

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 to provide a logical step-down from the broad purpose and vision statements to management decisions. The CCP represents a course of action felt to best meet Complex goals and objectives. Implementation of the CCP 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 Units

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.

Tewaukon National Wildlife Refuge (See Map 5 and 6)

Purpose

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

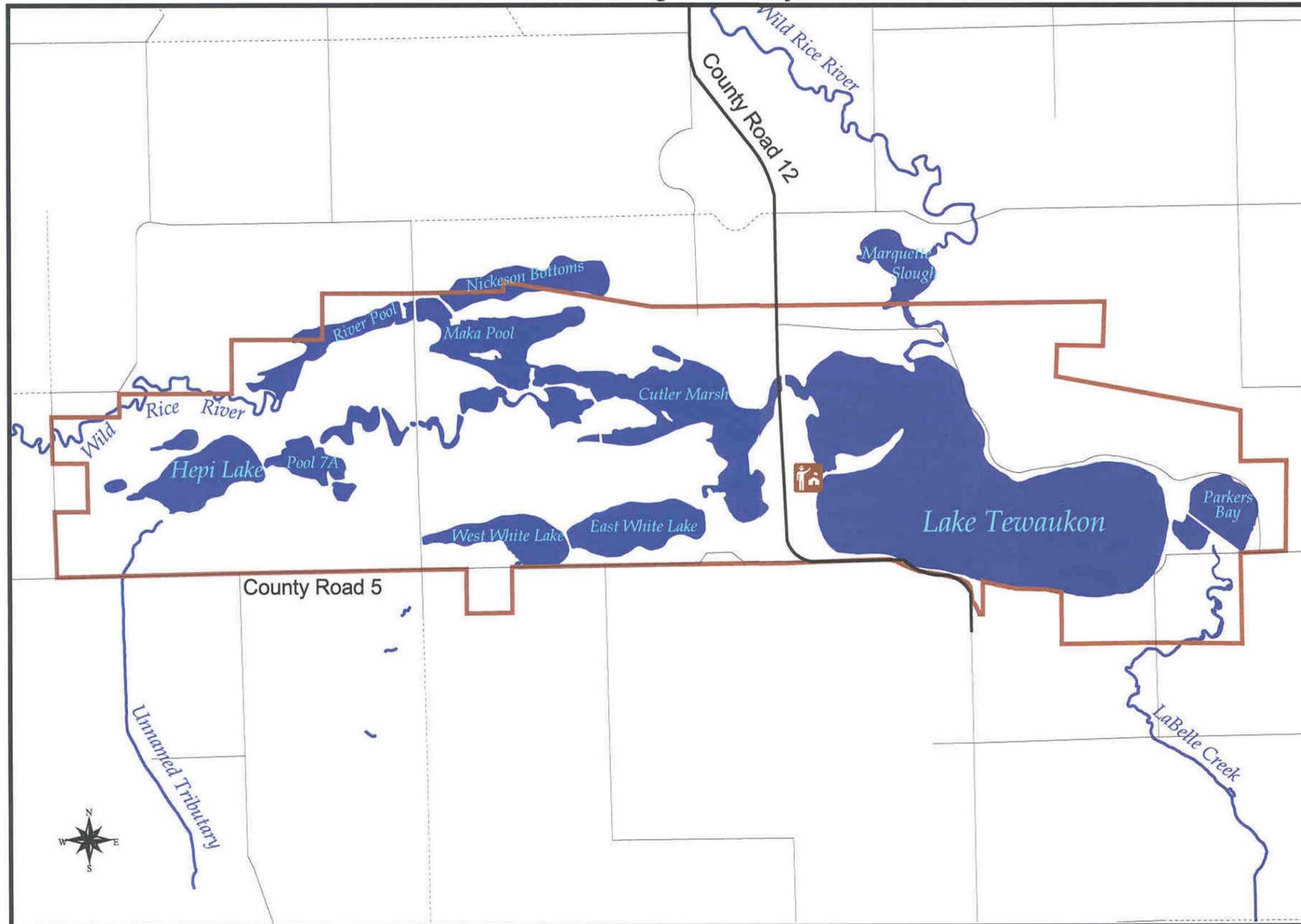
- For Refuge lands acquired under the Executive Order 9337, dated April 24, 1943, the purpose of the acquisition is to reserve and set apart certain public lands for the use of the Department of the Interior.
- For Refuge lands acquired under Public Land Order 286, dated June 26, 1945, the purpose of 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.

Tewaukon Unit

Sargent County, North Dakota



Legend

- Refuge Boundary
- Managed Wetlands
- Rivers and Streams
- Refuge Headquarters

Road Types

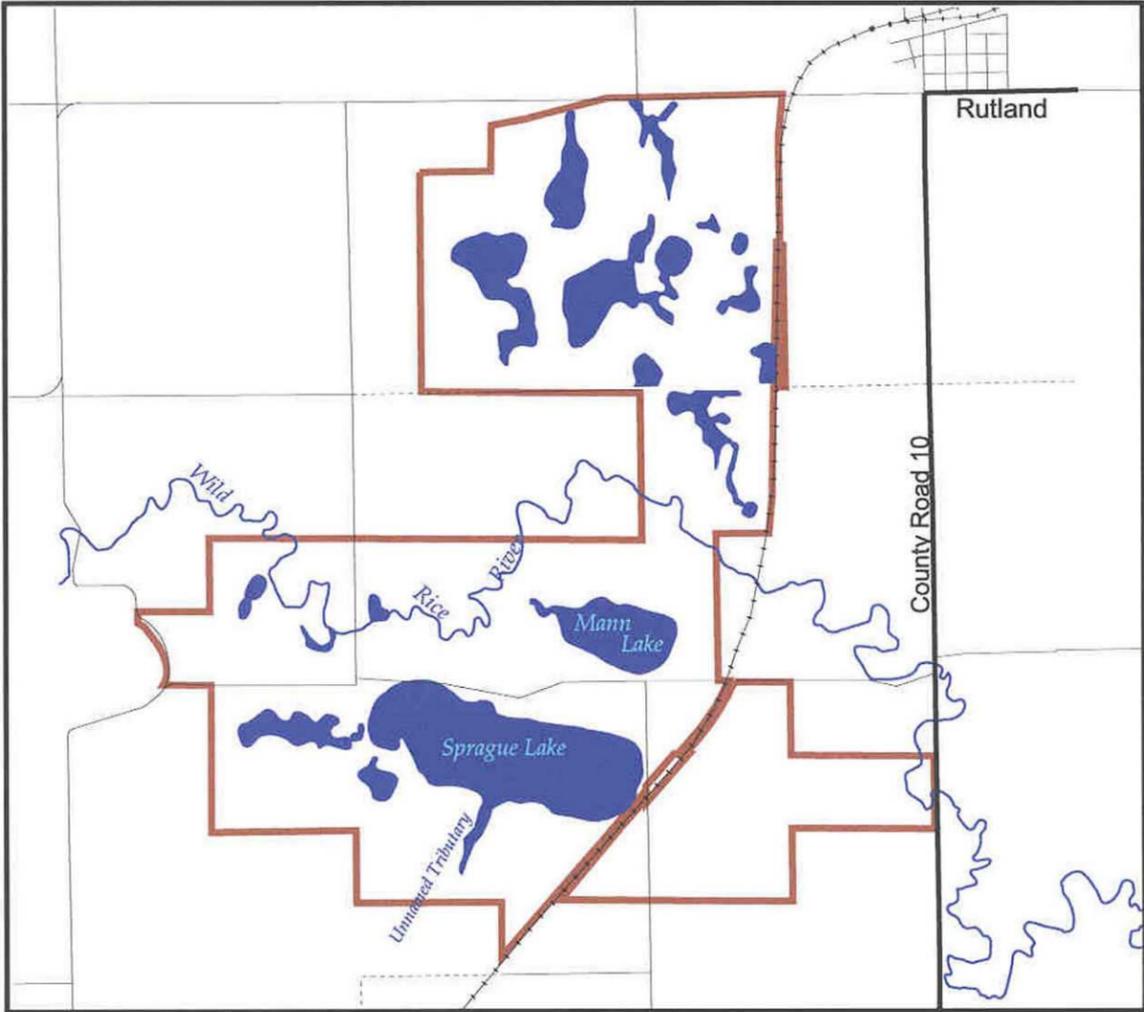
- Gravel
- Limited Access Trail
- Paved



Map #5 Refuge Map - Tewaukon Unit

Sprague Lake Unit

Sargent County, North Dakota



1 0 1 Miles

Legend

	Limited Access Trail		Refuge Boundary
	Gravel		Managed Wetlands
	Paved		Rivers and Streams
	Railroad		



Map #6 Refuge Map - Sprague Lake Unit

Habitat Management

Wildlife species are intimately tied to the landscape. The food, water, shelter, and space that are provided on Refuge lands determine what wildlife species use those lands. Diverse habitats support diverse wildlife populations.

R1 Goal: Preserve, restore, and enhance the ecological diversity of native flora, other grasslands and wetlands within the tallgrass prairie ecosystem.

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).

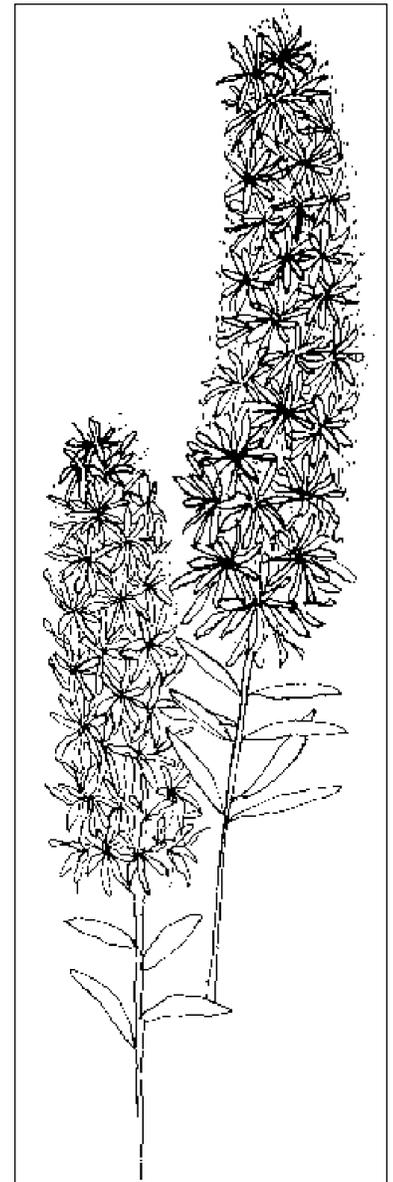
The tallgrass prairie ecosystem had frequent disturbances. Wildfires, caused by natural events like lightning strikes, burned the prairie at a frequency that varied widely but was estimated to be every two to five years (Axelrod 1985, Bragg 1982, Bragg and Hulbert 1976). Lightning was the primary cause 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, and prairie cordgrass. Common cool season grasses included western wheatgrass, porcupine grass, needle-and-thread, June grass, and green needlegrass. 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 Heidel's 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.

