or tallgrass prairie will be lost.

ADDITIONAL FUNDS NEEDED ($000):

	One-Time	Recurring Base	First Year Need
Construction Costs.....			
Operations: Personnel Costs.....	35	48	
Equipment Cost.....	35		
Facility Cost.....	2		
Services/Supplies.....	5	50	
Miscellaneous Costs.....	5	5	
TOTAL Operations Cost.....	82	103	185

ADDITIONAL PERMANENT STAFF NEEDED:

	FTEs	Cost ($000)
Managers.....		$0
Biologists.....	1.0	$48
Resource Specialists.....		$0
Education/Recreation Staff.....		$0
Law Enforcement.....		$0
Clerical/Administrative.....		$0
Maintenance/Equipment Operation.....		$0
TOTAL FTEs Needed.....	1.0	$48

EMPHASIS: 0% Critical health & safety - deferred maintenance; 0% Critical health & safety - capital improvement; 0% Critical resource protection - deferred maintenance; 0% Critical resource protection - capital improvement; 0% Critical mission - deferred maintenance; 0% Compliance & other deferred maintenance; 0% Other capital improvements

OUTCOMES*:	ES	WF	OMB	HEC	IAF	SDA	RW	PED	FAR	PRC	TOT
		50	20	30							100

PLANNING LINKS: Station Goal/Objective; FWS Ecosystem Goal/Plan

Draft CCP Refuge Partnership Goal and Objectives (2), District Habitat Objective #3 - preserve the remaining tallgrass prairie, District Partnership Goal and Objective. Ecosystem Goal (tallgrass prairie) - Preserve all remaining tallgrass prairie sites in North Dakota and develop and implement a plan to restore up to 5% of the original tallgrass prairie base to functioning tallgrass prairie.

PROJECT #: 97032 **RANK - STATION:** 6 **DISTRICT:** 999 **REGION:** 999 **NATIONAL:**

Over the past several years the station staff (including seasonals) as increased from 10 to 16. Offices intended for one occupant are being shared by two and additional staff increases are expected (up to 10 additional for minimum staffing). This project would add safe staff work space, storage for sensitive and costly equipment and administrative staff to handle additional work loads. Construct of a 5,000-s.f. addition to the refuge office to improve refuge staff working conditions. Cost includes furnishing of the office and storage space. Increasing of office space for employees will provide an increase in employee efficiency, moral, & accomplishment of management goals. Current conditions tend to distract employees making accomplishment of work difficult.

ADDITIONAL FUNDS NEEDED ($000):

	One-Time	Recurring Base	First Year Need
Construction Costs	1,000		
Operations: Personnel Costs		39	
Equipment Cost	70		
Facility Cost	6		
Services/Supplies	15	15	
Miscellaneous Costs		10	
TOTAL Operations Cost	91	64	155

ADDITIONAL PERMANENT STAFF NEEDED:

	FTEs	Cost ($000)
Managers		$0
Biologists		$0
Resource Specialists		$0
Education/Recreation Staff		$0
Law Enforcement		$0
Clerical/Administrative	1.0	$39
Maintenance/Equipment Operation		$0
TOTAL FTEs Needed	1.0	$39

EMPHASIS: 5% Critical health & safety - deferred maintenance; 15% Critical health & safety - capital improvement; 0% Critical resource protection - deferred maintenance; 0% Critical resource protection - capital improvement; 7.5% Critical mission - deferred maintenance; 12.5% Compliance & other deferred maintenance; 60% Other capital improvements

OUTCOMES*:	ES	WF	OMB	HEC	IAF	SDA	RW	PED	FAR	PRC	TOT
		50	15	15			10	10			100

PLANNING LINKS: Station Goal/Objective; Legal Mandate

Draft CCP: this will assist in the accomplishment of all Refuge and District Goals and Objectives for the CCP. Increasing of office space for employees will provide an increase in employee efficiency, moral, & accomplishment of management goals. Current conditions tend to distract employees making accomplishment of work difficult. Additional storage space will provide for protection of government purchased equipment for longer life and security of equipment. Additional administrative staff will allow for more efficient processing of required paperwork for the increase in staff.

PROJECT #: 98033 **RANK - STATION:** 7 **DISTRICT:** 999 **REGION:** 999 **NATIONAL:**

8 **Tewaukon NWR** *62660*

PUBLIC EDUCATION & RECREATION Provide Visitor Services

MEASURES: 5000 new visitors will be served; 15000 existing visitors will be served; 80 % will support the top 6 priority public uses; 20 % will support non-priority public uses

Also includes work on Tewaukon Wetland Management District

Currently a need exists for better visitor services on the Refuge and outreach for the Complex. Most of our use occurs during weekend hours when the contact station is not open. Due to large growing population centers within 100 miles our use may be larger than currently estimated. This results in an uninformed public on refuge resources. Project would provide staffing of office on weekends, staff for refuge tours, improve/expand visitor center, produce professional leaflets to educate and interpret refuge resources. Build an interpretive nature trail and wildlife observation platform for visitors. Develop interpretive panels for outdoor kiosks. Staff would also work with local sportsmen's groups to improve refuge visitor facilities. Develop Complex web site, refuge video, Jr. Duck Stamp and conduct outreach.

ADDITIONAL FUNDS NEEDED ($000):

	One-Time	Recurring Base	First Year Need
Construction Costs	1,500		
Operations: Personnel Costs	50	58	
Equipment Cost	90		
Facility Cost	5		
Services/Supplies	100	30	
Miscellaneous Costs	25	25	
TOTAL Operations Cost	270	113	383

ADDITIONAL PERMANENT STAFF NEEDED:

	FTEs	Cost ($000)
Managers		$0
Biologists		$0
Resource Specialists		$0
Education/Recreation Staff	1.0	$58
Law Enforcement		$0
Clerical/Administrative		$0
Maintenance/Equipment Operation		$0
TOTAL FTEs Needed	1.0	$58

EMPHASIS: 2% Critical health & safety - deferred maintenance; 8% Critical health & safety - capital improvement; 2% Critical resource protection - deferred maintenance; 8% Critical resource protection - capital improvement; 6% Critical mission - deferred maintenance; 10% Compliance & other deferred maintenance; 64% Other capital improvements

OUTCOMES*:	ES	WF	OMB	HEC	IAF	SDA	RW	PED	FAR	PRC	TOT
								70		30	100

PLANNING LINKS: Station Goal/Objective; Station Step-down Mgmt Plan

Draft CCP: Refuge Public Use Goal and Objectives (9), Refuge Partnership Goal and Objectives (2), District Public Use Goal and Objectives (4), District Partnership Goal and Objective. Refuge Master Plan Objective #2: to provide for public observation of wildlife species in their natural environment and #3: to provide limited day use recreation, including public hunting where and when such activities are compatible with primary management objectives of the refuge.

PROJECT #: 97003 **RANK - STATION:** 8 **DISTRICT:** 999 **REGION:** 999 **NATIONAL:**

9 **Tewaukon NWR** *62660*

HABITAT MANAGEMENT Fire Management

MEASURES: 1500 refuge acres burned under prescription; 15 refuge burns will be conducted; 50 non-refuge acres will be burned under prescription; 10 wildfires will be suppressed

Also includes work on Tewaukon WMD, Waubay Complex, Sand Lake Complex, Kulm WMD

The prescribed fire program at the Tewaukon NWR Complex is growing and will greatly expand in the near future as responsibilities increase. There is a need to bring in a fire ecologist to review the habitat and the prescribed burning program to help the Complex achieve its goals of improving habitat with the use of management ignited fire. Information to be gathered will include condition of the habitat, exotic species or weeds that can be controlled by fire, best times of the year to burn for specific goals and burn schedules. This information will help managers to evaluate current management and decide on more effective management by the use of fire at specific times.

ADDITIONAL FUNDS NEEDED ($000):

	One-Time	Recurring Base	First Year Need
Construction Costs.....			
Operations: Personnel Costs.....	40	48	
Equipment Cost.....	30		
Facility Cost.....	4		
Services/Supplies.....	20	10	
Miscellaneous Costs.....	55	35	
TOTAL Operations Cost.....	149	93	242

ADDITIONAL PERMANENT STAFF NEEDED:

	FTEs	Cost ($000)
Managers.....		$0
Biologists.....		$0
Resource Specialists.....	1.0	$48
Education/Recreation Staff.....		$0
Law Enforcement.....		$0
Clerical/Administrative.....		$0
Maintenance/Equipment Operation.....		$0
TOTAL FTEs Needed.....	1.0	$48

EMPHASIS: 0% Critical health & safety - deferred maintenance; 0% Critical health & safety - capital improvement; 0% Critical resource protection - deferred maintenance; 0% Critical resource protection - capital improvement; 0% Critical mission - deferred maintenance; 0% Compliance & other deferred maintenance; 0% Other capital improvements

OUTCOMES*:	ES	WF	OMB	HEC	IAF	SDA	RW	PED	FAR	PRC	TOT
		40	30	20			10				100

PLANNING LINKS: FWS Ecosystem Goal/Plan; Station Goal/Objective

Draft CCP: Refuge Habitat Objectives (11), District Habitat Objectives (12). Station objectives include: Preserve, restore and enhance the diverse native floral communities on the Refuge and District.

