

WAUBAY NATIONAL WILDLIFE REFUGE COMPLEX

**including
Waubay National Wildlife Refuge
and
Waubay Wetland Management District**

Environmental Assessment

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I. Purpose of Proposed Action

Waubay Complex was established to provide “. . . a refuge and breeding ground for migratory birds and other wildlife.” The purpose of the proposed action, the Comprehensive Conservation Plan (CCP), is to accomplish the goals established for the Complex, including:

- *Habitat Goal: To preserve, restore and enhance the ecological diversity of grasslands, wetlands, and native woodlands of the Prairie Pothole Region of the Great Plains on Waubay National Wildlife Refuge Complex.*
- *Wildlife Goal: To promote a natural diversity and abundance of native flora and fauna of the Prairie Pothole Region of the Great Plains on Waubay National Wildlife Refuge Complex.*
- *Cultural Resources Goal: Protect and interpret significant historic and prehistoric cultural resources associated with Waubay National Wildlife Refuge Complex.*
- *Wildlife-dependent Recreation Goal: To foster an understanding and appreciation of the ecology and management of the fauna and flora and of the role of humans in the Prairie Pothole Region of the Great Plains by providing Complex visitors of all abilities with compatible wildlife-dependent recreational experiences.*

II. Need For Proposed Action

The need for a CCP for the Complex has been made clear by the declining status of numerous grassland and wetland-dependent wildlife and their habitats and an increased demand for wildlife-dependent public use. Since the establishment of the Refuge in 1935 and the WMD in the 1960s, many changes have occurred to the landscape. Much habitat has been lost to agriculture, roads, towns, and other development. This loss of habitat has had a profound effect on wildlife populations that once depended on vast expanses of undisturbed grasslands and wetlands. Management of the Complex as outlined in the CCP will help to stem these losses and help to restore biodiversity to the landscape.

There is also a need to better define how the Complex will satisfy the needs of citizens and agencies that have a vital interest in how the Complex is managed. The CCP also addresses the need to provide an understanding and appreciation of wildlife and of people's role in the environment. Providing more environmental programs and better interpretation will increase the public's knowledge about the biological values that continue to be lost each day and the need to prevent further losses. The Plan also calls for increased opportunities for wildlife-compatible recreation.

III. Affected Environment

For a description of the affected environment, please refer to Chapter III of the CCP - Summary Waubay Complex and Resource Descriptions.

IV. Alternatives, Including the Proposed Action

To carry out the proposed action, the Comprehensive Conservation Plan (CCP), the U.S. Fish & Wildlife Service must comply with provisions of the National Environmental Policy Act (NEPA). An Environmental Assessment (EA) is required under NEPA to evaluate reasonable alternatives that will meet stated goals and to assess the possible impacts of all alternatives to the human environment. The EA serves as the basis for determining whether implementation of the proposed action would constitute a major Federal action significantly affecting the quality of the human environment, in which case an Environmental Impact Statement (EIS) may be needed. The EA also provides for the involvement of other Federal agencies, non-governmental organizations and the public in the decision making process.

Three alternative CCPs are considered and discussed in this Environmental Assessment. They include No Action, Enhanced Management, and Tallgrass Prairie alternatives. Under the No Action alternative, current management would continue as is with no increase in funding or staffing. Enhanced Management would require additional funds and staff to provide proactive habitat management, wildlife and habitat monitoring, and public use and education programs. The Tallgrass Prairie alternative would concentrate staff efforts and funding on preserving, restoring and managing the highly imperiled tallgrass prairie ecosystem, especially in the Minnesota-Red River Lowlands.

These alternatives will facilitate continuity of management and describe the decisions made to achieve upland and wetland protection, restoration, and management for the next 15 years. They are designed to further the achievement of Refuge System and Waubay Complex goals, which center on the protection and enhancement of wildlife and their habitats. The goals and their associated objectives will also contribute toward the accomplishment of the goals of the Tallgrass Prairie/Missouri River Main Stem ecosystem, as well as other regional plans such as the North American Waterfowl Management Plan.