"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 Sibley, 1863 on an expedition through North Dakota



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 needlegrass, 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 sides 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 needlegrass, 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, Central, Dry Mesic Tallgrass, and Mesic Mixed-Grass 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 1970s to the present time and limited haying. Little to no grazing has occurred on these areas.

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.

R1.1 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.

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 Tewauckon 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. Only one site (North Pool 2) has a tree row that may be removed after monitoring and site evaluation are done. 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.

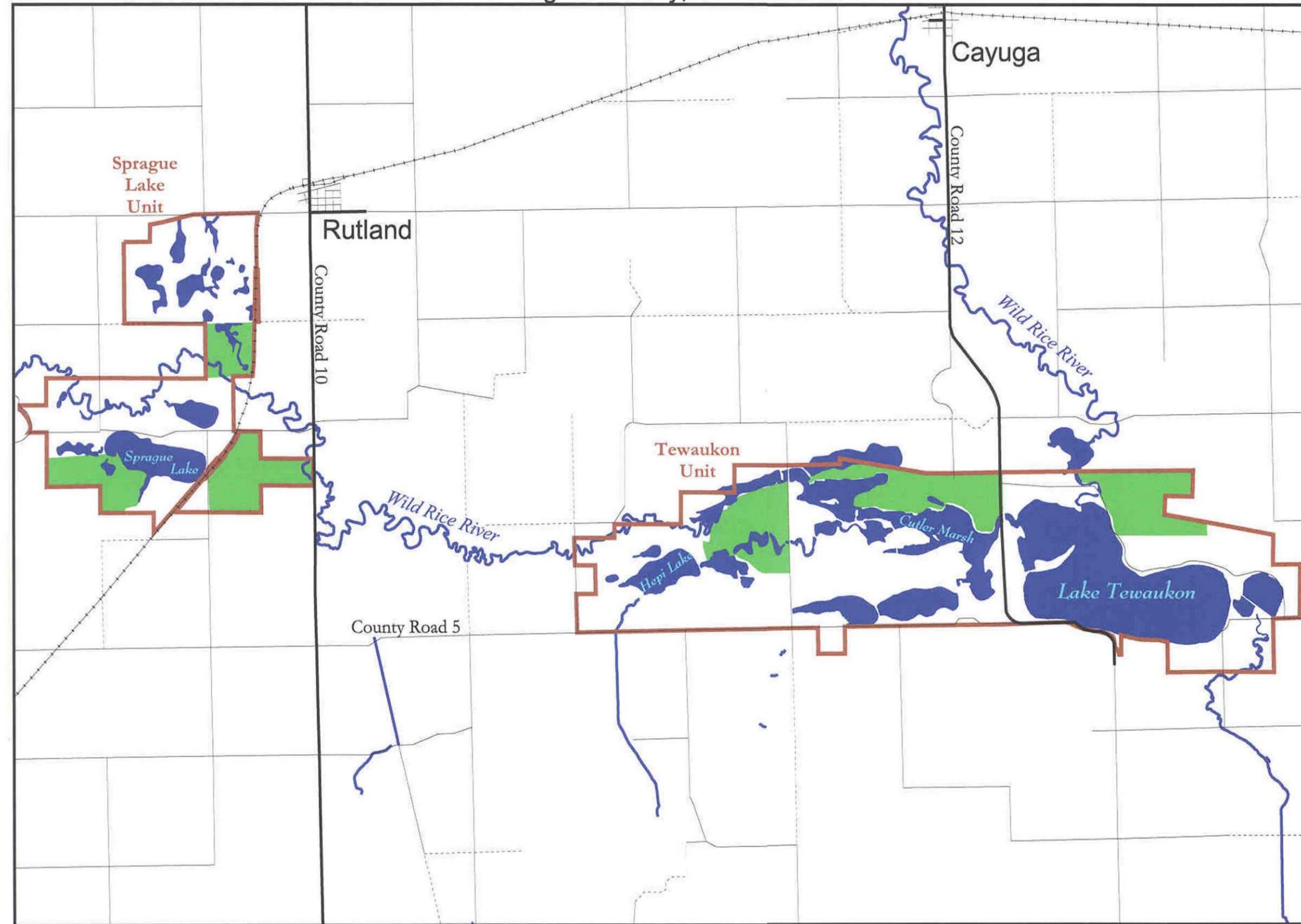
R1.2 Objective: Manage the six Prairie Focus Areas (South Pool 4, Krause, North Pool 2, Southwest Sprague Lake, NE 1/4 Section 36, and Southeast of Railroad tracks - See Map 7): 1) to achieve an area of contiguous grassland (greater or equal to 160 acres) that is greater than 50 meters from woody vegetation (greater than one meter tall); 2) contain a variety of vegetative heights on the area with 20 percent in each of the following categories: 0 to 10 cm; 10 to 20 cm; 20 to 30 cm; 30 to 60 cm; greater than 60 cm; 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.

Tewaukon National Wildlife Refuge

Sargent County, North Dakota



Legend

- Prairie focus Areas
(Total of 1,594 Acres)
- Managed Wetlands
- Rivers and Streams
- Road Types**
- Limited Access Trail
- Gravel
- Paved
- Railroad



Map #7 Six Prairie Focus Areas

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.

R1.3 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, farming, grazing or interseeding) as appropriate to maintain optimal nesting habitat for ground nesting ducks.

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 lacking vegetative structural 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. A total of 600 acres of planted cover would be converted to a diverse native floral community which involves intensive management. This acreage total includes sites in the six Prairie Focus Areas.

R1.4 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.

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 and wildlife species.

"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.

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 baths 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 Heki (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, pool outlet 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. This diversity of wetland stages will meet the needs of a variety of wildlife species.

R1.5 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 Lake Tewaukon and Sprague Lake as open water habitats for migratory waterfowl rest areas.

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.

R1.6 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 this 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 NWR 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 a variety of cooperative private land agreements 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.

R1.7 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 Fish and 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).

R1.8 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.

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.

R1.9 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.

Strategy:

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

Nonnative Plant Management On the Complex

Several nonnative plant species exist on Complex lands and waters and are listed below:

Grasslands:

Leafy spurge
Canada thistle
Musk thistle
Bull thistle
Kentucky bluegrass
Smooth brome
Yellow and white sweetclover
Russian olive trees

Wetlands:

Reed canary grass
Canada thistle
Kentucky bluegrass
Smooth brome

Watch Species:

Purple loosestrife (sighted in several locations on private land in the District)

All of these nonnative plants were intentionally or accidentally brought over to the United States from other countries. Without their natural control agents, these plants began to aggressively invade many of this country's native habitats. These nonnative plant species can out-compete native plant species or other desired plant species when frequent disturbances (grazing and burning) and nonnative plant control methods are not conducted. The Complex staff uses a multi-faceted approach to nonnative plant control termed Integrated Pest Management (IPM). This approach to the control of pests (nonnative plants in this case) utilizes a practical, economical, and scientifically based combination of biological, mechanical, and chemical control methods. Many of these nonnative plant species are very aggressive, and relying on only one control method is usually not effective. A combination of methods has been proven to increase effective control over these plants. Nonnative plant species can crowd out the native or desirable flora making the grasslands or wetlands unattractive to many species of wildlife. For example, uniform grasslands that are comprised primarily of smooth brome and Kentucky bluegrass provide little in the way of nesting cover for ground nesting birds and very poor cover in the winter.

Complex staff spend a considerable amount of time and funds on nonnative plant control. In 1999, over \$20,000 dollars (labor and chemical costs) were spent on leafy spurge, Canada thistle, musk thistle, and bull thistle alone. Control of these four plant species will continue to be a top priority on Complex lands. Russian olive tree control also received more attention on the Complex (Refuge and Hartleben WPA) for the past five years. Several methods were tried until a time efficient and effective treatment was developed. Over 2,000 Russian olive trees have been chemically treated on the Hartleben WPA and Refuge to date. Control of the other nonnative species (smooth brome, Kentucky bluegrass, and sweetclover) is currently managed with prescribed burning. More effort and methods will need to be used in the future to control these two nonnative grass species and sweetclover.

R1.10 Objective: Reduce by 15 percent (measured as canopy cover) nonnative plants on Complex lands and waters.

Strategies:

- ✓ Annually evaluate fields through visual observations and continue to aggressively manage highly invasive nonnative species focusing on Canada, musk and bull thistle and leafy spurge.
- ✓ Use a variety of techniques and tools including: chemical, mechanical, and biological methods, prescribed burning and grazing to control nonnative plants.
- ✓ Continue to evaluate nonnative control methods for effectiveness and gather information on methods developed in the future.
- ✓ Monitor Complex for additional nonnative plant species and control new invasions before they become a large problem.
- ✓ Document and coordinate with the County Weed Board and State to control nonnative plant species on and off Service lands.

Prescribed Burning and Wildfires

The primary reason the remaining native prairie is not in better condition is the lack of periodic disturbance (Service Ecological Services Botanist, Kathy Martin 1993; Barbour et al. 1987; Duebber 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 was important for prairie plant health and maintained 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 (Duebber 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 1960s, 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 and more cost effective 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. Proper planning, training, and equipment reduces the risk of this management tool.

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.

R1.11 Objective: Utilize prescribed fire, in an ecosystem management context, applied in a scientific way under selected weather and environmental conditions, on approximately 5,000 acres of grasslands and 200 acres of wetlands annually on the Complex 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.

R1.12 Objective: Protect life, property, and other resources from wildfire by safely suppressing all wildfires on Complex lands and adjacent private 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.

Wildlife

R.2 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 Refuge grasslands 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 1900s. Restoration of giant Canada goose populations began in the 1930s with considerable effort made in the 1960s to 1970s (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 1970s to levels that yield 10 to 15 area crop depredation complaints per year.

Waterfowl Nesting

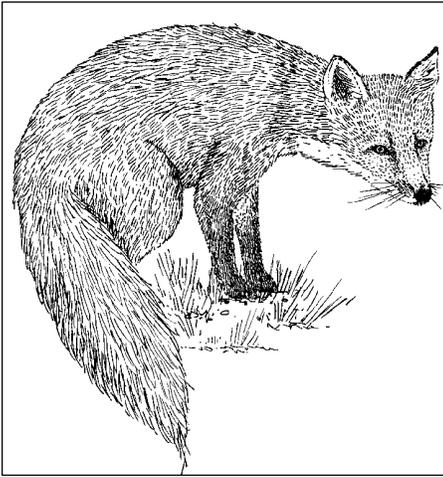
The Refuge is surrounded by intense agricultural use, that severely alters the landscape. The Refuge provides the majority of quality waterfowl upland nesting habitat in the area. The Conservation Reserve Program (CRP) has greatly increased grassland cover throughout the Complex in the past 10 years. However, the continued presence of this cover on the landscape depends on funding for this U.S. Department of Agriculture program. As grasslands are fragmented and tracts become smaller, nesting ducks become more vulnerable to predation. Predation has been identified as a principal cause of nest loss (Sargeant and Raveling 1992). 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 (Sargeant et al. 1984). Large tracts of thick residual cover require more effort for predators to search. At the Refuge, the major predators on ducks and duck eggs include: red fox, striped skunk, raccoon, mink, and Franklin's ground squirrel. (See Land Use and Wildlife Species Changes Section for more discussion.) 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 (Sargeant 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 records 1990-1998). 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).