PROJECT #: 99042 **RANK - STATION:** 9 **DISTRICT:** 999 **REGION:** 999 **NATIONAL:** 999

10 **Tewaukon NWR** *62660*

RESOURCE PROTECTION Cultural Resource Management

MEASURES: 10 investigations will be conducted; 20 sites will be documented; 500 museum property items will be maintained

Also includes work on Tewaukon WMD

Tewaukon NWR is located in the Sisseton-Wapheton Sioux Native American Reservation and has several located cultural and archeological sites. However the majority of the refuge and district has not been inventoried. Various Federal laws, regulations and executive orders require Federal agencies to locate, protect, interpret, record, evaluate and nominate significant prehistoric and historic resources on Federal land. This would assist in historical records and management direction for the Complex Comprehensive Conservation Plan. Would also assist with existing management of cultural and archeological items in storage and displayed.

ADDITIONAL FUNDS NEEDED ($000):

	One-Time	Recurring Base	First Year Need
Construction Costs.....			
Operations: Personnel Costs.....	30		
Equipment Cost.....	10		
Facility Cost.....	2		
Services/Supplies.....	10	15	
Miscellaneous Costs.....	5	5	
TOTAL Operations Cost.....	57	20	77

ADDITIONAL PERMANENT STAFF NEEDED:

	FTEs	Cost ($000)
Managers.....		$0
Biologists.....		$0
Resource Specialists.....		$0
Education/Recreation Staff.....		$0
Law Enforcement.....		$0
Clerical/Administrative.....		$0
Maintenance/Equipment Operation.....		$0
TOTAL FTEs Needed.....		$0

EMPHASIS: 0% Critical health & safety - deferred maintenance; 0% Critical health & safety - capital improvement; 0% Critical resource protection - deferred maintenance; 0% Critical resource protection - capital improvement; 0% Critical mission - deferred maintenance; 0% Compliance & other deferred maintenance; 0% Other capital improvements

OUTCOMES*:	ES	WF	OMB	HEC	IAF	SDA	RW	PED	FAR	PRC	TOT

PLANNING LINKS: Station Goal/Objective; Legal Mandate

Draft CCP: Refuge Public Use Objective # 8 - preserve and protect existing cultural resources, Refuge Public Use Objective # 9 - promote public awareness of cultural resources, District Public Use Objective #3 - Conduct cultural resource inventories on WPAs, District Public Use Objective # 4 - preserve and protect cultural resources on the District. Station Goal/Objective includes the protection and inventory of archeological and cultural sites. Archaeological Resource Protection Act, NWRS Improvement Act, Refuge Recreation Act, Executive Order.

PROJECT #: 99040 **RANK - STATION:** 10 **DISTRICT:** 999 **REGION:** 999 **NATIONAL:** 999

11 **Tewaukon NWR** *62660*

RESOURCE PROTECTION Water Rights Management

MEASURES: 20 % effort will be for identification; 80 % effort will be for quantification; 15 water rights will be supported or protected

Also includes work on Tewaukon WMD, Storm Lake Easement Refuge and Wild Rice Easement Refuge

Currently no accurate way to quantify water use on the Refuge. Water is critical to the Refuge for its main purpose of waterfowl management. Project would install water measurement devices (data loggers for pools and a laptop to download the information).to protect Refuge water rights & to provide information on use to the State. Measurement devices are used to quantify the extent of each water right & then to determine whether the Refuge is receiving the water it is legally entitled to & to document continuing beneficial use. Currently station only has known water rights for the refuge & easement refuges. WPAs & wetland easements do not have water rights & they need protection from drainage due to lowering of water table by irrigators or public water companies. Need to research water rights for WPAs & wetland easements in our three counties.

ADDITIONAL FUNDS NEEDED ($000):

	One-Time	Recurring Base	First Year Need
Construction Costs.....			
Operations: Personnel Costs.....	40		
Equipment Cost.....	355		
Facility Cost.....			
Services/Supplies.....	20	5	
Miscellaneous Costs.....	22	25	
TOTAL Operations Cost.....	437	30	467

ADDITIONAL PERMANENT STAFF NEEDED:

	FTEs	Cost ($000)
Managers.....		$0
Biologists.....		$0
Resource Specialists.....		$0
Education/Recreation Staff.....		$0
Law Enforcement.....		$0
Clerical/Administrative.....		$0
Maintenance/Equipment Operation.....		$0
TOTAL FTEs Needed.....		$0

EMPHASIS: 0% Critical health & safety; 50% Critical resource protection; 50% Critical mission; 0% Other important needs

OUTCOMES*:	ES	WF	OMB	HEC	IAF	SDA	RW	PED	FAR	PRC	TOT
		60	15	15			10				100

PLANNING LINKS: Station Goal/Objective

Draft CCP: Refuge Habitat Objective #6 - provide for 20% of each wetland category (ie deep, shallow) for migratory birds, Refuge Habitat Objective # 7 - protect existing and clarify water rights on Refuge Wetlands. District Habitat Objective # 7 - clarification of district water rights to provide long term protection of water resources.

PROJECT #: .....98029..... **RANK - STATION:** ....11.... **DISTRICT:** ..099... **REGION:** ...173... **NATIONAL:**

12 **Tewaukon NWR** *62660*

FISH & WILDLIFE MANAGEMENT Pest, Predator & Exotic Animal Control

MEASURES: 700 mammals will be removed; 3 exclusionary fenced areas will be maintained

Also includes work on Tewaukon WMD

The largest obstacle to waterfowl nesting success on the Refuge and District are predators. Nest success can be increase by the removal of predators (skunk, raccoon, mink, fox) in the spring before nesting and when water conditions are favorable for duck production and grassland bird production. This project would improve duck nest success on the refuge by conducting wide spread trapping of these species. It would also focus on monitoring the predator populations to improve knowledge of when to properly apply the methods without total detriment to their populations. Many of the areas on in the District are heavily farmed leaving little residual cover for safe waterfowl and grassland bird nesting. Predators tend to concentrate on the areas with grass cover (like WPAs) resulting in very low nest success. Wide spread spring trapping, predator exclosure fences and nesting islands will be used in the district to increase nest success 60%.

ADDITIONAL FUNDS NEEDED ($000):

	One-Time	Recurring Base	First Year Need
Construction Costs.....			
Operations: Personnel Costs.....	15		
Equipment Cost.....	80		
Facility Cost.....	2		
Services/Supplies.....	195	30	
Miscellaneous Costs.....	35	25	
TOTAL Operations Cost.....	327	55	382

ADDITIONAL PERMANENT STAFF NEEDED:

	FTEs	Cost ($000)
Managers.....		$0
Biologists.....		$0
Resource Specialists.....		$0
Education/Recreation Staff.....		$0
Law Enforcement.....		$0
Clerical/Administrative.....		$0
Maintenance/Equipment Operation.....		$0
TOTAL FTEs Needed.....		$0

EMPHASIS: 0% Critical health & safety - deferred maintenance; 0% Critical health & safety - capital improvement; 0% Critical resource protection - deferred maintenance; 0% Critical resource protection - capital improvement; 0% Critical mission - deferred maintenance; 0% Compliance & other deferred maintenance; 0% Other capital improvements

OUTCOMES*:	ES	WF	OMB	HEC	IAF	SDA	RW	PED	FAR	PRC	TOT
		90	10								100

PLANNING LINKS: Station Goal/Objective

Draft CCP: Refuge Wildlife Objective # 1 - maintain an average upland duck nesting success of at least 30% (Mayfield) for increased waterfowl production on the Refuge, District Wildlife Objective #1 - maintain an average upland duck nesting success of at least 30% (Mayfield) for increased waterfowl production on the District. Refuge Master Plan Goal #1 Provide Optimum nesting habitat for ducks.