Other alternatives such as Custodial (all lands are closed, little to no management or public use, staff reduced to one or two people) and All Public Use (increase all efforts in public use and education, reduce management of lands) were considered but rejected because they would not comply with the purposes of the Refuge System or Waubay Complex.

Alternative A. Current Management (No Action) Alternative

Current management of the Complex would continue. No new funding or staff levels would occur, and programs would follow the same direction, emphasis, and intensity as they do at present.

**Alternative A.
Current Management
(Refuge)**

Waubay National Wildlife Refuge

No additional restoration of grasslands would occur on the Refuge under this alternative. Continuing the current management approach will probably result in a degradation of native grass stands over time. No effort will be made to enhance or research the importance of Refuge woodlands. Monitoring will be limited to mostly waterfowl surveys with incidental sightings of threatened and endangered species. Public use programs will continue, as is, with no additional educational or recreational programs offered.

All grasslands within the approved boundary of Waubay National Wildlife Refuge are protected. No plans exist to increase the boundaries beyond current limits. Before water levels increased, there were approximately 1,700 acres of native grasslands and less than 200 acres of tame grasslands on the Refuge. High water has probably covered 400 to 500 acres of mostly native grasses since 1996.

Restoration of tame grasslands on the Refuge would not occur. Management would be focused on maintaining maximum height and density for nesting cover. Monitoring to achieve or maintain these conditions would not be done except for visual observations. Restoration of degraded native grasslands or those that reappear from receding waters would also not occur, except to provide necessary weed control.

Current management of Refuge grasslands is based on maintaining overall condition and controlling weeds. Grazing is the management tool of choice to reduce litter and to impact cool season exotic grasses. Haying and burning are used minimally, but the goals would be the same. Over time, native grasslands will slowly degrade in condition and composition under this management regime. More aggressive and active management and monitoring are needed to enhance and maintain the ecological diversity of native prairie tracts. Under this alternative, Russian olive, juniper and buckbrush stands will likely increase, reducing habitat for grassland species, including species of concern such as the Dakota skipper butterfly.

Of the approximately 2,000 acres of wetlands on the Refuge, only about 100 acres are temporary/seasonal in nature. Another 200 acres are semipermanent or hold water throughout the growing season most years. Waubay Lake (currently encompassing Hillebrand's and Spring Lakes) makes up the remainder of Refuge wetlands.

Two semi-operable water control structures exist; a third is under water and was located between Spring Lake and Swan Pond. No plans are in place for monitoring or managing these wetlands to enhance their productivity for wetland wildlife.

Approximately 200 acres of woodlands occur on the Refuge. Forest types include oak savannah and eastern deciduous forests. Early in the Refuge's history, three fields (50 acres total) were cut out of woodlands to provide food plots for wintering deer. As water levels rose, these plots were planted to alfalfa to reduce maintenance needs. These croplands would be allowed to reforest naturally, but no special effort will be made to shorten this time frame with plantings or other restoration efforts. Enhancement of Refuge woodlands would not occur except to maintain food plots, outside traditional forest areas, to reduce deer browsing pressure. No effort will be made to research the impacts of deer on woodlands or ways to minimize these impacts or to monitor any changes in wildlife use over time.

Wildlife

Endangered and threatened species that may occur on the Refuge include the American burying beetle, bald eagle, piping plover, and western prairie fringed orchid. Incidental sightings of these species will be noted, but no special effort will go into developing inventory or monitoring plans for these rarely seen species. If any of these species of concern are observed on the Refuge, special effort will be made to protect them and their habitat needs.

**Alternative A.
Current Management
(Refuge) cont'd.**

In the past, the focus of Refuge wildlife surveys has been waterfowl. Although high water levels have made it more difficult to get accurate surveys, staff efforts are still mostly dedicated to waterfowl surveys. Some effort has gone into surveying for American burying beetles and Dakota skippers, but these activities are not high priorities. A constant effort mist netting station to determine survival and reproduction of passerines was begun in 1994, but most sites were flooded out by 1996. Currently, the only banding conducted is for educational purposes.