"Refuges Are Places Where Wildlife Comes First."

- U.S. Fish and Wildlife Service - Fulfilling the Promise, 1999

"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*



Fox, Cindie Brunner

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.

To develop the next objective, the planning team considered the 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; and 4) Service policy and implementation guidelines for management of predators to benefit breeding waterfowl on Service lands. A nesting success of 30 percent (Mayfield) was chosen because it maintains stable Refuge duck populations and contributes to the overall duck population.

R2.1 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.
- ✓ Maintain existing predator enclosure fences and continue to monitor to determine duck nesting success.

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). 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 a consistent 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 200 to 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.

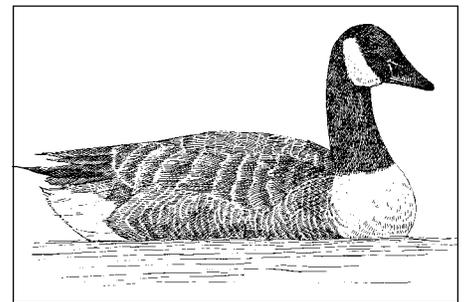
Refuge cropland food sources can also be linked to two waterfowl overpopulation concerns. Though the overall contribution of Tewaukon Refuge crop fields to the growth of mid-continent snow goose numbers is minimal, the availability of grain food sources has been linked to improved snow goose survival 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, row, and hay 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.

R2.2 Objective: Maintain no more than 135 acres of cropland as a Refuge share to provide green browse and millet/corn for migratory waterfowl.

Strategy:

- ✓ 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.



Canada Goose, Cindie Brunner

"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*

Migratory Birds

The Refuge was established as a refuge and breeding ground for migratory birds (See Appendix A for a list of wildlife 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 highly productive 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.

Shorebirds

Thirty-seven species of shorebirds including 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 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. The variety of wetland stages described in the Refuge Wetlands Section will provide habitat for shorebirds.

Wading Birds

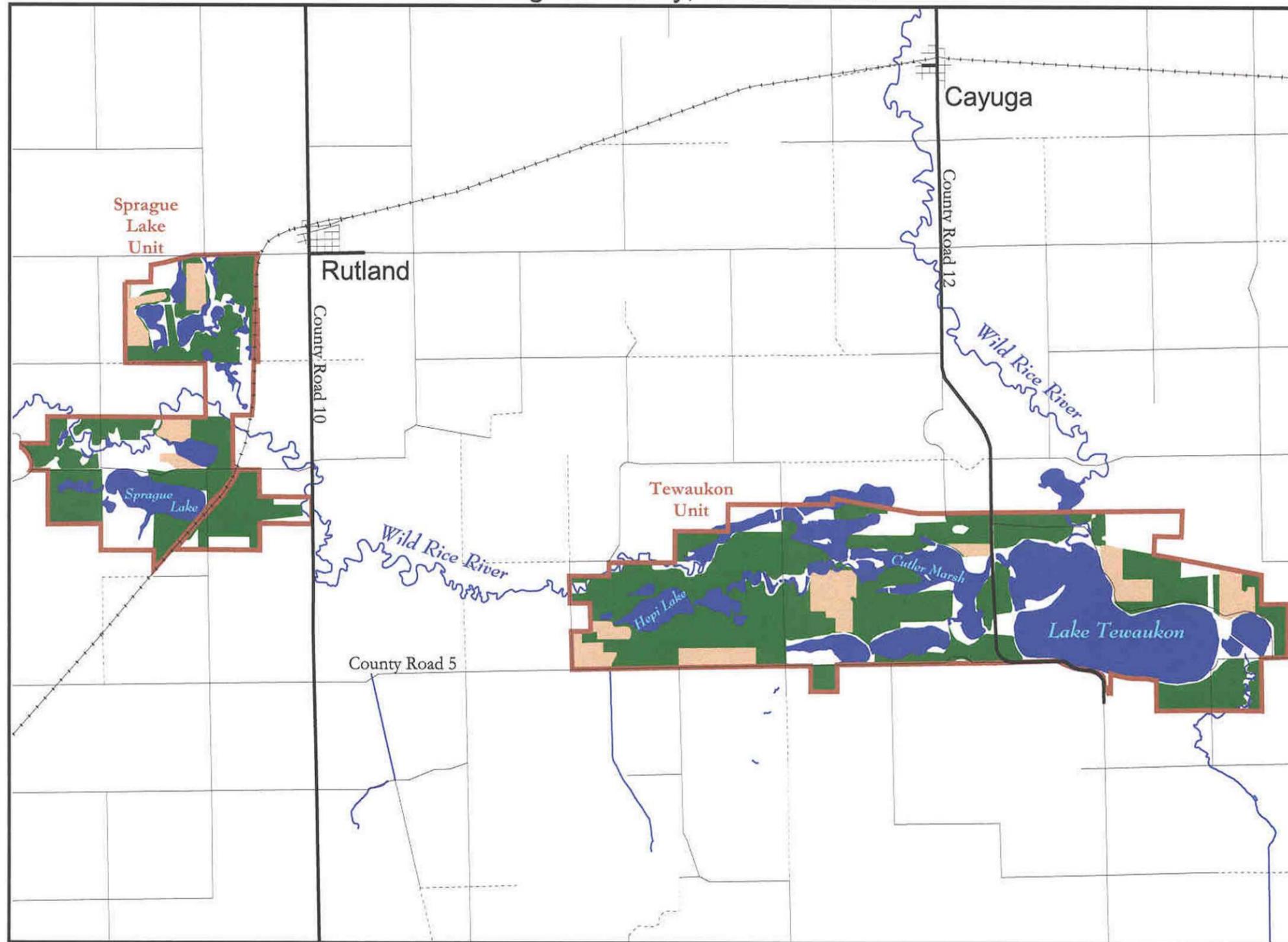
Like shorebirds, the number of wading birds (herons, egrets, rails, bitterns) breeding on the Refuge fluctuates with the availability of water. A heron colony has existed on the Refuge since 1993 when water returned to the southeastern North Dakota. Great blue herons, great egrets, double-crested cormorants, 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. The variety of wetland stages described in the Refuge Wetlands Section will provide habitat for these species.

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. In the year 2000, an increase in short-eared owls nesting on the Refuge was observed. 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 Tewauckon and Sprague Lake. The variety of grassland, wetland, and woodland habitats on the Refuge will continue to provide habitat for these species.

Tewaukon National Wildlife Refuge

Sargent County, North Dakota



Legend

- Historic Cropland**
(Planted to Grassland Cover)
(Total of 3,088 Acres)
- Current Cropland**
(Total of 615 Acres)
- Managed Wetlands**
- Rivers and Streams**

Road Types

- Limited Access Trail
- Gravel
- Paved
- Railroad





Map #8 Cropland Past and Present

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). Maintaining native woody vegetation as described under the Refuge Native Woodlands Section will provide habitat for woodland dependent species.

The following objective was 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.

R2.3 Objective: Initiate a baseline breeding bird survey on the Refuge to monitor local breeding migratory bird population changes over time.

Strategy:

- ✓ Conduct point count surveys.

Grassland Migratory Birds

Herkert (1995) looked at the data from the North American Breeding Bird Survey between 1966 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 Native Prairie Section for more discussion on grassland migratory bird habitat.

R2.4 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.

Strategy:

- ✓ 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.



Meadowlark, Cindie Brunner

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 dropped quickly due to a failure 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 and reduces the spread of the disease.

R2.5 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 management 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 to 300 white-tailed deer winter on the Refuge, taking advantage of shelterbelts, croplands, and other habitats. 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.

R2.6 Objective: Maintain an average winter deer population of no more than 250 to minimize vegetative damage on the Refuge and crop damages on adjacent lands.

Strategy:

- ✓ 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.

R2.7 Objective: Develop a specific Monitoring Plan to gather baseline information for small and medium mammal populations on the Refuge.

Birds

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. Habitat management described in the CCP is expected to sustain these populations.

Upland Game Birds

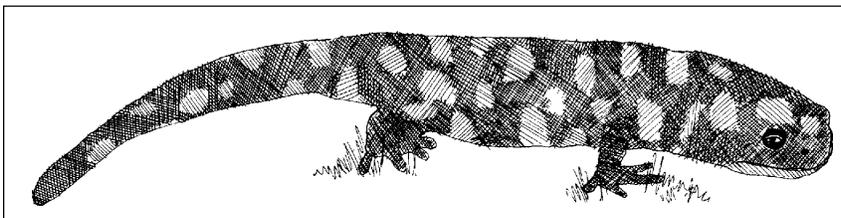
Only one species of native upland game bird, the sharp-tailed grouse, can be found on the Refuge. Sharp-tailed grouse are few in number and only spotted occasionally on the Refuge. There has been a lot of debate about the presence of greater prairie chickens which were not thought to occur in North Dakota prior to the late 1870s (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 1940s; 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). Prairie amphibians have had a longer history of decline than those from other habitats (Corn and Peterson 1996). Northern leopard frogs almost disappeared from tallgrass prairies in Wisconsin and Minnesota in the 1960s and 1970s (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, conservation, and management of prairie reptiles and amphibians has not received much attention. 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 objective.

R2.8 Objective: Develop a specific Monitoring Plan to gather baseline information for amphibian and reptile populations on the Refuge.



Tiger Salamander, Cindie Brunner

Fish

Little historical survey information has been gathered on fish populations in the Wild Rice River or in Refuge pools before 1966. Since that time, researchers, the North Dakota Game and Fish Department, the North Dakota Department of Health, North Dakota State University Department of Zoology, and the Fish and Wildlife Service have conducted fish surveys in the Wild Rice River. Copes and Tubb (1966) conducted fish surveys in the Red River tributaries including eight sampling stations scattered along the Wild Rice River. Sampling was conducted twice a month from June to September in 1965. One of the sampling stations was below Silver Lake before it entered the Sprague Lake Unit, and one was located near Cayuga downstream of the Tewaukon Unit. Northern pike, carp, fathead minnow, white sucker, black bullhead, brook stickleback, pumpkinseed, black crappie, yellow perch, and walleye were found in the Silver Lake sampling station (Copes and Tubb 1996). No fish were sampled in the Cayuga station possibly due to very turbid, low flowing, and polluted (oil) water. Farther downstream an additional two species were sampled, trout-perch and bigmouth buffalo. Transplantation (stocking) of fish, selective poisoning to maintain sport fisheries, high turbidities, water temperatures, erratic stream flow, and heavy silt loads all have some effect on fish distribution (Copes and Tubb 1966). No endangered, threatened or rare fish have been sampled on the Refuge.

The amount of habitat for native stream fish on the Refuge is limited. The Wild Rice River flows are highly variable and can limit fish movement and habitat. The four large Refuge dams on the Wild Rice River also restrict fish movement and alter natural stream habitat. The primary focus of fisheries management has been on recreational fisheries in Lake Tewaukon and Sprague Lake (for more information on recreational fishing see Refuge Public Use and Recreation Fishing Section).