PROJECT #: .....98003..... **RANK - STATION:** ...12... **DISTRICT:** ...999... **REGION:** ...999... **NATIONAL:**

RMIS - Maintenance Management System (MMS)
Record View

Station: Tewaukon NWR HQ: Tewaukon NWR

Main ecosys: Missouri Main Stem

Org code: 62660 State: ND Cong dist: ND00

Project no.: 89008 Project no. subelement:

Prop desc: Dozer, cat d-7; Prop #: 632821

Project title: Replace deteriorated dozer

Project desc: Replace deteriorated heavy equipment (dozer) with a low ground pressure dozer D5M. The older style dozer is heavy an easier to get stuck in wet areas. Concerned with the weight of and safe hauling of the larger dozer. Have been having difficulties finding parts for the older dozer. D5M dozer is capable of accessing wetter areas for dike repairs and water structure rehabilitation.

Measures: Number of vehicles: 1

Cost estimate: $148 Engineering cost included in cost est:

Cost est date: 1997 Cost est method: Contractor Quote FY group: B

Backlog: $148 FY completed: FY obligations: $0

Cumulative obligations: $0

Fund source: R = *Resource Management* Percent complete: 0%

Other possible fund source:

○ TEA21 (Refuge Roads)	○ Quarters	○ Other
○ TEA21 (Other)	○ RecFee	
○ Title V	○ Contaminants	
○ Fire	○ Supplemental	

Fix type: ○ Repair/rehab ◉ Replace ○ Remove Condition assessment: Fair

Emphasis:

CHS	CRP	CM	OI	TOT
0	30	0	70	100

Type:

DM	CI	TOT
100	0	100

Safety? ☒ I

Outcomes:

ES	WF	OMB	HEC	IAF	SDA	RW	FAR	PED	PRC	TOT
0	60	20	0	0	0	10	0	0	10	100

Maint code: 780 = *Agr/Const/Industrial Vehicles*

Station rank: 2 Dist rank: Reg rank: 124 Nat rank: 2

DOI rank: 420

RO support needs: ☐ Engineering ☒ Contracting ☐ Force Account [

Project notes:

This new equipment will assist in repairs to flood damage and 12 yr. maintenance backlog which is not possible with the existing equipment due to wet working conditions.

Updated 1/6/98

RMIS - Maintenance Management System (MMS)
Record View

Station: Tewaukon NWR HQ: Tewaukon NWR

Main ecosys: Missouri Main Stem

Org code: 62660 State: ND Cong dist:

Project no.: 99043 Project no. subelement:

Prop desc: 1 Ton Diesel Truck Prop #: 624585

Project title: Replace worn 1986 1 ton Diesel Truck

Project desc: Replace worn 1986 1 ton Diesel Truck (mileage 26662). Utilized for fencing and hauling of materials to job sites.

Measures: Number of trucks: 1

Cost estimate: $45 Engineering cost included in cost est:

Cost est date: 1999 Cost est method: Vendor/List Price FY group: 9999

Backlog: $45 FY completed: FY obligations: $0

Cumulative obligations: $0

Fund source: R = *Resource Management* Percent complete: 0%

Other possible fund source:

○ TEA21 (Refuge Roads)	○ Quarters	○ Other
○ TEA21 (Other)	○ RecFee	
○ Title V	○ Contaminants	
○ Fire	○ Supplemental	

Fix type: ○ Repair/rehab ◉ Replace ○ Remove Condition assessment: Poor

Emphasis:

CHS	CRP	CM	OI	TOT
0	20	0	80	100

Type:

DM	CI	TOT
100		100

Safety? ☐

Outcomes:

ES	WF	OMB	HEC	IAF	SDA	RW	FAR	PED	PRC	TOT
0	40	20	20	0	0	10	0	0	10	100

Maint code: 778 = *Trucks, Light (<8,500 lbs.)*

Station rank: 3 Dist rank: 999 Reg rank: 999 Nat rank: 2342

DOI rank: 380

RO support needs: ☐ Engineering ☒ Contracting ☐ Force Account [

Project notes:

Updated 5/6/99

RMIS - Maintenance Management System (MMS)
Record View

Station: Tewaukon NWR HQ: Tewaukon NWR

Main ecosys: Missouri Main Stem

Org code: 62660 State: ND Cong dist: ND00

Project no.: 97003 Project no. subelement:

Prop desc: Signs & Kiosk panels Prop #: S001860

Project title: Replace 25 worn and faded public safety signs and interpretive panels

Project desc: Replace 12 worn and faded public safety signs (ice fishing, ice conditions, etc.) signs and interpretive 3x4 panels and monuments in high public use areas on the Refuge. Many of the signs and panels are over 15 years old and have become faded and unreadable. Replace one vandalized interpretive panel on historic values and Native American cultures in the area. Replace 12 wooden hunter parking signs.

Measures: Number of signs: 1

Cost estimate: $39 Engineering cost included in cost est:

Cost est date: 1999 Cost est method: Historical/Manager FY group: C

Backlog: $39 FY completed: Estimate FY obligations: $0

Cumulative obligations: $0

Fund source: R = *Resource Management* Percent complete: 0%

Other possible fund source:

○ TEA21 (Refuge Roads)	○ Quarters	◉ Other
○ TEA21 (Other)	○ RecFee	
○ Title V	○ Contaminants	
○ Fire	○ Supplemental	

Fix type: ○ Repair/rehab ◉ Replace ○ Remove Condition assessment: Poor

Emphasis:

CHS	CRP	CM	OI	TOT
20	10	0	70	100

Type:

DM	CI	TOT
100	0	100

Safety? ☒ C

Outcomes:

ES	WF	OMB	HEC	IAF	SDA	RW	FAR	PED	PRC	TOT
0	25	15		0	0		0	10	50	100

Maint code: 556 = *Signs*

Station rank: 5 Dist rank: Reg rank: 999 Nat rank: 2

DOI rank: 480

RO support needs: ☐ Engineering ☒ Contracting ☐ Force Account [

Project notes:

These signs not only guide our visitors to points of interets and interpret managment activies but also address many important safety concerns on the Refuge. Current hunter parking signs have become worn and make it difficult for visitors to locate safe parking areas for the Refuge hunting season. Tactile panels for four kiosks approx. 4K each, regular panels (3) 2K each, 8x5 panels 3K each. Possibility of partners for the historical monuments. General Sibley monument was previously purchased by local sportsmen's clubs.

Updated 1/6/98

RMIS - Maintenance Management System (MMS)
Record View

Station: Tewaukon NWR HQ: Tewaukon NWR

Main ecosys: Missouri Main Stem

Org code: 62660 State: ND Cong dist: ND00

Project no.: 20087 Project no. subelement: A (20087-A)

Prop desc: Replace dikes 16-2 & 16-3 Prop #: 126

Project title: Replace control structure and repair dike of Horseshoe Pool B and Pool C

Project desc: Replace the water control structure in Pool B (16-2) and repair the existing dike. Worn structures can cause additional damage to adjacent structures and private landowner property. This structure provides marsh habitat for all types of waterbirds and other wildlife.

Measures: Number of structures: 1

Cost estimate: $50 Engineering cost included in cost est: $8

Cost est date: 2000 Cost est method: Historical/Manager FY group: 9999

Backlog: $50 FY completed: Estimate FY obligations: $0

Cumulative obligations: $0

Fund source: C = *Construction* Percent complete: 0%

Other possible fund source:

○ TEA21 (Refuge Roads)	○ Quarters	○ Other
○ TEA21 (Other)	○ RecFee	
○ Title V	○ Contaminants	
○ Fire	○ Supplemental	

Fix type: ◉ Repair/rehab ○ Replace ○ Remove Condition assessment: Fair

Emphasis:

CHS	CRP	CM	OI	TOT
5	10	10	75	100

Type:

DM	CI	TOT
80	20	100

Safety? ☒ C

Outcomes:

ES	WF	OMB	HEC	IAF	SDA	RW	FAR	PED	PRC	TOT
0	60	20	10	0	0	10	0	0	0	100

Maint code: 440 = *Water Control Structures*

Station rank: 7 Dist rank: 999 Reg rank: 999 Nat rank: 2354

DOI rank: 346

RO support needs: ☒ Engineering ☒ Contracting ☐ Force Account [

Project notes:

This project needs to be accomplished in conjunction with the adjacent Pool 16-3 (C Pool). C Pool information is available in 20087B

Updated 3/27/2000

RMIS - Maintenance Management System (MMS)
Record View

Station: Tewaukon WMD HQ: Tewaukon NWR

Main ecosys: Missouri Main Stem

Org code: 62664 State: ND Cong dist:

Project no.: 99045 Project no. subelement:

Prop desc: 1 ton vehicle Prop #: 624659

Project title: Replace worn 1 ton vehicle

Project desc: Replace worn 1991 Dodge Utility 1 ton. Used for spraying of weeds on the refuge and district to comply with State regulations.