Waterfowl surveys will be continued to document use and any potential conflicts with other Refuge activities or public use. Staff will also continue to assist with cooperative surveys such as State fisheries or deer surveys and National Audubon Society's Christmas Bird Count. Rewriting and updating the Wildlife Inventory Plan will be a low priority item.

Cultural Resources

Previous surveys have found numerous cultural and historical sites and artifacts on the Refuge. Only one outdated kiosk sign exists to inform visitors of this rich resource. Without additional funding this is not likely to change. Little effort will go into interpreting these resources or monitoring and protecting sites affected by high water levels. Archaeological Resources Protection Act (ARPA) regulations will be complied with where developments or other ground breaking activities occur to meet minimum requirements.

Public Use

Public use and recreation programs will continue at current levels. White-tailed deer hunting would continue for archery, rifle and muzzleloader seasons. Providing deer hunts for youth and people with disabilities will not be planned for. Ice fishing (with current restrictions) will be allowed on the refuge.

**Alternative A.
Current Management
(Refuge) cont'd.**

Two trails are available for visitor use. One is ½ mile and circles around the headquarters, traveling around a pond and through bur oak woods. Part of this trail is accessible to people with disabilities. The other trail is ¼ mile and traverses a hill through native grasses allowing the visitor an overview of Spring (Waubay) Lake. These trails offer variety and good birding opportunities, but do not allow those who would like to spend more time hiking the opportunity to do so. Under this alternative, little effort will go into correcting this deficiency.

With no Outdoor Recreation Planner on staff, educational and interpretive efforts fall to the regular staff. Educational programs are limited and not actively promoted. Programs, for use on or off the Refuge, are generally developed when requested, which may be three to four times per year. Requests for programs either at area schools or on the Refuge are often turned down if staff is not available or conflicts with management activities occur. A “Wetland Trunk” is also available for teachers to use at their schools and a “Migratory Bird Trunk” for use on the Refuge. These trunks allow teachers to lead classes and activities without the need for staff expertise. Although these tend to be popular items for both staff and teachers, limited time and resources will not allow more to be developed.

Currently, programs are offered either in the Visitor Center, outside (if weather permits), or in the shop area when necessary. Although a building devoted solely to environmental education could increase visitation and provide for year-round learning, development of this center will not be explored under this alternative.

Special events are limited to a program offered during National Wildlife Refuge Week and the Christmas Bird Count. This level of participation would continue under this alternative.

Volunteers are a rarely used resource at the Refuge. Although many opportunities are available for volunteers, a lack of time and knowledge as to how to develop and promote a core group limits our ability to benefit from their assistance and to add this additional support base.

Waubay Wetland Management District

Continued management at current levels could result in a gradual degradation of native prairie sites as staff efforts and funding fall short of optimal management goals. Tame grasslands will exhibit fewer noticeable changes in condition. Monitoring efforts will continue to fall behind management needs. Public use (fishing, hunting, and other uses) will continue as is, but educational programs would not be promoted or developed beyond the minimal efforts accomplished now.

**Alternative A.
Current Management
(District)**

Habitat

Grassland easements would continue to be purchased at current levels from willing sellers. In the 10 years since the grassland easement program has been in effect, an average of 10,000 acres per year have been protected. No effort would be made to promote or increase the current level or location of easement purchases. Since Duck Stamp funds are used to protect these lands, tracts are selected primarily for their benefit to waterfowl and must rate 40 or more pairs/square mile on the Waterfowl Breeding Pair Distribution (WBPD) (Map 8) and meet or exceed the threshold scores for the grassland easement evaluation worksheet. No alternative funding sources would be explored to protect grassland tracts that do not meet these criteria. Tallgrass prairie sites would not be protected unless they meet the requirements for waterfowl, i.e., within high density wetland zones. Assistance to the Tallgrass Prairie Biologist would be limited to providing office space and supplies as needed.

Few, if any lands, are presently considered for fee-title acquisition. It is not the preferred method for protecting habitat because of the added management burden of new tracts and the host of management challenges they present. Fee-title acquisitions would be limited to exceptional tracts or those requiring special protection, or particular roundouts to WPAs. Partnerships would not be explored for protecting important habitats or for assisting with development and management of such tracts. Promotion of other funding sources, and assistance to other agencies, watershed groups and partners would be minimal.