Fish stocking in Lake Tewaukon and Sprague Lake for recreational fishing has probably been going on long before the Refuge was established. The Service began stocking Lake Tewaukon in 1940 and has continued to stock fish almost every year since then. The following species have been stocked by the Service in Lake Tewaukon: bluegill, black crappie, walleye, northern pike, black bullhead, largemouth bass, yellow perch, smallmouth bass, pumpkinseed, and tiger muskie. Sprague Lake has been stocked by the Service since 1978. The following species have been stocked by the Service in Sprague Lake: yellow perch, northern pike, walleye, black crappie, fathead minnow, channel catfish, and largemouth bass.

The planning team did not develop specific management objectives for native fish due to the intermittent flows of the Wild Rice River and alteration of the Wild Rice River by the four large Refuge dams. No fish introductions are planned for other Refuge wetlands because recent research indicates there is direct competition for food between fish and ducklings (Hill et al. 1987 and Giles 1994). Water quality of the Wild Rice River is addressed in the Refuge Riparian Section and Refuge Managed Wetlands Water Quality Section. Recreational fishing is addressed in the Refuge Public Use and Recreation Fishing Section.

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. The following objective was developed to address the range of options Refuge managers will use to manage these species.

R2.9 Objective: Restrict the spread of existing and additional nonnative animal species (carp, house sparrows, feral dogs and cats) that adversely impact native species.

Strategies:

- ✓ Reduce population densities of carp to maintain a total biomass of less than 30.0 kg/survey. This was recommended in the 1996 Fisheries Management Plan for Refuge waters by applying appropriate management tools including the addition of predator fish (i.e., tiger muskies), minimum size limits on predatory 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 animal species on native flora and fauna.

Other nonnative species, like the ring-necked pheasant, are not known to adversely impact Refuge native species. However, habitat management designed to benefit pheasants can adversely impact Refuge 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, the following objective guides managers to favor native grassland nesting migratory birds. Managers must also consider the establishing purpose of the Refuge for migratory birds and policy concerning native and nonnative species. A number of objectives described in this Plan, such as maintaining cropland (i.e., millet bales), increasing the density of grassland cover, and using predator control, will still provide pheasant habitat and improve their nest success.

R2.10 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.

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. Mathews (1982) listed activities in order of decreasing disturbance to waterfowl as: rapid overwater movement and loud noise (power boating, 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). During a five-year study on a refuge in southern Wisconsin, human activity (recreational, vehicle and non-vehicle activities) resulted an average of 43 percent of the ducks departing the area (Vander Zouwen 1983).

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 (Reichholz 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 affected by a variety of disturbances ranging from snowmobiles to cross-country skiers. Human caused wildlife disturbance during the winter can increase stress and can contribute to the death of wildlife.

The planning team discussed wildlife disturbance during migration, the nesting and breeding season, and the winter season. The team also discussed the pros and cons of flexible versus standard dates for opening roads in the spring, public notification through news releases, and Refuge pamphlets.

Wildlife Disturbance Closure Background

To limit disturbance to migratory water birds using Lake Tewaukon and Sprague Lake, the road around the north shore of Lake Tewaukon and the trail around the south side of Sprague Lake have been closed to vehicles beginning on October 1 for the past 10 years. Secondary considerations for closing these roads through the winter have been to limit winter wildlife disturbances (see Wintering Wildlife Habitat Section) and reduce the opportunity for visitors to get stuck in snow on these unplowed roads. The dates that these roads have been opened for public travel in the spring have varied. The Lake Tewaukon road has been re-opened for public travel when the frost is out and the road surface is dry. This reduces maintenance costs. Generally, the Lake Tewaukon road is re-opened after the main migration concentrations of migratory waterbirds have moved on. The Sprague Lake trail does not dry out quickly and is not open to public traffic until after the spring concentrations of migratory waterbirds have moved through. Peak concentrations of migratory water birds on the Refuge have historically been recorded during the second and third weeks of April. However, early spring weather and open winters like those in 1998 and 1999 have moved peak concentrations of birds on the Refuge ahead by as much as a month. Gates are used to close each of these access points.

Boat access for fishing on both lakes has historically been closed on the Friday before the opening of the general waterfowl season, but has been standardized to October 1 for the past few years. Boat traffic is permitted again on May 1.

Shore fishing from the Point is popular during the spring and fall. The Point Road on the peninsula that juts out into Lake Tewaukon has traditionally been closed to limit disturbance to the winter deer herd and has usually been closed prior to the opening of deer gun season. This date varies from year-to-year. A second consideration for closing this road is the operation of an aerator in Lake Tewaukon south of the Point, which is used to prevent winter fish kill. Lake ice is always thin above the aerator lines, and this area can be hazardous for anglers. This portion of the lake is easily accessed from the west end of the Point Road. This road is not maintained in the winter and closing it also keeps people from getting stuck in the snow during the winter. The Point Road has also been re-opened to the public in the spring when the surface is dry. In most years, it is re-opened after spring concentrations of migratory waterbirds have moved through. A wooden barricade with a sign is used to close this road.

Much of the public input we received focused on access to the Point in the fall and spring. People felt that since the Point Road provided access to such a small percentage of the lakeshore, and the remainder of the Refuge was closed to the public during waterbird migration periods, the Point Road could remain open and the Refuge would still provide adequate rest area.

Migratory Bird 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 road closures effectively limit disturbance of waterbirds to 5 percent of Lake Tewaukon and 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 also limit the amount of bird disturbance caused by wildlife observers and photographers. To limit disturbance to migrating waterbirds, the road around Lake Tewaukon and the trail around the south side of Sprague Lake will be closed to vehicles in October, November, and April. These roads will also be closed from December through March to limit winter wildlife disturbance which is discussed in the Wintering Wildlife Habitat Section. Walk-in angling access will be permitted to Lake Tewaukon (except the Point) and Sprague Lake year-round.

The Point Road will be closed to all public access (vehicles and foot traffic) if it becomes impassable due to snow conditions or on November 1 to limit winter wildlife disturbance. The staff will evaluate the disturbance to migratory waterbirds during peak migration periods for several years to determine if this road should be closed from October through April. This road could be gated, signed, and a news release can be used to notify the public.

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

R2.11 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 during the months of October, November, and April to reduce disturbance to migratory birds.
- ✓ During the primary waterbird fall migration period (October), close all hunting activities on the Refuge.
- ✓ 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 for wildlife observation and photography during migration based on activities requested and their potential impacts to migrating birds.
- ✓ Evaluate disturbance to migratory waterbirds during the peak migration months of October and April and assess migratory bird responses to vehicles and angler visits on the Point Road. Close the Point Road during the months of October and April if disturbance is significant.

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 and production.

Currently, visitor use is primarily associated with the main Refuge road around Lake Tewaukon and the area east of County Road 12. That portion of the Refuge west of County Road 12 and the Sprague Lake Unit (except for Sprague Lake) are closed to public entry from April through August. It is recognized that 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 Tewaukon 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 re-zoning of open areas or the development of established walking/observation trails can mitigate impacts that may occur.

R2.12 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 closed 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 March. Stress periods for wildlife are predominately associated with cold temperatures and snow depths which vary from year-to-year. In the winter of 1997, extreme weather, including 8 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.

Recreational pheasant hunting is permitted on the Refuge during the month of December and the beginning of January. Weather limits the number of hunters participating in this activity. If winter conditions are severe early and snow is deep, the Refuge has very few visits from pheasant hunters. Recreation during the rest of the winter is limited to ice fishing and access for ice fishing on Lake Tewaukon and Sprague Lake. 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.

R2.13 Objective: Manage the Refuge (except for ice fishing on Lake Tewaukon and Sprague Lake) as a closed area from January through March to reduce disturbance to wintering resident wildlife.

Strategies:

- ✓ Close the road around Lake Tewaukon and the trail south of Sprague Lake to vehicles from December through March to reduce disturbance to wintering wildlife. That portion of the Lake Tewaukon road from County Road 12 east to the north boat ramp access road will remain open.
- ✓ Close the Point Road if it becomes impassable due to snow conditions or on November 1 to limit disturbance to wintering deer and for ice fishing safety. The Point Road will be re-opened in the spring when conditions are dry for vehicle access.
- ✓ Limit vehicle access (including snowmobiles) 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 access for winter ice fishing on Sprague Lake to the east and west boat ramps.
- ✓ Winter hiking, snowshoeing, ice skating, cross-country skiing, and other recreational activities not associated with recreational fishing access on Lake Tewaukon and Sprague Lake 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.

Location	Closure Periods	Reason
Lake Tewaukon Road	October, November, and April December through March	Migratory Birds Wintering Wildlife
Sprague Lake Trail	October, November, and April December through March	Migratory Birds Wintering Wildlife
Point Road	When impassable or November 1 to when road is passable	Wintering Wildlife Ice Fishing Safety
Portion of Tewaukon Unit West of County Road 12	April through August January through March	Nesting and Breeding Wildlife Wintering Wildlife
Sprague Lake Unit excluding Sprague Lake	April through August January through March	Nesting and Breeding Wildlife Wintering Wildlife

Endangered Species

R3 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 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 this District since 1985.

Migratory Nongame Birds of Management Concern

In 1995, the Fish and Wildlife Service identified migratory nongame birds that were of management concern across the United States (U.S. Fish and Wildlife Service 1995). These species are of concern because of documented or apparent population declines, small or restricted populations or dependence on restricted or vulnerable habitats. The bird species that occur or may occur on the Tewaukon Refuge include: (*Nest on the Refuge)

Black tern *	Olive-sided flycatcher	Loggerhead shrike
Ferruginous hawk	Sedge wren *	Red-headed woodpecker
Northern harrier *	Baird's sparrow	Chestnut-collared longspur
Upland sandpiper *	Grasshopper sparrow *	

With the exception of the five bird species that nest on the Refuge, the other birds are seen only occasionally on the Refuge during migration. The northern harrier, upland sandpiper, and the grasshopper sparrow have been chosen as indicator species for the Tallgrass Prairie Management Approach. Population, breeding, and habitat information on these three indicator species are addressed in the Tallgrass Prairie Management Approach Section. Since little information exists about Refuge breeding populations of black terns and sedge wrens, the status of these species will best be addressed under the point count objective in the Refuge Migratory Bird Section.

Other Rare Species

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).

R3.1 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.

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

Public Use and Recreation

More than 30 million people visit national wildlife refuges every year. The vision for the future in 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.

R4 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.