Measures: Number of trucks: 1

Cost estimate: $45 Engineering cost included in cost est:

Cost est date: 1999 Cost est method: Vendor/List Price FY group: 9999

Backlog: $45 FY completed: FY obligations: $0

Cumulative obligations: $0

Fund source: R = *Resource Management* Percent complete: 0%

Other possible fund source:

○ TEA21 (Refuge Roads)	○ Quarters	○ Other
○ TEA21 (Other)	○ RecFee	
○ Title V	○ Contaminants	
○ Fire	○ Supplemental	

Fix type: ○ Repair/rehab ◉ Replace ○ Remove Condition assessment: Fair

Emphasis:

CHS	CRP	CM	OI	TOT
0	0	0	100	100

Type:

DM	CI	TOT
100		100

Safety? ☐

Outcomes:

ES	WF	OMB	HEC	IAF	SDA	RW	FAR	PED	PRC	TOT
0	30	20	20	0	0	20	0	0	10	100

Maint code: 778 = *Trucks, Light (<8,500 lbs.)*

Station rank: 8 Dist rank: 999 Reg rank: 999 Nat rank: 2345

DOI rank: 300

RO support needs: ☐ Engineering ☒ Contracting ☐ Force Account [

Project notes:

Updated 5/6/99

RMIS - Maintenance Management System (MMS)
Record View

Station: Tewaukon NWR HQ: Tewaukon NWR

Main ecosys: Missouri Main Stem

Org code: 62660 State: ND Cong dist:

Project no.: 96002 Project no. subelement:

Prop desc: Interpretive map display Prop #: 624739

Project title: Replace deteriorated Refuge map display

Project desc: The Refuge map display is located in the Refuge Visitor Center and is used extensively to orient visitors to the Refuge natural resource features, recreational facilities and opportunites, roads, trail, and boundaries. The current map display is faded and worn from years of use and does not meet accessibility requirements. The replacement map display would be user friendly, and more accessible to visitors.

Measures: Number of contact points: 1

Cost estimate: $30 Engineering cost included in cost est:

Cost est date: 1998 Cost est method: Historical/Manager Estimate FY group: 9999

Backlog: $30 FY completed: FY obligations: $0

Cumulative obligations: $0

Fund source: R = *Resource Management* Percent complete: 0%

Other possible fund source:

○ TEA21 (Refuge Roads)	○ Quarters	○ Other
○ TEA21 (Other)	○ RecFee	
○ Title V	○ Contaminants	
○ Fire	○ Supplemental	

Fix type: ○ Repair/rehab ◉ Replace ○ Remove Condition assessment: Fair

Emphasis:

CHS	CRP	CM	OI	TOT
0	25	50	25	100

Type:

DM	CI	TOT

Safety? ☐

Outcomes:

ES	WF	OMB	HEC	IAF	SDA	RW	FAR	PED	PRC	TOT
0	20	10	0	0	0	10	0	40	20	100

Maint code: 560 = *Visitor Contact Points*

Station rank: 10 Dist rank: 999 Reg rank: 999 Nat rank: 2356

DOI rank: 450

RO support needs: ☐ Engineering ☒ Contracting ☐ Force Account [

Project notes:

The display is important in guiding our visitors to safe and enjoyable places to recreate and away from wildlife sensative areas that are closed to the public.

Updated 4/7/2000

Appendix K. Literature Cited

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Appendix L. Waterfowl Production Areas Priority Management Tables

WPA Units	County	Acres	Mean Pair Density	Unique Resources	Priority Level
Englevale Complex	Ransom	1,187.75	68 pair		High
Smith/Tanner/Buckmiller	Ransom	646.62	68 pair		High
Strander/Skonseng/Peterson	Ransom	280.30	45-68 pair	Tallgrass prairie	High
McCann/McGill/Isley	Ransom	324.93	45-68 pair	Tallgrass prairie	High
Weaver/Coit/Schiffner	Ransom	403.53	68 pair	Tallgrass prairie	High
Biggs/Berndt	Richland	479.35	27-45 pair	Tallgrass prairie Rare butterflies	High
Biggs/Anderson/Anderson/ Larson/Swanson/Ostby	Richland	609.47	27-45 pair	Tallgrass prairie	High
Krause/Ahrens/Arndt	Richland	117.85	45-68 pair	Tallgrass prairie	High
Bladow	Richland	275.97	45-68 pair		High
Gunness/Boldt/Hentz/Elsen	Richland	657.10	27-45 pair	Tallgrass prairie Rare butterflies White lady's slipper	High
Hartleben/Aaser/Prochnow	Richland	1,627.23	27-45 pair	Tallgrass prairie Rare butterflies White lady's slipper	High
Kuehn	Richland	317.52	68 pair	Tallgrass prairie	High
Willprecht/Nechas/Hegar	Richland	240.96	45 pair		High
Chris Schuler/East Leack	Richland	240.00	45 pair	Tallgrass prairie	High
Wollitz/Paetzke/Stenson	Richland	506.46	45-68 pair		High
Palensky/Widmer	Sargent	449.64	93-113 pair	Tallgrass prairie	High
Evanson	Sargent	169.52	93 pair		High
Evanson/Anderson	Sargent	198.80	93 pair		High
Gainor	Sargent	843.96	45 pair	Tallgrass prairie	High
Krause	Sargent	200.00	68 pair	Tallgrass prairie Rare butterflies	High
Nelson/Klefstad	Sargent	390.16	68 pair		High
Palensky/Wyum/Kaske	Sargent	238.83	68 pair		High

WPA Units	County	Acres	Mean Pair Density	Unique Resources	Priority Level
Blikre/Chose	Ransom	129.09	27-45 pair		Moderate
Compson	Ransom	162.08	27-45 pair		Moderate
Warner	Ransom	160.00	27 pair		Moderate
Wiltse/Kaspari	Ransom	239.16	27-45 pair		Moderate
Ford	Richland	128.94	68 pair	Tallgrass prairie small tract	Moderate
Gaukler	Richland	162.71	45 pair		Moderate
Smith	Richland	159.81	68 pair		Moderate
Vogeler/Haaland	Richland	162.41	27 pair		Moderate
Asche	Sargent	159.44	68 pair		Moderate
Bauer	Sargent	322.52	45 pair		Moderate
Even	Sargent	84.86	68 pair		Moderate
Litchfield	Sargent	156.68	45 pair		Moderate
Mahrer	Sargent	119.20	68 pair		Moderate
Olson/BN	Sargent	157.37	68 pair		Moderate
Olson, H.	Sargent	159.24	68 pair		Moderate
Saunders	Sargent	143.29	68 pair		Moderate

WPA Units	County	Acres	Mean Pair Density	Unique Resources	Priority Level
Arneson	Ransom	40.00	27 pair		Low
Bachmans	Ransom	100.19	68 pair		Low
Boeder	Ransom	99.78	45 pair		Low
Bueling, A.	Ransom	55.08	27-45 pair		Low
Bueling, L.	Ransom	56.28	27-45 pair		Low
Carlson	Ransom	43.62	93 pair		Low
Dick, L.	Ransom	32.11	45 pair		Low
Kaspari, L.	Ransom	55.00	27 pair		Low
Metzen	Ransom	52.50	27-45 pair		Low
Reinke/Anderson	Ransom	84.36	45 pair		Low
Shelver	Ransom	85.32	27 pair		Low
Boehning	Richland	97.06	45 pair		Low
Korth	Richland	47.46	27-45 pair	Tallgrass prairie small tract	Low
West Leack	Richland	80.00	45 pair		Low
Novetszke	Richland	60.08	45 pair		Low
Lunstad	Sargent	52.93	68-93 pair		Low

Appendix M: Section 7 Consultation

Intra-Service Section 7 Consultation has been initiated with the Bismarck field office of Ecological Services and will be completed prior to the final approval of this Plan.

Appendix N: Mailing List

Federal Officials

- Congressman Earl Pomeroy - Fargo, ND and Washington, D.C.
- Senator Kent Conrad - Fargo, ND and Washington, D.C.
- Senator Byron Dorgan - Fargo, ND and Washington, D.C.