Most crop fields and food plots on Waterfowl Production Areas have already been planted to tame or native grasses. Little effort has gone into restoring tame grasses to native species due to a lack of time, funds and equipment operators. Most grassland restoration is restricted to newly acquired WPAs. Tame grasslands on WPAs are currently managed to provide height and density for nesting cover. Where croplands are present on newly purchased grassland easement tracts, these fields are restored at the landowner's expense. On privately owned grasslands, without grassland easements, incentives for private landowners to restore grasslands are limited to dollars and staff available in the Partners for Fish and Wildlife (PFW) program and current program direction.

Grazing, haying, and prescribed burns are the tools presently used to manage WMD grasslands. Grazing is used most often as it generally accomplishes the job of reducing litter and rejuvenating native stands, as well as provide forage for local landowners. In general, grazing rates average one AUM/acre and cattle may be on a site for up to one month, during the period May 15 to September 1, depending on the size of the tract. Smaller units of larger tracts may be grazed twice, or just one part of a large tract may be grazed in a year. Haying is used infrequently since rested grasslands often become havens for pocket gophers. Pocket gopher infested land is rough on equipment and operators. Haying is also not allowed on Service lands until after July 15, and this deters some landowners because of the corresponding decrease in forage quality. However, during periods of drought, more habitat management is accomplished through haying as landowners are in greater need of hay and are willing to hay within management guidelines on Service lands. A small staff, safety considerations, and sometimes negative public perception (e.g., burning up needed forage) limit the use of prescribed burning as a management tool.

Native grasslands are treated to perpetuate native species and diversity. This is accomplished through removal of vegetative litter and timing management to negatively impact cool season exotic grasses, brush or weeds. Little effort is made to manage low quality stands more aggressively or to document changes (positive or negative) resulting from management activities. Tame grasslands are generally managed to provide dense nesting cover - mostly through periodic removal of litter.

Management of Service owned lands would continue at existing levels. In 1999, 3,554 acres were grazed, 67 acres hayed and 15 acres prescribed burned in the WMD. This amounts to 15 percent of total upland acres managed in some form. The remaining 85 percent of uplands that are rested provide cover and nesting habitat for waterfowl and other wildlife. Monitoring of most sites is not accomplished except for visual observations.

With 199 WPAs, treating each and every one is neither practical nor necessary. At the current rate it would take 7 years to manage all upland acres. Some tracts need regular maintenance while others can remain idle for a number of years without any loss of diversity or vigor. Generally, each tract needs to be managed separately and on its own schedule according to vegetation type, weed problems, soils, etc. Current management is based according to which WPAs need it most and can be managed easily, i.e., where cooperators are located, which have the necessary access or water developments, etc. Although this works for the most part, some tracts may be neglected and if existing managers leave, no plans or management objectives are in place for the next manager to follow. Under this alternative, diversity of native grasslands may suffer since efforts to manage and monitor these sites will probably lag behind vegetative changes, especially since clear objectives for each site have not been developed.

Biological control of weeds would remain an emphasis in this alternative, with assistance provided to State and local agencies and private landowners. Chemical and mechanical methods would still be employed to help reduce or control nuisance plants, as necessary.

Creating larger blocks of habitat in order to maximize management efforts and to recreate historical landscapes would not occur. Incentives for private landowner management of grasslands, e.g. grazing rotations, would be limited by Partners for Fish and Wildlife funding and program emphasis.

Maintenance of grasslands would be reduced as monitoring is limited on both easements and fee-title lands. Private lands improved with Wildlife Extension Agreements (WEAs) and Conservation Extension Agreements (CEAs) are not monitored at all. This effort would not change under this alternative. Although a computerized mapping system would greatly expedite monitoring and maintenance of easements, fee-title and other lands, this would not be a priority in terms of funding or staff effort.