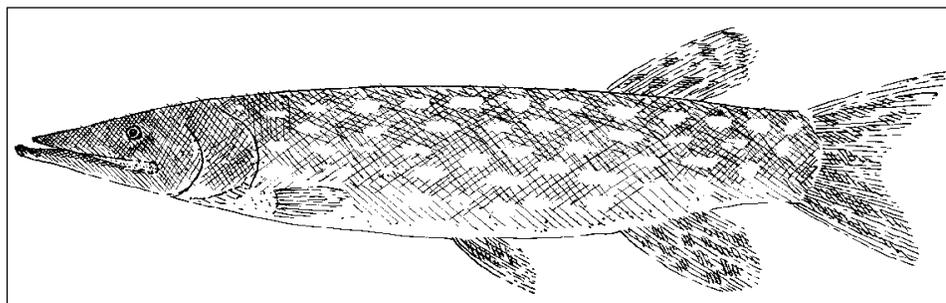
Fishing

Fish populations have been highly variable in Lake Tewaukon. In the 1940s, 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.

Lake Tewaukon has been an important public recreational spot since the 1880s. Historic uses on Lake Tewaukon included extensive boating, swimming, and fishing. When Refuge and flowage easements were secured in the 1930s, 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 Lake Tewaukon and Sprague Lake at higher elevations (since 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

Lake Tewaukon and Sprague Lake 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 Lake Tewaukon and Sprague Lake and all other Refuge pools will remain closed to recreational fishing.

The original compatibility determination completed in 1994, limited fishing to Lake Tewaukon and Sprague Lake. 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. (See Refuge Wildlife Disturbance Section.)

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 9 through 12). A public use summary guide is available to anglers and describes Refuge specific regulations and opportunities.

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

R4.1 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 Lake Tewaukon and Sprague Lake 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 9 feet in Lake Tewaukon and 8 feet in Sprague Lake.
- ✓ Maintain use of an aerator during October through March in Lake Tewaukon to help prevent the winterkill of fish species.

R4.2 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.
- ✓ Provide ice fishing opportunities on the two lakes during the winter and identify access points as described in the Refuge Wildlife Disturbance Section.
- ✓ 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 Map 9 through 12) 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 NWR is open for ring-necked pheasant and white-tailed deer hunting. Waterfowl and other migratory bird hunting conflicts with the Refuge purposes as an “inviolate sanctuary for migratory birds.” Migratory bird hunting is available on the adjacent North Dakota State Game Management area and other State and Federal public lands in the District. 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 other North Dakota State regulations apply. Refuge deer tags for the deer gun season are issued by the ND Game and Fish Department. The number of deer tags issued are based upon wintering deer populations (See Refuge Native Wildlife Section) and hunter density for safety reasons.

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 to reduce hunting group conflicts and migratory bird disturbance. Nontoxic shot is required. All other North Dakota State regulations apply.

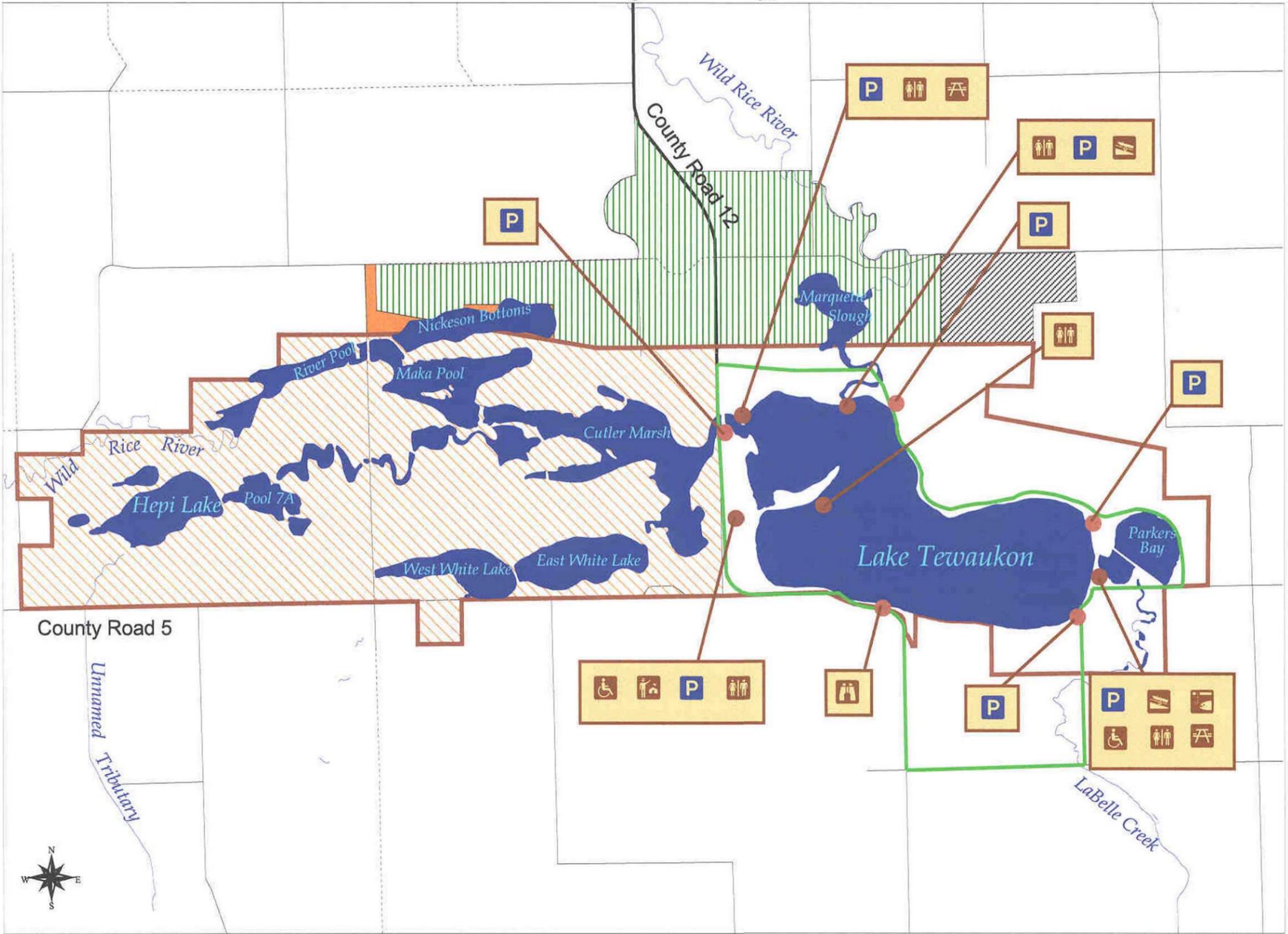
R4.3 Objective: Provide public opportunity for pheasant hunting in November and December after the fall waterfowl migration. Deer hunting opportunities will also be provided during the months of September, November, and December before and after the waterfowl migration.

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.

Tewaukon Unit

Sargent County, North Dakota



Legend

- Closed Area - Closed to All Public Use January 1 - August 30
- Krause Waterfowl Production Area (Open to Hunting per State Season)
- Nickeson Waterfowl Production Area (Open to Hunting per State Season)
- North Dakota Game and Fish Wildlife Management Area
- Auto Tour Route (Open May 1 through September 30)
- Boat Ramp
- Fishing Access Dock - Bank Fishing Open Year Round
- Refuge Headquarters
- General Parking Area
- Rest Room
- Universally Accessible
- Picnic Area
- Overlook

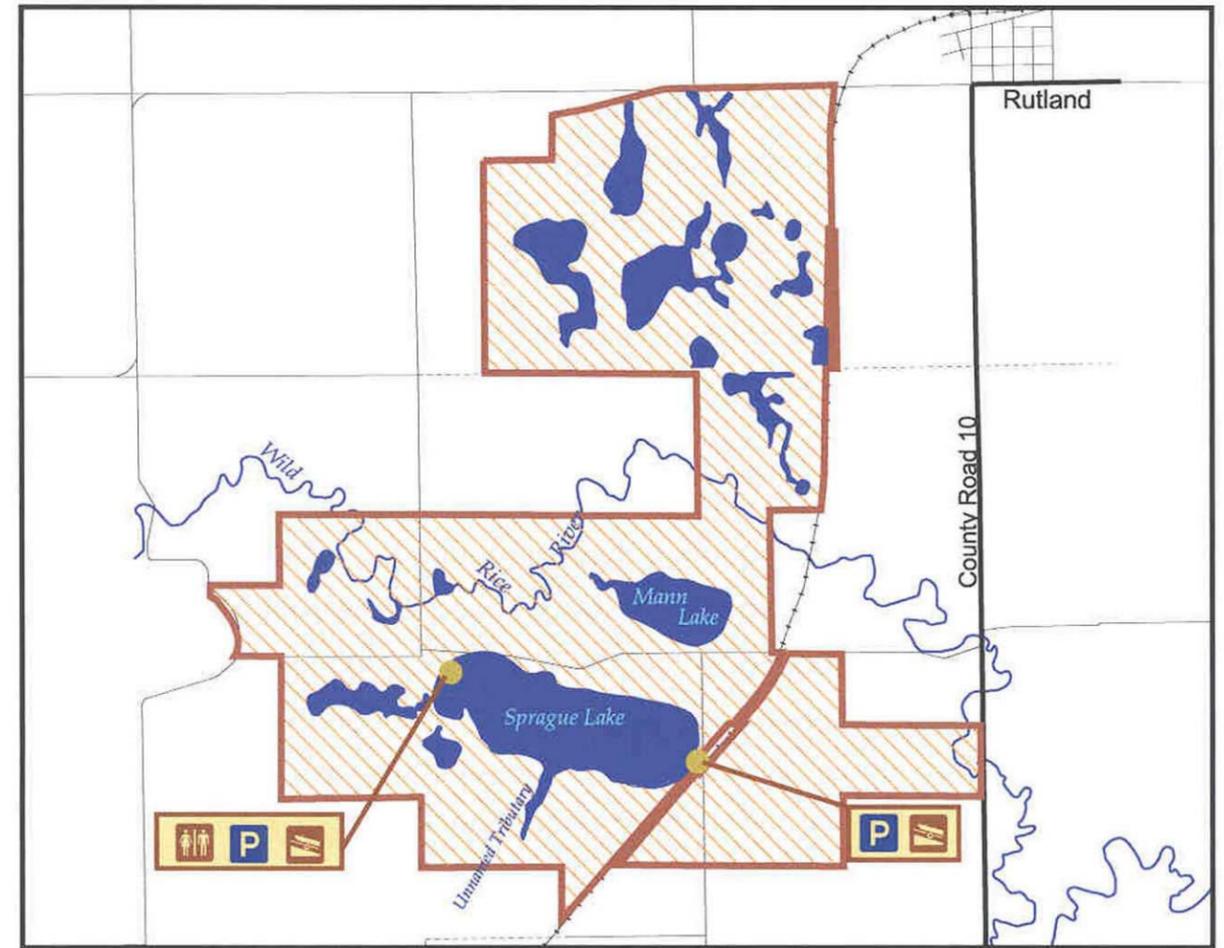
Please Consult Refuge Public Use Regulations for Specific Guidelines



Map #9 Public Use Tewaukon Unit
(May-August)

Sprague Lake Unit

Sargent County, North Dakota



1 0 1 Miles



Legend

Closed Area - Closed to all Public Use January 1 - August 30	General Parking Area
Managed Wetlands	Rest Room
Rivers and Streams	Boat Ramp
Road Types	
Limited Access Trail	
Gravel	
Paved	
Railroad	