Federal Agencies

- Air Quality Branch- U.S. EPA
- USDA - Aphis
- BIA - Billings Area Office
- Bureau of Reclamation
- Bureau of Land Management
- Corps of Engineers- Bismarck, ND and St. Paul, MN
- Dakota Resource Council
- EPA, Region 8
- FSA - Ransom, Richland, and Sargent Counties
- NPS -Theodore Roosevelt National Park
- NRCS - Ransom, Richland, and Sargent Counties
- USFS - Sheyenne Grasslands
- USFWS Albuquerque, NM; Anchorage, AK; Arapaho NWR; Arlington, VA; Arrowwood NWR; Atlanta, GA; Crescent Lake/N. Platte, NE; Denver, CO; Devils Lake WMD, ND; ES, Bismarck, ND; Fort Snelling, MN; Hadley, MA; HAPET, Bismarck, ND; Juneau, AK; Lake Andes NWR, SD; Air Quality Branch, Lakewood, CO; Medicine Lake NWR, MT; Missouri River Fisheries WAO, Bismarck, ND; Portland, OR; Sacramento, CA; Sherwood, OR; Sand Lake NWR, SD; Shepherdstown, WV; Washington, D.C.; Waubay NWR, SD; WHO, Bismarck, ND
- USGS - BRD Fort Collins, CO and Jamestown, ND

State Officials

- ND Game and Fish Department
  Dean Hildebrand; Brian Kietzman; Tim Phalen
- ND State Historic Preservation Officer
- Representative Kathy Hawken
- Representative Scott Kelsh
- Representative Christopherson
- Representative Wesley Belter
- Representative Rick Berg
- Representative Leroy Bernstein
- Representative Al Carlson
- Representative John Dorso
- Representative Steve Gorman
- Representative Howard Grumbo
- Representative Roy Hausauer
- Representative Robert Huether
- Representative Kim Koppelman
- Representative Douglas Payne
- Representative Sally Sandvig
- Representative Al Soukup
- Representative Allan Stenehjem
- Representative Laurel Thoreson
- Representative Pam and Bill Gulleson
- Senator Tony Grindberg
- Senator Joel Heitkamp
- Senator Judy Lee
- Senator Tim Mathern
- Senator Donna Nalewaja
- Senator Carolyn Nelson
- Senator Jens Tennefos
- Senator Russel Thane

State Agencies

- MN DNR - Fisheries
- MN DNR
- MN Pollution Control Ag
- ND Dept of Health
- ND Forest Service
- ND State Water Commission
- NDSU Extension Service, Fargo and Sargent, Ransom, and Richland Counties
- North Dakota Ag Department

City/County/Local Governments

- Cass County Commissioners
- Mayor Carl Taubert
- Mayor Morris Saxerud
- Mayor Neil Anderson
- Mayor James Banish
- Mayor John Banish
- Mayor Orville Bergh
- Mayor Robert Billing
- Mayor Marty Bjugstad
- Mayor Ronald Boehning
- Mayor Steven Domm
- Mayor Bruce Furness
- Mayor Robert Fust
- Mayor Marilyn Gunderson
- Mayor Debra Heitkamp
- Mayor Brad Hejtmanek
- Mayor Dennis Klosterman
- Mayor Gary Meyer
- Mayor Ed Morrow
- Mayor Ronald Narum
- Mayor Larry Palluck
- Mayor Mitch Papke
- Mayor Duane Pollert
- Mayor Grover Riebe
- Ransom County Sheriff's Office; Weed Board; Commissioners; Water Resource District
- Richland County Sheriff's Office; Weed Board; Commissioners; Historical Society; Water Resource District
- Sargent County Sheriff's Office; Water Resource District; Commissioners; Weed Board
- Twnshp Officer Duane Baldwin
- Twnshp Officer Sonja and Grant Gulleson
- Twnshp Officer Luann Anderson
- Twnshp Officer Perry Anderson
- Twnshp Officer Marcia Asche
- Twnshp Officer Ray Bartholomay
- Twnshp Officer Mark Bartle
- Twnshp Officer Leroy Berg, Jr
- Twnshp Officer Alfred Biggs
- Twnshp Officer Richard Birklid
- Twnshp Officer Ralph Bladow
- Twnshp Officer Jim Bosse
- Twnshp Officer Leslie Brandvold
- Twnshp Officer Renae Branson
- Twnshp Officer David Breuer
- Twnshp Officer Beverly Brezicka
- Twnshp Officer Elmer Buckhaus
- Twnshp Officer Glora Claeys
- Twnshp Officer Mark Fahsholz
- Twnshp Officer Russell Falk
- Twnshp Officer Mark Gauslow
- Twnshp Officer Tom Geffre

P Twnshp Officer Audrey Gilles
P Twnshp Officer Doris Gregor
P Twnshp Officer Harry Hakanson
P Twnshp Officer Lynn Hansen
P Twnshp Officer Cindy Hanson
P Twnshp Officer Sandra Hanson
P Twnshp Officer Barbara Hayen
P Twnshp Officer Don Heitkamp
P Twnshp Officer Vernon Heitkamp
P Twnshp Officer Ken Heley
P Twnshp Officer Wayne Heley
P Twnshp Officer Gladys Humphrey
P Twnshp Officer Clarence Ihme
P Twnshp Officer Norma Jensen
P Twnshp Officer Dale Johnson
P Twnshp Officer Kenneth Johnson
P Twnshp Officer Thomas Kaczynski
P Twnshp Officer Myron Keller
P Twnshp Officer Doran Kersting
P Twnshp Officer Marian Klaman
P Twnshp Officer David Larson
P Twnshp Officer John Larson
P Twnshp Officer Ted Lee
P Twnshp Officer Hermann Lentz
P Twnshp Officer Ronald Lenzen
P Twnshp Officer James Lingen
P Twnshp Officer Russell Martinson
P Twnshp Officer Robert McDaniel
P Twnshp Officer Joyce McDougall
P Twnshp Officer Wayne Meslow
P Twnshp Officer Mike Moellenkamp
P Twnshp Officer James Moffet
P Twnshp Officer Bonita Nelson
P Twnshp Officer Randy Pearson
P Twnshp Officer Bruce Peterson
P Twnshp Officer Jeff Peterson
P Twnshp Officer Wesley Robertsdahl
P Twnshp Officer Karla Schimelfenig
P Twnshp Officer Joan Schlecht
P Twnshp Officer Shera Schneider
P Twnshp Officer Karen Schultz
P Twnshp Officer Michael Schutt
P Twnshp Officer Thomas Smith
P Twnshp Officer Joann Solberg
P Twnshp Officer Terry Spelhaug
P Twnshp Officer Bruce Stein
P Twnshp Officer Janice Swanson
P Twnshp Officer Joseph Thane
P Twnshp Officer Donald Thiel
P Twnshp Officer Donald Vosburg
P Twnshp Officer Josephine Voss
P Twnshp Officer Beverly Walstead
P Twnshp Officer Allen Weber
P Twnshp Officer Connie White
P Twnshp Officer Anita Woodbury
P Twnshp Officer Renee Zimbelman
P Western Governors Association
P Wild Rice SCD

Organizations

- 4 Corners Wildlife Club
- Agassiz Env. Ed Committee
- Alice Wildlife Inc.
- American Birding Association
- Barnes Co Wildlife Federation
- Bluestem Co.
- Board Grazing Committee
- CARE - Washington, D.C.
- Cass Co Wildlife Club
- Cogswell Gun Club
- Crookston Gun Club
- Cure
- Dakota Resource Council
- Dakota Wildlife Trust
- Defenders of Wildlife
- Delta Waterfowl
- Dickey Co Wildlife Federation
- Ducks Unlimited
- Environmental Defense Fund
- Fargo Area Sportsmen
- Ft Ransom Sportsmen Club
- Grand Forks Co Wildlife Fed
- International Coalition
- Izaak Walton League
- Kaste, Inc
- Keep ND Clean, Inc
- Kindred Wildlife Club
- L.A.N.D.
- Lac Qui Parle Prairie Preserve.
- Lake Region Wildlife Club
- Lewis and Clark Wildlife Club
- Ludden Sportsmen Club
- Mark Sahli
- Minn-kota Sportsmen Club
- Minnesota Deer Hunters Assoc
- MN Wildlife Federation
- MN Waterfowl Association
- MN Bow Hunters, Inc.
- MN Conservation Federation
- MN State Archery Assoc
- North American Prairies Co.
- National Audubon Society, Washington, D.C. and Fargo, ND
- National Wildlife Refuge Assoc., Colorado Springs, CO
- Native American Fish and Wildlife Society
- Nature Conservancy, MN and Washington, D.C.
- North Dakota Farm Bureau, Forman, ND
- ND Wildlife Federation
- ND Water Education Foundation
- ND Birding Association
- ND Chapter of The Wildlife Society
- ND Natural Science Society
- ND Soil and Water Conservation Society
- ND Stockmen's Association
- Nobles Co Envirn. Service
- Pheasants Forever, Ransom and Sargent Counties, and MN Chapter
- Phillips Petroleum Company
- Prairie Woods Elc
- Prairie Restorations
- Prairie Visions
- Prairie Wetlands Resource Center
- Red River Area Sportsmen
- Red River Valley Potato Growers Association
- Richland Wildlife Club
- Rutland Sportsmen Club