Wetlands would continue to be protected, mostly by purchasing easements from willing sellers. An average of about 2,000 acres of wetlands are protected each year under the easement program. Selection criteria for wetland easements purchased with Duck Stamp dollars would remain the same - focusing on areas rated 40 or more pairs/square mile on the Waterfowl Breeding Pair Distribution (WBPD) map, and meeting other criteria established for the Small Wetlands Acquisition Program. Only high quality wetlands or those requiring special protection would be acquired under fee-title. No special effort would be made to assist or advise USDA or other conservation groups, local governments or partners to promote ongoing or to develop new wetland protection programs.

Wetlands would be restored on all fee-title and easement lands, as currently occurs. Restoration efforts on private lands will continue and would be limited only by available staff and funding for the PFW program.

Enhancing and managing wetlands would continue on a limited basis. In 1999, 3 of 16 wetlands with water control structures had boards removed to lower water levels and encourage vegetative growth. No monitoring is in place on these wetlands except for visual observations. There are no overall plans or individual site plans in place for managing or monitoring wetlands with water control structures. Productivity of these wetlands will suffer as a result. Attendance at meetings and assistance to watershed groups and others interested in protecting and enhancing wetlands will be limited. Creation of wetlands on private lands will continue as long as funding and staff is available in the PFW program.

Monitoring of wetland easement contracts would continue, but development of a mapping system to improve and facilitate enforcement and other public needs would not be emphasized. Restored or created wetlands on private lands are not currently maintained or monitored.

Native woodlands are a neglected and little known resource in the WMD. Currently, there are no coulee or other woodlands protected by public ownership in this area except at Sieche Hollow State Park. These areas may be magnets for migratory birds, and very important for some species, especially warblers. In 1999, five different warbler species were observed on a privately owned tract in Roberts County. Turkey vultures and pileated woodpeckers have also been observed in these woodlands and may be nesting here. No effort would be made to research, protect or monitor the loss or use of woodlands in the WMD under this alternative.

Wildlife

Complex staff would continue to document the presence and location of bald eagles, piping plovers, whooping cranes, eskimo curlew, interior least terns, American burying beetles, Western prairie fringed orchids and Topeka shiners as they became known, but no special effort would be made to develop inventory or monitoring plans for these or other species of concern.

With only one biologist to cover 40,000 acres of WPAs, monitoring of other wildlife species would continue at current levels. This includes one Breeding Bird Survey (BBS), waterfowl breeding pair surveys, and cooperative surveys such as mourning dove and Christmas Bird Count, in addition to other duties. It would be difficult, without additional personnel and funding, to conduct an additional BBS route, determine sharp-tailed grouse and prairie chicken breeding sites, conduct passerine surveys on selected WPAs, to rewrite and update the Wildlife Inventory Plan, and to increase the overall quality and quantity of surveys completed in the WMD.

Cultural Resources

When ground breaking activities occur in the WMD for wetland restorations or other habitat manipulations, regulations covered under ARPA will be followed. Known cultural resources will be protected, but no effort will be made to investigate other sites. Interpreting these sites or educating others of their historical or cultural significance will not be a priority. No effort will be made to investigate a cooperative project with Sisseton-Wahpeton Sioux Tribe.

**Alternative A.
Current Management
(District) cont'd.**

Public Use

Waterfowl Production Areas are open to hunting, fishing, and trapping by statute. They are opened to other recreational activities only if they do not interfere with or detract from the purpose for which they were established, i.e. to provide habitat and breeding sites for waterfowl and other migratory birds. WPAs which adjoin fishable waters are open to fishing, though access is generally restricted to foot traffic only. No change would occur in providing these recreational activities on WPAs. Law enforcement assistance would continue to ensure compliance with State and Federal regulations.

With no Outdoor Recreation Planner on staff, educational and interpretive efforts fall to the regular staff. Few programs are currently offered in the WMD unless a specific request is made and staff is available. Providing and improving opportunities for wildlife observation, wildlife photography, environmental education and interpretation in the WMD is limited. Currently, only one or two school programs are normally provided each year, despite having 43 schools in the WMD. Educational programs for use on a WPA would not be developed. Interpretive kiosks for use on one or two well-traveled highways would not be pursued.