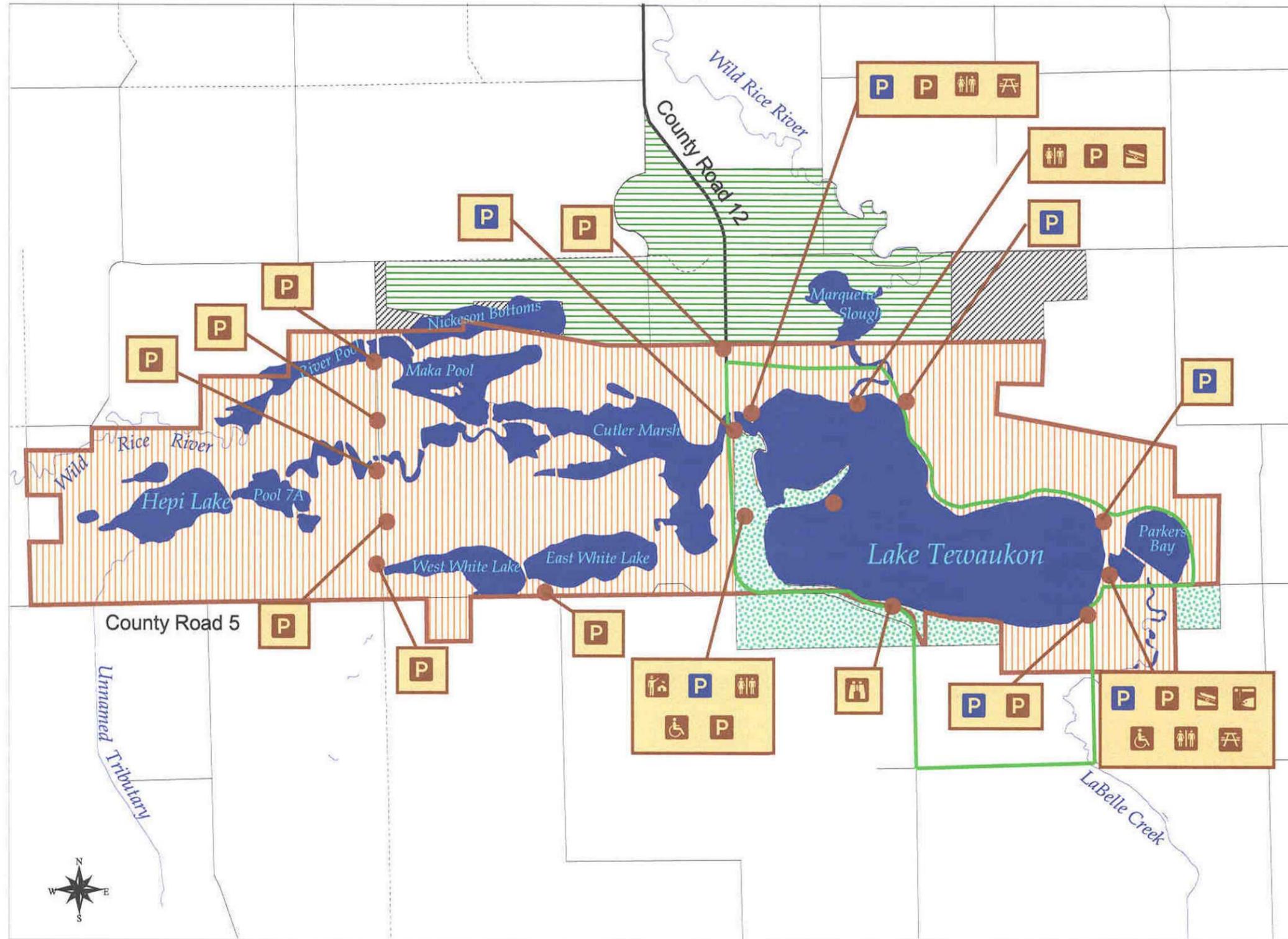
Please Consult Refuge Public Use Regulations for Specific Guidelines



Map #10 Public Use Sprague Lake Unit
(May - August)

Tewaukon Unit

Sargent County, North Dakota



Legend

- Public Use Area - Open to Archery in September, Special Permit Deer Hunting in November, and Pheasant Hunting in December
- No Hunting Area
- Waterfowl Production Area (Open to Hunting per State Season)
- North Dakota Game and Fish Wildlife Management Area
- Auto Tour Route (Closed October 1 through April 30)
- Boat Ramp
- Fishing Access Dock
- Refuge Headquarters
- General Parking Area
- Hunting Parking Area
- Rest Room
- Universally Accessible
- Picnic Area
- Overlook

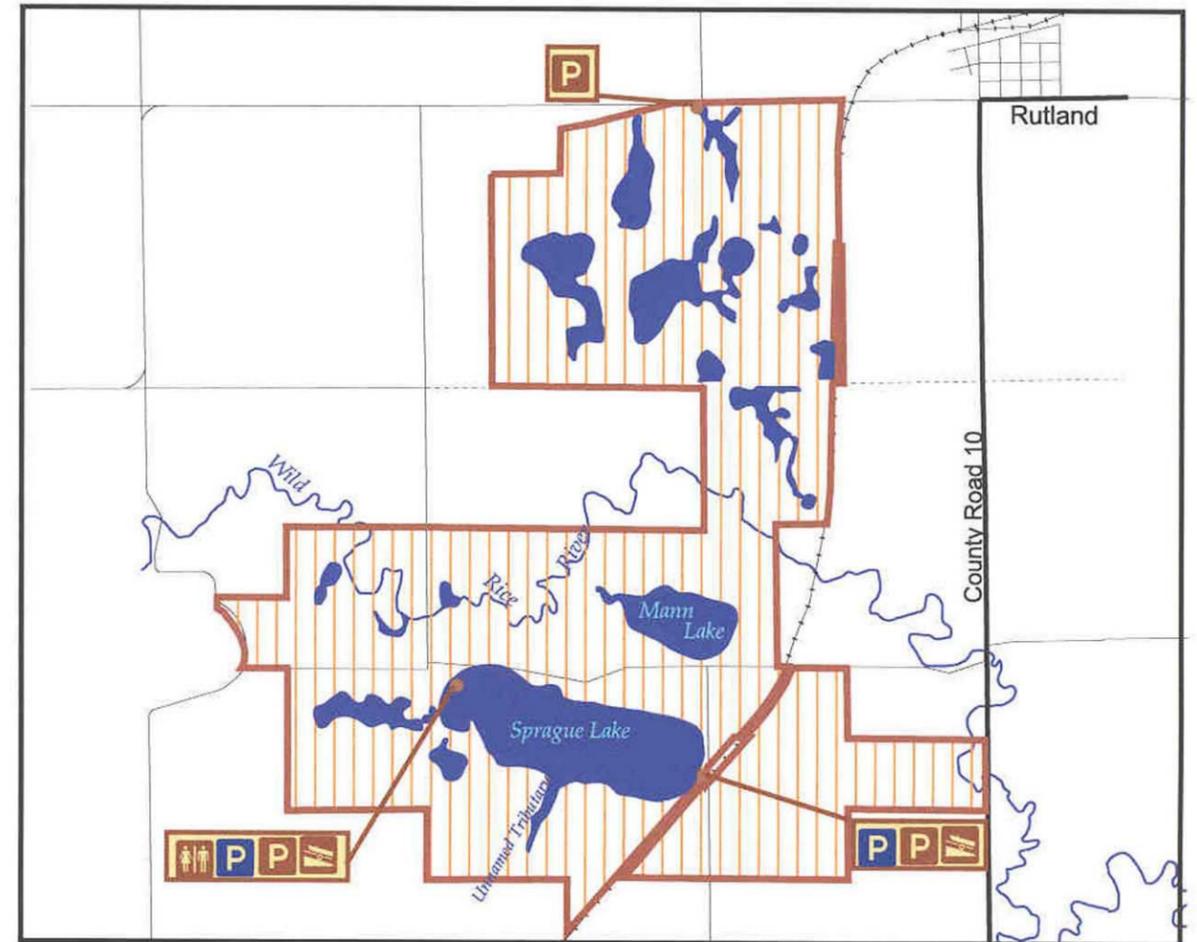
Please Consult Refuge and State Hunting Regulations for Specific Guidelines



Map #11 Public Use Tewaukon Unit (September-April)

Sprague Lake Unit

Sargent County, North Dakota



1 0 1 2 Miles



Legend

Public Use Area - Open to Archery in September, Special Permit Deer Hunting in November, and Pheasant Hunting in December	General Parking Area
Managed Wetlands	Hunting Parking Area
Rivers and Streams	Rest Room
Road Types	Boat Ramp
Limited Access or Trail	
Gravel	
Paved	
Railroad	

Please Consult Refuge and State Hunting Regulations for Specific Guidelines



Map #12 Public Use Sprague Lake Unit
(September - April)

Trapping

The Refuge had recreational trapping prior to 1998; however, the interest in trapping decreased due to the fur prices which made it difficult to justify the staff time for only one interested trapper. If fur price and interest increases, this use will be reevaluated. Recreational trapping is available on all waterfowl production areas in Ransom, Richland, and Sargent Counties.

Wildlife Observation and Photography

Wildlife observation and photographic opportunities are available from May through September on the Refuge east of County Road 12 (Map 9 through 12). Access to closed areas of the Refuge are by request only.

R4.4 Objective: Provide public opportunity for wildlife observation and photography on the east side of County Road 12 from May through September.

Strategies:

- ✓ Maintain the 8-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.

R4.5 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, snow geese, 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.

R4.6 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 wildlife groups and other partners.
- ✓ 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 by increasing news releases, programs, tours, presentations to local and interested groups, attending meetings, participating in local, County, and State activities, and briefing congressional offices.

R4.7 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 was 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." 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 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 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 located 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.

R4.8 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.

R4.9 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.

R5 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.

R5.1 Objective: Create opportunities for new and maintain existing partnerships among Federal, State, local agencies, organizations, schools, corporations, communities, and private landowners 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.

R5.2 Objective: 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 11998 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, over 10,000 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 1960s. 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.

Waterfowl Production Areas

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 levels: high, moderate, or low. The criteria used to determine a WPA's ranking was size of the tract, potential waterfowl pair densities shown on the Thunderstorm Map (See Map 13), and those with unique resources (i.e., tallgrass prairie, rare plants, and wildlife). A breakout of the priority level criteria for WPAs is as follows:

High Priority Level WPAs

- Over 160 acres in size
- Attract ducks 97 to 117 pairs/square mile (red) or 80 to 97 (yellow) on the Thunderstorm Map (Map 13)
- Has unique resources (tallgrass prairie areas)

Moderate Priority Level WPAs

- Between 100 to 160 acres in size
- Attract ducks 54 to 79 pairs/square mile (dark green); 37 to 53 pairs/square mile (light green) on Thunderstorm Map (Map 13)
- 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 13)
- Access and management potential low

All Tewaukon District WPAs were placed in these three priority levels and are listed in Appendix L and shown on Map 14.