- Safari Club International
- Sierra Club, Fargo, ND and Washington D.C.
- Sisseton-Wahpeton Sioux Tribe
- Tewaukon Rod and Gun Club
- The Conservation Fund
- The International Coalition
- The Nature Conservancy, Bismarck, ND and Minnesota
- The Prairie Is My Garden
- Trumpeter Swan Society
- Trust For Public Land
- TWS - Central Mountain and Plains Society
- Wetlands Trust
- Wilderness Society
- Wildlife Forever
- Wildlife Forever
- Wildlife Management Institute
- Wildlife of America

Newspapers, Radio, TV

- Bird Dog News
- Daily News
- Detroit Lakes Tribune
- Enderlin Independent
- Fargo Forum
- Fergus Falls Daily Journal
- Fertile Journal
- Flickertails
- Gun Dog News
- Hawley Herald
- KBMW Radio
- KCCM MN Public Radio
- KDDR Radio
- KDSU Radio
- KFGO Radio
- KFNW Radio
- KOVC Radio
- KQDJ Radio
- KQLX Radio
- KQWB Radio
- KSJB Radio
- KTHI-TV
- KXJB-TV
- Lake Park Journal
- MN Ornithologist's Newsletter
- Morris Sun and Tribune
- Northland Outdoors
- Oakes Times
- Outdoor News
- Ransom County Gazette
- Richland County News
- Sportsman's News
- St Paul Pioneer Press
- Star Tribune
- The Teller
- Tony Dean Outdoors
- WDAY Radio
- WDAY-TV

Schools/ Universities

- Enderlin Public School
- Fairmount Public School
- Hankinson Public School
- Institute for Policy Research
- Kindred Public School
- Lidgerwood Public School
- Lisbon Public School
- Milnor Public School
- Minot State University
- North Sargent Public School
- North Dakota State University
- Sargent Central School
- Sheldon Public School
- South Dakota State University
- Southwest State University
- St John's School
- University of Minnesota
- University of North Dakota
- Wahpeton High School
- West Fargo Middle School
- Wyndmere Public School
- Zimmerman Grade School

Individuals

Richard Anderson
Elvoy Askerooth
Mark Askerooth
Bruce Atterberg
Roland Barvels
Wayne Beyer
Richard Biewer
George Bishoff
Karen Blilie
David Breker
Delores Breker
Anna Busta
Kent Carpenter
Brendan Ciesynski
Lysle Coleman
Don Dathe
James Diekman
Roger Dienert
Greg Donaldson
Steven Dunn
Lee Dusek
Terry Dusek
Michael Dwyer
Patrick Freeberg
Phillip Freeman
Louie Gaukler
Coletta German
Tawny Gilles
Randy Gjestuang
Janet Green
Randall and Collin Greenley
Jerry Haahr
Dan Hare
Brittany Hasbargen
Charles Haus
Warren Henderson
Dale Henry
Betty Hewitt
Geddy Hicks
Andy Hoflen
Quentin Hoistad
Ray Holcomb
Alexis Holtz
Dan Jacobson
Mark Jensen
Paul Kadoun
Ron Lenzen
Paula Lewis
Mike Lindsey
William Manikowski
Jim Marquette
Wayne Mattson
Clayton McLaen
Dennis McLaen
Milton McLaen
Scott Mcleod
Darin Mille
Bill Mitchell
Norm Moody
Nick Nankivel
Ronald Narum
Richard and Janet Nelson
Roger Nelson
Danny O'Meara
David Paulson
Chris Pool
Alvah Quinn
Adam Quintanilla
Duane R. Boeder
John Remson
Thomas Robey
Wayne Robey
Al Rusch
Mark Sahli
Jack Saunders
Mark and Mary Saunders
Simon Schaefer
Lois Schuler
Steve Schumacher
Peter Siemieniewski
Matthew Solemsaas
Don Stallman
Kari Sterna
Mark Stortroen
Earl Sulerud
David Susag
Robert Washnieski
Joe Wateland
Roger and Connie White
Brian Winter
Thomas Wyum
Paul Zavada
Dave Zentner
Garth Zimbelman
Terry Zimbelman
Mike Zirnhelt

Appendix O: Glossary

Academia: pertaining to colleges or universities.

Accessible: areas and activities allowing the physical access of areas to people of different abilities especially those with physical impairments.

Adaptive Resource Management (ARM): refers to a process in which decisions are implemented within a framework of scientifically driven experiments to test predictions and assumptions inherent in the management plan. Analysis of results help managers determine whether current management should continue as is or whether is should be modified to achieve desired conditions.

Advocacy: the act or process of supporting a cause or proposal; to actively support.

Amphibians: a class of cold-blooded vertebrates including frogs, toads or salamanders.

Anadromous: fish which swim up rivers from the sea at certain seasons for breeding (i.e., salmon).

Avian Cholera: is a contagious disease resulting from infection by the bacterium *Pasteurella multocida* that affects migratory birds. High concentration of the bacteria con be found for several weeks in waters where birds die from the disease. The bacteria can be transmitted through ingestion by birds and other animals scavenging off of diseased carcasses, direct contact between birds, and by air borne particulate. (Field Manual of Wildlife Diseases, 1999-001).

Baseline: a set of critical observations or data used for comparison or a control.

Big Game: large animals sought for hunting or fishing for sport including species such as white-tailed deer, antelope, mule deer, and elk.

Biological Control: reduction in numbers or elimination of unwanted species by the introduction of natural predators, parasites or diseases.

Biomass: the total amount of living material, plants and/or animals, above and below the ground in a particular habitat or area.

Biotic: pertaining to life or living organisms; caused or produced by or comprising living organisms.

Botulism: (Avian botulism) is a often fatal disease of birds that results when they ingest toxin produced by the bacterium, *Clostridium botulinum*. The bacteria persists in spores in wetland soil and are resistant to heating and drying and can remain viable for many years. Botulism outbreaks occur during the summer and fall when air temperatures are high and decaying vegetation is present. These conditions enable the spores to germinate. The cycle for botulism starts with birds dying, maggots begin feeding on carcass, maggots with the toxic bacteria are eaten by other birds, those birds die and the cycle continues. (Field Manual of Wildlife Diseases, 1999-001).

Breeding Bird Survey (BBS): a cooperative program of the U.S. Fish and Wildlife Service and the Canadian Wildlife Service for monitoring population changes in North American breeding birds by using point counts along roads (Koford et al. 1994).

Bureau of Reclamation: a Federal government water management agency whose mission is to assist in meeting the increasing water demands of the west while protecting the environment and the public's investment in these structures. Responsible in the District for carrying out the Garrison Diversion Unit Reformulation Act of 1986 and implementing the wetland wildlife mitigation in the Kraft Slough area.

Calcareous: refers to soils with moderate to large amounts of calcium, usually calcium carbonate.

Categorical Exclusion (CE, CX, CATEX, CATX): a category of actions that do not individually or cumulatively have a significant effect of the human environment and have been found to have no such effect in procedures adopted by a Federal agency pursuant to the National Environmental Policy Act (40 CFR 1508.4)

Central Migratory Bird Flyway: migrating birds follow specific pathways in their travel from their wintering grounds to their nesting grounds. Several major pathways are evidenced by their travels. The Central flyway occurs along the great plains states.

Climax: a 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.

Colony: the nests or breeding place of a group of birds (such as herons) occupying a limited area.

Compatibility: a wildlife-dependent recreational use or any other use of a refuge that, in the sound professional judgement of the Refuge Manager, will not materially interfere with or detract from the fulfillment of the Mission of the System or the purposes of the refuge (Draft Service Manual 603 FW 3.6). A compatibility determination supports the selection of compatible uses and identified stipulations of limits necessary to ensure compatibility.

Comprehensive Conservation Plan (CCP): A document that describes the desired future conditions of the refuge; and provides long-range (15-year) guidance and management direction for the refuge manager to accomplish the purposes of the refuge, contribute to the mission of the System, and to meet other relevant mandates (Draft Service Manual 602 FW 1.5)

Cool Season Grasses: begin growth earlier in the season and often become dormant in the summer. These grasses will germinate at lower temperatures (65 to 75 ^{0}F). Examples of cool season grasses at Refuge are green needle grass, porcupine grass, intermediate wheatgrass and tall wheatgrass, smooth brome, quackgrass, and Kentucky bluegrass..

Cultural Resources: the remains of sites, structures, or objects used by people in the past.

Cultural Resource Inventory: A 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).