The volunteer program would continue at its current level with no additional funding or effort made to promote a more active volunteer corps or develop a Friends' group. Friends' groups have been shown to be very successful in providing additional sources of funding and expanding community support for Refuge programs.

Alternative B. Tallgrass Prairie Alternative

Before European settlement, the Great Plains were once the continent's largest ecosystem, covering nearly one quarter of the lower 48 states. These once vast grasslands were home to bison, elk, prairie wolves and other animals and birds adapted to this open landscape. Very little of this once thriving ecosystem still exists in a functioning form, mostly due to fragmentation and decreasing biodiversity resulting from agriculture, development and nonnative plantings. In recent years, grassland bird species have shown the most consistent and widespread declines of all migratory birds (Knopf 1994).

**Alternative B.
Tallgrass Prairie**

The grasslands, in their native form, comprise three regions: short, mixed and tallgrass prairies, depending on the species the soils and climate would sustain. In Waubay WMD, tallgrass prairie covered much of the WMD east of the Prairie Coteau in what is known as the Minnesota-Red River Lowlands. Less than 4 percent of the original tallgrass prairie exists today, much of it converted to cropland and other agricultural uses.

The tallgrass prairie alternative would focus on protecting any remaining native tracts, restoring diversity to degraded grassland sites, replanting croplands to native grasses and forbs, and enhancing and maintaining these sites to support a functioning prairie ecosystem. Protecting and restoring native grasslands will benefit waterfowl, although to a lesser extent than in areas with higher densities of wetlands. Other grassland-dependent birds and wildlife species will also benefit from the protection and restoration of this quickly disappearing habitat.

Waubay National Wildlife Refuge

Habitat

In order to concentrate protection, restoration and management efforts in the WMD, especially in the target area of the Minnesota-Red River Lowlands, activities and management on the Refuge would be reduced to minimum levels.

**Alternative B.
Tallgrass Prairie
(Refuge)**

Since acquisition of the Refuge is complete within the approved boundary and the Refuge lies in the Coteau des Prairie and not in the target area for this alternative, no protection or acquisition of grasslands would be needed. Native grasslands on the Refuge tend to be mixed (tall and short grass species) rather than true tallgrass prairie and so would not warrant special treatment under this alternative. Restoration of croplands, or tame or degraded native grasslands would occur secondarily to efforts in the Minnesota-Red River Lowlands. Management of native grass sites on the Refuge would continue, but at a minimum level in order to focus attention on tallgrass prairie sites.

Since all wetlands on the Refuge are protected or have been restored, no need exists for these activities under this alternative. The two wetlands with water control structures will be allowed to fluctuate naturally and will not receive water-level manipulation.

Restoration and management of Refuge woodlands would not occur as efforts would be directed towards protecting, restoring and managing tallgrass prairie sites.

Wildlife

Threatened and endangered species would be documented, but additional surveys or inventory plans will not be initiated. Surveys and monitoring would be minimized on the Refuge since it would be more important to document wildlife changes where increased protection, restoration and management activities were occurring.

Cultural Resources

Minimum requirements will be followed with regards to ARPA regulations when ground breaking activities occur. Additional inventories and upgrading of educational messages would not be accomplished under this alternative.

Public Use

Current hunting and fishing seasons would continue with no effort to expand or offer more accessible opportunities. No changes would be made to provide additional trails or other wildlife observation opportunities or to increase the number or types of educational programs offered, whether on or off the Refuge.

A strong volunteer base and program would be needed to conduct management and restoration activities and to promote the Tallgrass Prairie Alternative goals and objectives. Development of a Friends group would help to further the goals of this alternative and would be able to provide additional funding sources to implement recommendations.

Waubay Wetland Management District

This alternative would increase protection, restoration, management and wildlife monitoring efforts in the Minnesota-Red River Lowlands, where tallgrass prairie historically occurred. Other parts of the WMD would receive minimal attention in terms of management and wildlife monitoring. Opportunities for public use would remain the same in areas outside the target area and would increase in areas targeted for increased acquisition in order to protect and restore tallgrass prairie.