Some management and activities would continue on all of the WPAs regardless of their priority levels. Those include:

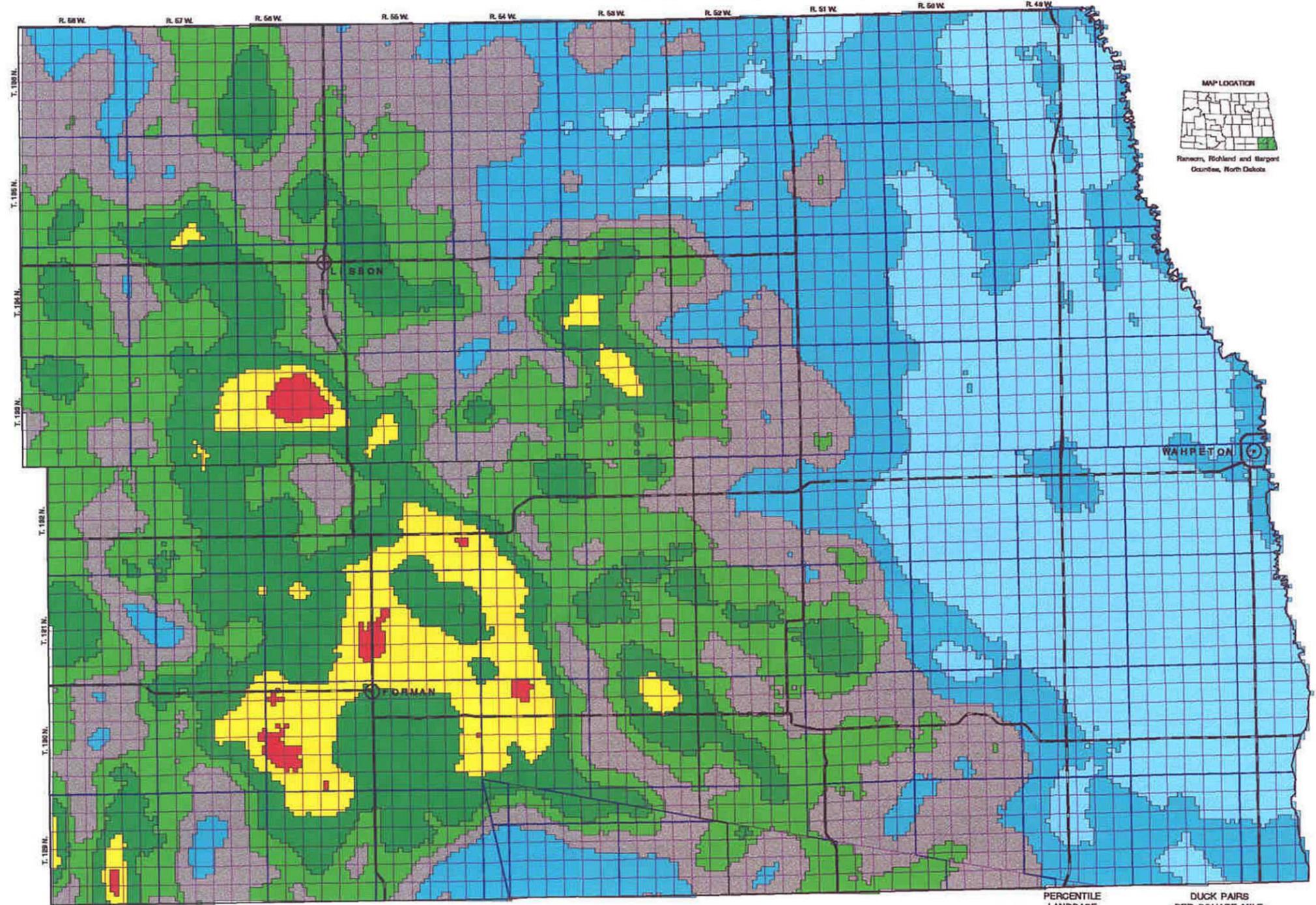
- All WPAs will be open to hunting, fishing, and trapping according to North Dakota State regulations. All other public activities will require a Special Use Permit and will be evaluated to determine if they are compatible with District purposes.
- All border fences and signs will be maintained.
- Weed 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.

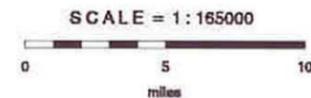
WATERFOWL BREEDING PAIR DISTRIBUTIONS

Tewaukon Wetland Management District, North Dakota



Waterfowl pair density information was generated using GIS modeling techniques utilizing USFWS National Wetland Inventory digital data, the USFWS-Region 8 Four Square Mile Survey results, and regression equations predicting duck pair/wetland relationships developed by the USFWS Habitat and Population Evaluation Team and USGS Northern Prairie Wildlife Research Center. The information presented represents the accessibility of 57.58 acre landscape units to the combined predicted breeding pairs for mallard, blue-winged teal, gadwall, pintail, and shoveler. For more information contact the HAPET Office, USFWS, Bismarck, North Dakota.

This map was prepared in September 2000.



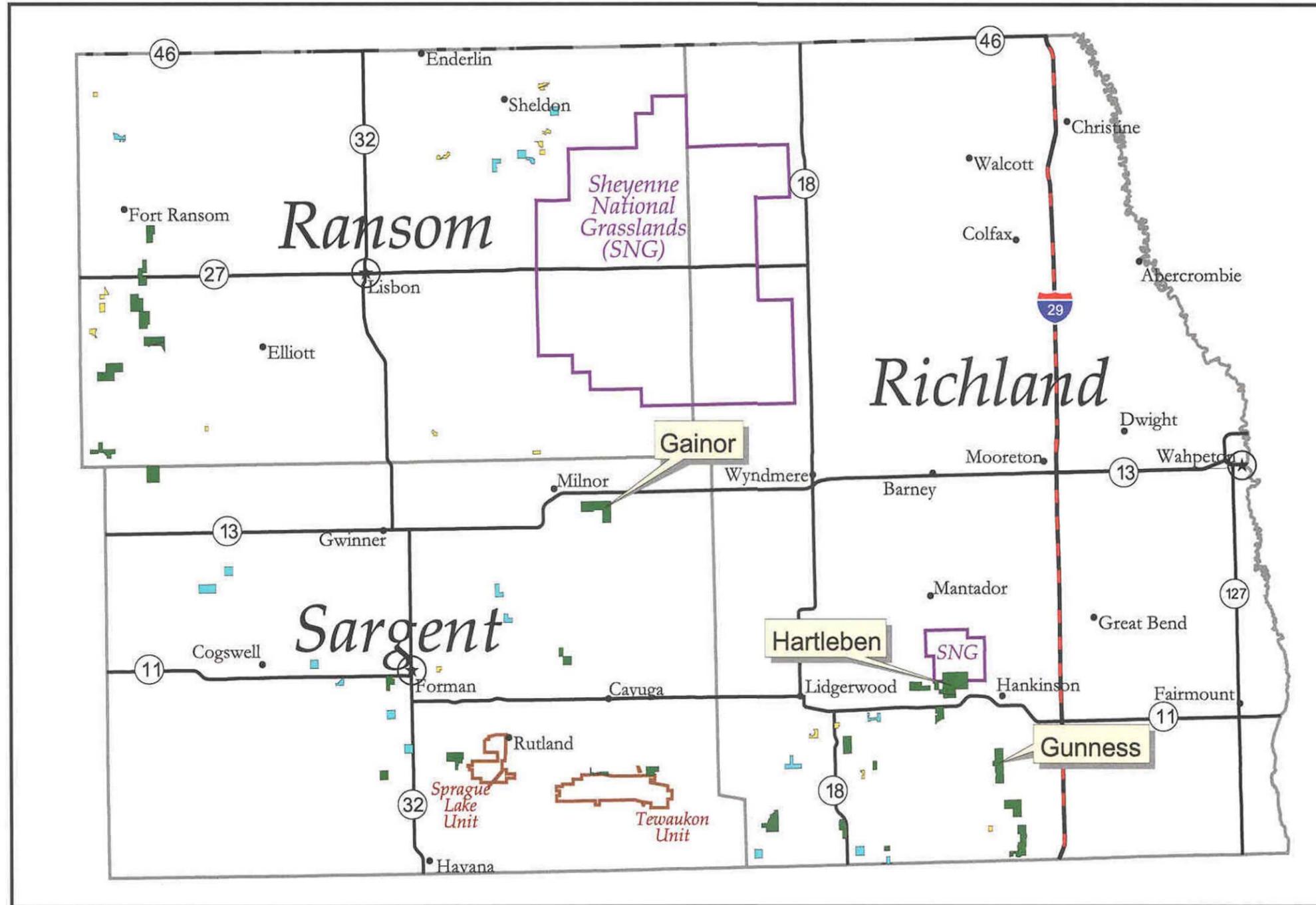
Projection: Universal Transverse Mercator, Zone 14

PERCENTILE LANDBASE	DUCK PAIRS PER SQUARE MILE		
	range	mean	
99.5	97 - 117	102	
95	80 - 97	87	
80	54 - 79	64	
60	37 - 53	44	
40	19 - 36	28	
20	6 - 18	10	
0	0 - 5	3	

Map #13 Potential Waterfowl Pair Densities.

Tewaukon Wetland Management District

Ransom, Richland, and Sargent Counties, North Dakota

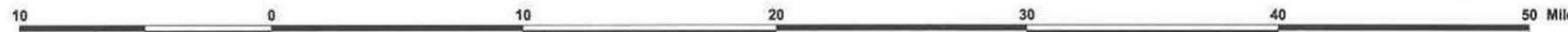


Legend

Waterfowl Production Area Priorities

- High
- Moderate
- Low

Prairie Focus Areas



Map #14 Waterfowl Production Area Priorities

Habitat Management

D1 Goal: Preserve, restore, and enhance the ecological diversity of native flora, other grasslands, and wetlands within the tallgrass prairie wetland ecosystem.

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.

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

D1.1 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.)

Strategy:

- ✓ Develop a Monitoring Plan for native prairie on high priority level WPAs to determine species composition and relative abundance.

"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.

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. The tree rows on the Guinness and Gainor WPAs are at the fringes of the grasslands and, at this time, no plans exist to remove them. Several tree rows and individual trees exist on the Hartleben WPA. A unit of 160 acres or greater will be selected and, for now, only trees from this area will be removed. 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.

D1.2 Objective: Manage three WPAs as Prairie Focus Areas (Hartleben/Aaser WPA, Gainor WPA, and the Guinness WPA) (Map 14): 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 in each of the following categories: 0 to 10 cm; 10 to 20 cm; 20 to 30 cm; 30 to 60 cm; greater than 60 cm; 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.

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 99 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 10,000 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 considered by the Service for funding of grassland easements and fee title acquisition through the Land and Water Conservation Act. This project includes the tallgrass prairie region in both North and South Dakota. The Dakota Tallgrass Prairie Project, described in the Dakota Tallgrass Prairie Environmental Assessment, targets tallgrass prairie remnants that do not have high densities of associated wetlands.