Data Loggers: equipment that when installed in water impoundments will be able to read the water level remotely at anytime of the year and save the data for managers to assist in carrying out the goals of the water management plan.

Defoliation: the removing of vegetative parts, to strip of leaves from animals and fire.

Dense nesting cover (DNC): a composition of grasses and forbs that allow for a dense stand of vegetation which protects nesting birds from the view of predators. Usually consists of one to two species of wheatgrass, alfalfa, and sweet clover.

Depredation: Damage inflicted upon agricultural crops or ornamental plants by wildlife.

Drawdown: the act of manipulating water levels in an impoundment to allow for the natural drying out cycle of a wetland.

Drift Prairie: an area of small, gently rolling hills, dotted with thousands of small wetlands with densities of up to 100 wetlands per square mile. It was formed by the melting and retreat of the Wisconsin glacier about 10,000 years ago.

Drift Prairie Wetland Enhancement Project: a project within the Prairie Pothole Joint Venture that includes 14 Counties in southeastern North Dakota (Barnes, Cass, Eddy, Griggs, Ransom, Richland, Sargent, Steele, Trail, and portions of Dickey, Foster, LaMoure, Stutsman, and Wells counties). Various governmental and non-governmental agencies are working together to protect, enhance, and restore wetlands and uplands. Funded by the North American Wetlands Conservation Act.

Easement Refuges: areas where easements for flowage and refuge purposes and filing of water rights were purchased. A perpetual agreement with the landowner and any successive landowners that provided the exclusive and perpetual right and easement to flood with water, and to maintain and operate an artificial lake, and/or to raise the water level of a natural lake or stream, by means of dams, dikes, fills ditches, spillways and other structures for water conservation, drought relief, and for migratory bird and wildlife conservation purposes, and/ or upon said land and waters to operate and maintain a wildlife conservation demonstration unit and a closed refuge and reservation for migratory birds and other wildlife.

Ecological Diversity: The 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 (USFWS Manual 052 FW 1.12B).

Ecosystem: a dynamic and interrelating complex of plant and animal communities and their associated non-living environment; the totality of components of all kinds that make up a particular environment (Koford et al. 1994).

Emergent: a plant rooted in shallow water and having most of the vegetative growth above water. Examples are cattail and hardstem bulrush.

Endangered Species (Federal): A plant of animal species listed under the Endangered Species Act that is in danger of extinction throughout all or a significant portion of its range.

Endangered Species (State): A plant or animal species in danger of becoming extinct of extirpated in North Dakota 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.

Environmental Assessment (EA): a concise public document, prepared in compliance with the National Environmental Policy Act, that briefly discusses the purpose and need for an action, alternative 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).

Extinction: the complete disappearance of a species from the earth; no longer existing. (Koford et al. 1994).

Extirpated: the elimination of a species from an island, local area or region (Koford et al. 1994); to destroy completely; wipe out.

Fauna: all the vertebrate and invertebrate animals of an area; the animals characteristic of a region, period or special environment.

Fen: A fen, also called an alkaline bog, is a wetland primarily composed of organic soil material (peat or muck) that take thousands of years to develop.

Feral: having escaped from domestication and become wild.

Flora: all the plant species of an area; plant or bacterial life characteristic of a region, period or special environment.

Floristic: referring to studies of the species composition of plant associations (Koford, et al. 1994); of or relating to flowers.

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 a growing season.

Fulfilling the Promises: a document that has the visions and recommendations on leadership in serving wildlife, habitat and people to fulfill the promise of America's National Wildlife Refuge System first made by President Theodore Roosevelt in 1903 to preserve wildlife and habitat for its own sake and the benefit of the American People (Fulfilling the Promise: The National Wildlife Refuge System, July 1999).

Geographic Information System (GIS): a computer system capable of storing and manipulating spatial data; a set of computer hardware and software for analyzing and displaying spatially referenced features (i.e., points, lines and polygons) with nongeographic attributes such as species and age (Koford et al. 1994).

Goal: descriptive, open-ended and often broad statements of desired future conditions that convey a purpose but do not define measurable units (Draft Service Manual 620 FW 1.5).

Global Positioning System (GPS): a system which by using satellite telemetry can pinpoint exact locations of places on the ground.

Grassland Easements: a legal perpetual agreement between willing landowners and the Service to permanently keep land in grass for wildlife. Land covered by a grassland easement may not be cultivated. Mowing, haying and grass seed harvesting must be delayed until after July 15 of each year. Grazing is not restricted.

Habitat: the place or environment where a plant or animal naturally or normally lives and grows.

Habitat fragmentation: the alteration of a large habitat to create isolated patches of the original habitat that are interspersed with a variety of other habitat types (Koford, et al. 1994); the process of reducing the size and connectivity of habitat patches, making movement of individuals or genetic information between parcels difficult or impossible.

Habitat and Population Evaluation Team (HAPET): a team of Service scientists who with GIS and research data devised the Thunderstorm Map which indicates the areas preferred by mating and nesting ducks in the Prairie Pothole Region. This map is used to focus management efforts, restoration efforts and protection efforts in the area.

Herbivory: an animal feeding on plants

Holistically: ecology views humans and the environment as a single system; relating to or concerned with wholes or with complete systems rather than with the analysis of, treatment of, or dissection into parts.

Impoundment: A body of water created by collection and confinement within a series of levees or dikes thus creating separate management units although not always independent of one another.

Incompatible: any use (recreational or nonrecreational) of a refuge that, in the sound professional judgement of the Director of the Service, **will** materially interfere with or detract from the fulfillment of the Mission of the System or the purposes of the refuge. Incompatible uses are not allowed to occur on Service areas.

Indicator species: A species of plant or animal that is assumed to be sensitive to habitat changes and represents the needs of a larger group of species.

Interseeding:: a technique of planting in which seed is sowed directly into an existing turf. It protects the valuable soil resource and also promotes less competition from weed species that would invade in a plow seeding operation.

Introduced species: a species present in an area due to deliberate release by humans (including re-introductions, transplants, and restocked species) or due to accidental release through escape or indirect assistance (Koford et al. 1994).

Inviolate Sanctuary: A place of refuge or protection where animals and birds may not be hunted.

Lacustrine: relating to, formed in, living in, or growing in lakes.

Lek: an assembly area where animals (such as the sharptail grouse) carry on breeding and courtship behavior.

Mayfield method: a method used to calculate the rate of nesting success based on the number of days that a nest was under observation (i.e., nest days of “exposure”); developed by Mayfield in 1975(Koford et al. 1994).

Maintenance Management System (MMS): a national database which contains the unfunded maintenance needs of each refuge. Projects included are those required to maintain existing equipment, buildings and to correct safety deficiencies for the implementation of approved plans, and meet goals, objectives, and legal mandates.

Mechanical Control: reduction in numbers or elimination of unwanted species through the use of mechanical equipment such as mowers, clippers etc.

Mesic: characterized by, relating to or requiring a moderate amount of moisture; having a moderate rainfall.

Migration: regular, extensive, seasonal movements of birds between their breeding regions and their "wintering" regions (Koford et al. 1994); to pass usually periodically from one region or climate to another for feeding or breeding.

Migratory birds: birds which follow a seasonal movement from their breeding grounds to their "wintering" grounds. Waterfowl, shorebirds, raptors, and song birds are all migratory birds.

Migratory Bird Hunting and Conservation Stamp Act: Authorized the requirement of an annual stamp for the hunting of waterfowl whose proceeds go towards the purchase of habitat for waterfowl and other wildlife. Duck stamps are also purchased for entry into some refuges, by conservationist and for stamp collections.

Migratory Bird Treaty Act: Designates the protection of migratory birds as a Federal responsibility. This Act enables the setting of seasons, and other regulations including the closing of areas, Federal or nonfederal, to the hunting of migratory birds.

Mississippi Migratory Bird Flyway: migrating birds follow specific pathways in their travel from their wintering grounds to their nesting grounds. The Mississippi flyway where birds follow the general path of the Mississippi River.

Mitigation: measures designed to counteract environmental impacts or to make impacts less severe.

Mixed-grass Prairie: a transition zone between the tallgrass prairie and the shortgrass prairie dominated by grasses of medium height that are approximately two to four feet tall. Soils are not as rich as the tallgrass prairie and moisture levels are less. This causes changes in the vegetative composition and plants characteristic of this area include little bluestem, Junegrass and needlegrasses.

Monitoring: the process of collection information to track changes of selected parameters over time.

National Environmental Policy Act of 1969 (NEPA): 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 NEPA with other planning requirements, and prepare appropriate NEPA documents to facilitate better environmental decision making (from 40 CFR 1500).