**Alternative B.
Tallgrass Prairie
(District)**

Habitat

Protection of tallgrass prairie would be accomplished through fee-title acquisition, easements or through partnerships with State, Tribal or private organizations. An emphasis would be placed on acquiring all remaining native prairie tracts, especially those that are high quality or requiring special or immediate protection for migratory birds. The area targeted for increased acquisition and easements would be the Minnesota-Red River Lowlands, the historic location of tallgrass prairie in the WMD.

Under this tallgrass alternative, criteria to purchase fee-title lands or easements would not be based on the Waterfowl Breeding Pair Distribution map as the benefits would not be limited to or targeted for waterfowl. LWCF or other funds would be used as much of the targeted area ranks low for duck pairs per square mile, but still attracts 20 to 29 duck pairs/sq. mile. We would expect more pairs to be attracted to this area as tallgrass prairie and wetlands are restored. Additional benefits of restoring large tracts of native prairie include increasing biodiversity and providing breeding, feeding and resting habitat for grassland-dependent species, particularly migratory birds. Nesting success should also increase as grassland tract size increases and edge effects minimized (Johnson and Temple 1990).

Increased restoration of degraded grasslands and croplands also would occur under this alternative. Acquiring these lands in fee-title would enhance our ability to restore these lands completely and to provide a larger functioning unit. Technical assistance and incentives would be provided for landowners to improve lands in private ownership or under easement. To facilitate this, alternative farming practices would be encouraged such as development and planting of native seed stocks and seed cleaning and processing plants. All croplands on grassland easements and new WPAs, as well as a minimum of 1,000 acres of tame grasslands on lands owned in fee-title, would be converted to native grasses and forbs.

Management of native and restored grasslands in the Minnesota-Red River Lowlands would be aggressive using fire, grazing and haying to restore, rejuvenate and maintain tracts in good-to-excellent condition where possible. Monitoring of all sites would be essential for tracking progress and maintaining optimum plant and wildlife diversity. Management of fee-title and easement lands outside the target area, especially tame grasslands, would decrease accordingly.

Included in this alternative would be an effort to provide corridors between fee-title and other protected lands by acquiring grassland easements. Lower quality grasslands would be acceptable for this effort. This objective would help to accomplish the goal of reestablishing larger, contiguous blocks of habitat for the benefit of declining grassland bird species, waterfowl and other prairie-dependent wildlife.

In this alternative, wetlands would also be protected and restored, but the emphasis would be placed on protecting and restoring wetlands in the Minnesota-Red River Lowlands. All methods would be used to protect wetlands including acquiring in fee-title, through easements or through partnerships. All wetlands in fee-title or under easement would be restored and incentives would be provided to landowners to restore those in private ownership.

Private landowners, watershed groups, Conservation Districts and other partners would be encouraged to create additional wetlands, through the private lands program, again targeting historic tallgrass prairie areas.

Management of wetlands with water control structures on WPAs would be reduced and allowed to fluctuate with naturally occurring habitat changes in order to concentrate our efforts on tallgrass prairie restoration and protection in the Minnesota-Red River Lowlands. Sites for future water management structures would only be considered in the target area to provide additional habitat for shorebirds and other wetland-dependent birds.

Since the focus of this alternative is restoration and protection of native prairies, native woodlands in the WMD would not be targeted for protection, nor would their importance to migratory birds be researched.

Wildlife

Documentation of threatened and endangered species would be tracked, but at minimum levels. Inventory and monitoring plans would not be developed for these or other species of management concern. Protection and monitoring of native fisheries would also be diminished.

Wildlife monitoring, in areas outside the Minnesota-Red River Lowlands, would decrease. Staff will be concentrating efforts on tracking changes in wildlife populations due to increased management and restoration of grasslands. Surveys outside the target area would be reduced to absolute minimum levels.

Cultural Resources

ARPA regulations would be complied with when developing water control structures, restorations or other ground breaking activities. However, no effort will be made to investigate other sites or to interpret known resources.

Public Use

An increase in fee-title lands through this alternative would provide expanded opportunities for public use. As WPAs, these lands would be open to hunting, fishing, wildlife observation and other compatible uses.