"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

D1.3 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 (no conversion of grassland cover and no haying or mowing before July 15). The following objective was developed to ensure that grassland easement interests are protected.

D1.4 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.

D1.5 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 obscenity 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, farming, 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, Ashe, and Smith WPAs. These fields will be converted to a more diverse native plant community as opportunity and funding become available.

D1.6 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, farming, 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.

D1.7 Objective: Protect the quality and health of all prairie wetlands to preserve their natural productivity, longevity, and function on WPAs.

Strategy:

- ✓ Gather baseline information on existing wetland conditions on 10 percent of the High priority WPA wetlands, determine monitoring parameters, and identify external threats.

Water Rights

The only water control structure located 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.

D1.8 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.

D1.9 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 easements were purchased.

D1.10 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.
- ✓ Evaluate the impacts of water management and irrigation projects affecting surface and groundwater on easement wetlands.

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.

D1.11 Objective: Identify and protect existing fens in the District through easements, fee title purchases from willing sellers, and cooperative agreements with private landowners.

Strategy:

- ✓ Work cooperatively with the ND Heritage Program, other interested groups or individuals and landowners to identify and protect 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.

D1.12 Objective: Improve water quality and native aquatic resources within riparian zones of the Red River of the North Watershed.

Strategies:

- ✓ Using existing USDA programs and other partner resources, develop opportunities under the Partners for Fish and 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.

Nonnative Plant Management

See Refuge Nonnative Plant Management Section for more information (Objective R1.10).

Prescribed Burning and Wildfires

See Refuge Prescribed Burning and Wildfire Section for more information (Objective R1.11 and R1.12).

Wildlife

D2 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 13), 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.

D2.1 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 14).

Strategies:

- ✓ When the average nesting success falls below 30 percent (Mayfield) and wetland conditions are favorable, initiate predator control in the spring prior to the waterfowl nesting season, for approximately 2 to 3 weeks.
- ✓ 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.
- ✓ Maintain existing predator fences.

Migratory Birds

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

D2.2 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 14).

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 and reduces the spread of the disease.

D2.3 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 management 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.

D2.4 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 Krause WPA (Sargent County) (Map 14).

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 Service lands in the Tewaukon District. 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.

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.

D2.5 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 Krause WPA (Sargent County) (Map 14).

Fish

Several fish surveys have been conducted in the Sheyenne River and the Red River of the North. The earliest survey was in 1892 by A.J. Woolman in both of these rivers. Since that time, researchers, the North Dakota Game and Fish Department, the North Dakota Department of Health, North Dakota State University Department of Zoology, and the Fish and Wildlife Service have conducted fish surveys in one or both of these rivers. From 1892 to 1994, 84 species of fish (77 considered native) were reported from the Red River of the North basin (Koel 1997). The majority of fish (34 percent) were in the Cyprinidae family (includes shiners, dace, chubs and minnows), second were the Percidae family (darters, perch and walleye) (Koel 1997). Woolman (1896) reported longnose gar and blacknose shiner in the Red River of the North Watershed. These two species were not picked up in any subsequent surveys. Banded killifish have been collected before 1892 from the Sheyenne River but have not been collected since (Koel 1997). The greater redhorse, in the sucker family, has been found in the Red River of the North and the lower Sheyenne River but no recent observations have been made (U.S. Fish and Wildlife Service 1995).

During high water years, a few large wetlands on Waterfowl Production Areas provide some temporary fish habitat (Englevale Slough, Wollitz, and Hartleben WPAs). Most of these fish populations would be comprised primarily of fathead minnows. Other fish would most likely come from illegal introductions or movement of fish during high water years.

The primary purpose of WPAs is to benefit waterfowl. Recent research indicates that fish compete directly with ducklings for invertebrate food sources. Hill et al. (1987) reported that mallard ducklings feeding in lakes with high densities of fish had low densities of aquatic invertebrates, survived at lower rates than those feeding in areas with low densities of fish. Brood sizes also appeared to increase following removal of fish from wetlands where ducklings were foraging (Giles 1994).

The planning team did not develop specific management objectives for native stream fish or other native fish as no streams occur on District Service lands. No fish introductions are planned for larger wetlands on WPAs because they provide only temporary fish habitat and direct competition for food occurs between fish and ducklings.

Nonnative Wildlife

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

D2.6 Objective: Restrict the spread of existing and additional nonnative animal species (carp, house sparrows, feral dogs and cats) that adversely impact native species.

Strategies:

- ✓ Gather existing information and promote additional research on management techniques and affects of nonnative 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 nonnative animal species.

Other nonnative species, like the ring-necked pheasant, are not known to adversely impact District native species. For more discussion see Refuge Nonnative Wildlife Section

D2.7 Objective: Refrain from carrying out management activities that specifically encourage population expansion of existing introductions (pheasants, gray partridge) to the detriment of native species.

Endangered Species

D3 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 reported in the District today.

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.

Bald Eagles

In 1999 and 2000, two bald eagle nesting attempts were documented on private land in the District. The planning team did not develop management objectives for bald eagles since they are primarily migratory visitors and no nesting has occurred on Service lands in the District.

"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*



Western Prairie Fringed Orchid, Cindie Brunner

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 Tewauckon District counties.

D3.1 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 conservation plans (including fire, weed control, haying and mowing rotations, and grazing systems) 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.

Migratory Nongame Birds of Management Concern

In 1995, the Fish and Wildlife Service identified migratory nongame birds that were of management concern across the United States (U.S. Fish and Wildlife Service 1995). These species are of concern because of documented or apparent population declines, small or restricted populations or dependence on restricted or vulnerable habitats. The bird species that occur or may occur on the Tewaukon District include: (*Nest on the District)

Black tern *	Olive-sided flycatcher	Loggerhead shrike
Ferruginous hawk	Sedge wren *	Red-headed woodpecker
Northern harrier *	Dickcissel	Chestnut-collared longspur
Yellow rail	Baird's sparrow	
Upland sandpiper *	Grasshopper sparrow *	

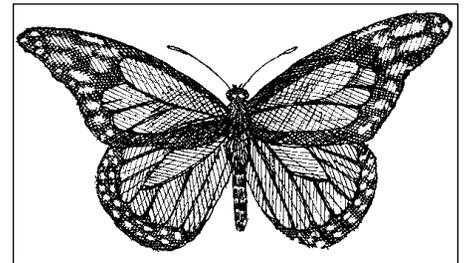
With the exception of the five bird species that nest on the District, the other birds are seen only occasionally on the District during migration. The northern harrier, upland sandpiper, and the grasshopper sparrow have been chosen as indicator species for the Tallgrass Prairie Management Approach. Population, breeding, and habitat information on these three indicator species are addressed in the Refuge Tallgrass Prairie Management Approach Section. Since little information exists about District breeding populations of the remaining birds of Management Concern, more habitat suitability and use information needs to be identified.

D3.2 Objective: Evaluate methods to determine habitat suitability and use by these species (black tern, ferruginous hawk, yellow rail, loggerhead shrike, red-headed woodpecker, olive-sided flycatcher, dickcissel, Baird's sparrow, chestnut-collared longspur).

Other Rare Species

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).



Monarch Butterfly, Cindie Brunner

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) 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.

D3.3 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.

D3.4 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.

D3.5 Objective: Evaluate reintroduction of the three rare butterflies on suitable native prairie sites.

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.

North Dakota State Listed Rare Species

Animals

Northern (Greater) Prairie Chicken - State Threatened
Mountain Plover - State Extirpated
Pugnose Shiner - State Endangered
Greater Redhorse - State Threatened
Prairie Skink - State Threatened

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 1870s (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 1940s 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.

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.

Prairie Skink

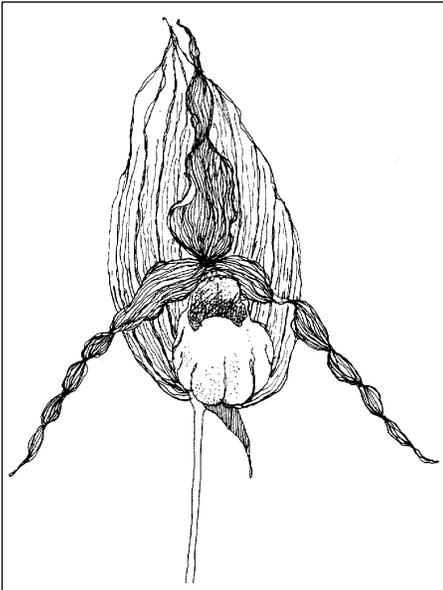
Prairie skinks were observed on the Hartleben WPA in 1997 and 1998. Prairie skinks are active during the summer and are found in sandy areas and grassland in eastern North Dakota. Specific management objectives were not developed for prairie skinks since District prairie habitat objectives would provide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

Plants

See Appendix C

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.



White Lady's Slipper, Cindie Brunner

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.

D3.6 Objective: Maintain and monitor an average population of 200 to 300 small white lady's slippers on the Hartleben WPA.

Strategy:

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

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.

D3.7 Objective: Determine habitat suitability for North Dakota State listed rare wildlife and plant species on WPAs within the District.

Strategy:

- ✓ 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.

D3.8 Objective: Protect North Dakota State listed wildlife and plant species habitat to maintain North Dakotas native biodiversity.

Strategy:

- ✓ 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.

D4 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, Trapping, and Fishing

D4.1 Objective: Provide information about public opportunities for hunting, trapping, and fishing according to State and Federal Regulations on Waterfowl Production Areas.

Strategy:

- ✓ Work cooperatively with the ND Game and Fish Department to conduct law enforcement patrols on the District to ensure compliance.

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.

D4.2 Objective: Through signs, pamphlets, and programs provide interpretation of the region's natural, cultural, historical resources, recreational opportunities, 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 have had cultural evaluations (Class I and II) conducted where rights-of-way or construction has been 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, Grinstead, 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.

D4.3 Objective: Conduct cultural resource inventories on construction and development sites as necessary.

Strategy:

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

D4.4 Objective: Preserve and protect existing cultural resources and future discoveries of archaeological sites associated with District 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

D5 Goal: Promote partnerships to preserve, restore, and enhance a diverse, healthy, and productive tallgrass prairie ecosystem in which the District plays a role.

D5.1 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 District 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.
- ✓ Coordinate and work with the U.S. Forest Service and Nature Conservancy on prairie restoration, enhancement, and protection issues (including sharing seed sources, prescribed burning, nonnative plant control, etc.).

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.

- Easement Refuges were established by Executive Order 6910 on November 26, 1934 which provided for acquisition of easements for maintaining and operating artificial lakes, to maintain a closed refuge, and a wildlife demonstration unit.

E1 Goal: Administer existing easement refuges.

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 located 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.

E1.1 Objective: Protect all easement refuge property interests from hunting, draining, or conversion in Sargent County.

Strategies:

- ✓ Annually monitor the two remaining easement refuges for conflicts.
- ✓ Work cooperatively with landowners to resolve conflicts.

E1.2 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.

E1.3 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 comprises a management unit. Then the unit will be transferred to the Service.