National Wildlife Refuge (NWR): a designated area of land, water, or an interest in land or water within the National Wildlife Refuge System.

National Wildlife Refuge System (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 protections and conservation of fish and wildlife that are threatened with extinction, wildlife ranges, game ranges, wildlife management areas, or waterfowl production areas.

National Wildlife Refuge System Improvement Act of 1997: Sets the mission and administrative policy for all refuges in the National Wildlife Refuge System. Clearly defines a unifying mission for the Refuge System; establishes the legitimacy and appropriateness of the six priority public uses (hunting, fishing, wildlife observation and photography, and environmental education and interpretation); establishes a formal process for determining compatibility; establishes the responsibilities of the Secretary of the Interior for managing and protecting the System; and 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 which are part of the original plant and animals of an area. In general, meaning from the same continent (Johnson and Larson, 1999).

Necrotic Enteritis: Necrotic enteritis has occurred on highly alkaline lakes and wetlands where sodium, magnesium, and sulfate levels have been relatively high. The bacteria that causes necrotic enteritis is normally found in nonlethal amounts in intestines of healthy animals. It is believed that abrupt dietary changes, stress, infections from other diseases, and bacterial imbalances could be the reason this bacteria is suddenly produced at higher rate causing death. In southern Canada, geese can die soon after their arrival following their diet change from grass in northern regions to grain. These birds are also using alkaline bodies of water which seems to upset the normal bacterial balance.

Neotropical Migrant: a bird species that breeds north of the United States and Mexican border and winters primarily south of this border.

ND Natural Heritage Program: A State program administered by the ND Parks and Recreation Department. The Natural Heritage Program will protect and preserve elements of North Dakota's natural heritage on private and public lands, for the benefit of present and future generations before such areas are destroyed.

North American Waterfowl Management Plan (NAWMP): the 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. Tewaukon Complex falls into the Prairie Pothole Joint Venture.

North American Wetland Conservation Act (NAWCA): an act to conserve North American wetland ecosystems and waterfowl and the other migratory birds and fish and wildlife that depend upon such habitats. The act established a council to review project proposals and provided funding for the projects. This act was passed to further implement the North American Waterfowl Management Plan and included Canada, Mexico, and the United States.

Objective: An objective is a concise target statement of what will be achieved, how much will be achieved, when and where it will be achieved, and who is responsible for the work. Objectives are derived from goals and provide the basis for determining management strategies. (Draft Service Manual 602 FW 1.5).

Parasitism: an intimate association between species of two or more kinds, one in which a parasite obtains benefits from a host which it usually injures.

Partners in Flight: a Western Hemisphere program designed to conserve neotropical migratory birds and officially endorsed by numerous Federal and State agencies and nongovernment organizations; also known as the Neotropical Migratory Bird Conservation Program (Koford et al. 1994).

Patch: a part or area distinct from that around it; area distinguished from their surroundings by environmental conditions.

Perennial: plants which live for three years or more (Johnson and Larson 1999).

Prairie Pothole Region: an area rich in natural depressions that capture precious water in a relatively dry prairie landscape which provides the most productive breeding habitat in North America for waterfowl and many other birds. Covers portions of Iowa, Minnesota, Montana, North Dakota, South Dakota, Alberta, Saskatchewan, and Manitoba.

Predation: a mode of life in which food is primarily obtained by the killing or consuming of animals.

Preferred Alternative: this is the alternative determined to best achieve the Refuge purpose, vision, and goals; contributes to the Refuge System mission, addresses the significant issues; and is consistent with principles of sound fish and wildlife management.

Prescribed Burning: Controlled application of fire to the landscape that allows the fire to be confined to a predetermined area while producing the intensity of heat and rate of spread required to achieve planned management objectives.

Priority Public Uses: six uses authorized by the Improvement Act to have priority and are found to be compatible with the refuge purposes. This includes hunting, fishing, wildlife observation and photography, environmental education, and interpretation

Raptor: a carnivorous bird (as a hawk, falcon, or vulture) that feeds wholly or chiefly on meat taken by hunting or on carrion (dead carcases).

Refuge Operating Needs System (RONS): a national database which contains the unfunded operational needs of each refuge. Projects included are those required to implement approved plans, and meet goals, objectives, and legal mandates.

Resident species: a species inhabiting a given locality throughout the year, nonmigratory species. Examples include white-tailed deer, sharp-tailed grouse, muskrat, raccoon, mink, and fox.

Riffle: a shallow, extending across the bed of a river; also a rapid; to form, flow over, or move in riffles.

Riparian: refers to areas adjacent to water; influenced by water associated with streams or rivers.

Rough Fish: a fish that is neither a sport fish nor an important food for sport fishes (i.e., carp).

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

Sediments: material deposited by water, wind, or glaciers.

Shelterbelts: single to multiple rows of trees and/or shrubs planted around cropland or buildings to block or slow down the wind.

Shorebird: any of a suborder (Charadrii) of birds (as a plover or snipe) that frequent the seashore or mud flat areas.

Spatial: relating to, occupying, or having the character of space.

Special Use Permit: a 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 (Refuge Manual 5 RM 17.6)

Species of Concern (Federal): species which are (1) documented or apparent population declines, (2) small or restricted populations, or (3) dependence on restricted or vulnerable habitats.

Species Richness: the absolute number of species in an assemblage or community; the number of species in a given area (Koford et al. 1994).

Stakeholder: a person who has an interest in activities of the Complex.

Strategy: a specific action, tool or technique or combination of actions, tools and techniques used to meet unit objectives (Draft Service Manual 602 FW 1.5).

Tallgrass Prairie: a habitat zone dominated by grasses of tall height that are approximately four to eight feet tall. Soils are rich and precipitation is the more than in any other prairie area. The vegetative composition and plants characteristic of this area include big bluestem, Indian grass, prairie cordgrass, switchgrass, and needlegrasses.

Tewaukon National Wildlife Refuge Complex (Complex): a management unit of the Service that is located in the Southeast corner of North Dakota (see Map 1). The Complex encompasses the Refuge including the Sprague Lake Unit, the Storm Lake Easement Refuge, the Wild Rice Easement Refuge and the Tewaukon Wetland Management District (WMD).

Threatened Species (Federal): Species listed under the Endangered Species Act that are likely to become endangered within the foreseeable future throughout all or a significant portion of their range.

Threatened Species (State): a plant or animal species likely to become endangered in North Dakota within the near future if factors contributing to population decline or habitat degradation or loss continue.

Thunderstorm Map: a map which depicts areas (wetland complexes) that are preferred by mating and nesting ducks in the Prairie Pothole Region. This map is used to focus management efforts, restoration efforts, and protection efforts in the area.

Till: unstratified glacial drift consisting of clay, sand, gravel, and boulders intermingled.

Turbidity: the cloudy condition of a water body caused by suspended silt, mud, pollutants, or algae.

U.S. Fish and Wildlife Service (Service, FWS): the 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 comprised of more than 500 national wildlife refuges and thousands of waterfowl production areas. It also operates 65 national fish hatcheries and 78 ecological service field station, 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 which distributes of millions of dollars in excise taxes on fishing and hunting equipment to State wildlife agencies.

U.S. Geological Survey: a Federal government 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.

Visual Obscurity: a measurement of the density of a plant community; the height of vegetation that blocks the view of predators to a nest.

Wading Birds: birds that have long legs that enable them to wade in shallow water. Includes egrets, great blue herons, black crowned night heron, and bitterns.

Warm Season Grasses: begin growth later in the season (early June). These grasses require warmer soil temperatures to germinate and actively grow when temperatures range from approximately 85 to 95^0F. Examples of warm season grasses are switchgrass, big bluestem, Indian grass, little bluestem, and tall wheatgrass.

Waterfowl Production Areas (WPA): prairie wetlands with associated uplands managed to provide nesting areas for waterfowl and owned in fee title by the Service. These lands are purchased from willing sellers with funds from Duck Stamp sales. They are open to public hunting, fishing, and trapping according to State and Federal regulations.

Waterfowl: Includes ducks, geese, and swans.

Watershed: the region or area draining into a river, river system, or body of water.

Western Hemisphere Shorebird Reserve Network (WHSRN): consists of wildlife agencies, scientists, private conservation groups, and governments who endeavor to preserve and manage wetland habitat on a hemispheric scale to aid shorebird survival.

Wetland Easements: a 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): an area covering several Counties that acquires (with Federal Duck Stamp funds), restores, and manages prairie wetland habitat critical to waterfowl and other wetland birds. The Tewaukon Management District covers the Counties of Ransom, Richland, and Sargent.

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Wild Tiger Lily with Porcupine Grass, Herbert Troester, USFWS