Development of an education/visitor/research center within the Tallgrass Prairie Ecosystem would be used to educate the public and provide a place for long-term studies on the dynamics and richness of this threatened habitat. Interpretive and educational programs and special events programming would be minimized to focus staff energies on the tallgrass prairie.

Alternative C. Enhanced Management (Proposed Action)

To achieve our purpose and goals, management of the Complex would be much more aggressive and proactive. Many of the goals would be achieved through the support of private landowners, reducing the need for increasing Federal landownership. Fee-title lands would be managed and monitored more aggressively to maintain higher quality habitat and to address problems before serious degradation could occur. Public use and recreation would be expanded to provide additional and improved educational experiences for visitors.

**Alternative C.
Enhanced Management
(Proposed Action)
(Refuge)**

Waubay National Wildlife Refuge

Management of Refuge habitats would be aggressive with increased monitoring to track progress towards management goals. All tame grasslands would be converted to native stands and native grasslands would be enhanced by eliminating or controlling brush, trees, weed, or tame grass infestations. Management objectives would be developed for individual habitats and water control structures on the Refuge. Woodlands would be restored to reduce edge effects and brown-headed cowbird populations. The Refuge Wildlife Inventory Plan would be rewritten to increase the quality and quantity of surveys completed on the Refuge. Archaeological resources would be protected and interpreted to develop a respect for other cultures and peoples. Hunting opportunities would be augmented by offering youth hunts or hunts for people with disabilities. Opportunities for wildlife observation, wildlife photography, environmental education and interpretation would be expanded. A more active volunteer program would be developed and promoted.

Habitat

Since acquisition of lands within the approved boundary is complete, no effort is needed to protect additional grasslands. To improve the quality and quantity of grasslands within the Refuge, approximately 262 acres of tame grass, dense nesting cover, and old alfalfa fields would be converted to native grass communities over a period of 10 years to make sure plantings are successful and to closely monitor weed infestations. Tame grasslands not yet converted will be managed for maximum potential height and density to provide nesting habitat for waterfowl and other grassland nesting birds. An increased effort will go into eliminating or controlling Russian olive and juniper stands, and other nonnative invading plants. Biological controls will be emphasized to reduce the use of chemicals and negative effects to native forbs.

All grasslands will be enhanced by developing a Habitat Management Plan with management goals, site plans, biological inventories and monitoring methods to optimize management and track progress towards meeting objectives. Management will be aggressive and timely to improve and maintain native grasslands at their optimal state and to minimize weed or other nonnative invasive problems.

There are three water control structures located on the Refuge. One is completely inundated by the extreme water levels and will not be replaced or repaired when water levels recede. Another, which affects approximately three acres, is located along the entrance road and is in need of repair. It will be replaced with an ordinary culvert to reduce maintenance problems and protect the road. The third is located on Barse Slough, a 15-acre wetland on the east side of the Refuge. Some minor repairs are needed to make this structure fully functional. A site plan will be developed for this structure to cycle the wetland through different stages (dry, regenerating, lake and degenerating) to improve productivity. Many of the wetlands on the Refuge have been in a high water cycle for 4 to 5 years with a resulting loss of invertebrates and emergent plant growth. Macroinvertebrates are extremely important for waterfowl, especially for egg production, ducklings, and feather growth. By allowing wetlands to go through a drying period, vegetation and invertebrate populations will change. Productivity is usually highest the first few years after drying and reflooding a wetland, resulting from a release of nutrients in the soil and decomposition of flooded vegetation (Baldassarre and Bolen 1994). Stable water conditions result in slower and even arrested decomposition rates and productivity (Ruttner 1953).

**Alternative C.
Enhanced Management
(Proposed Action)
(Refuge) cont'd.**

Approximately 500 acres of native woodlands occur on the Refuge. Both oak savannah eastern deciduous forest types are represented. Early in the Refuge's history, three fields (50 acres total) were cut out of woodlands to provide food plots for wintering deer. As water levels rose, these plots were planted to alfalfa to reduce maintenance needs. These farm fields would be replanted with native tree species to shorten the length of time needed for restoration of these woodlands. Replanting these areas will reduce edge effects and increase the size of intact woodlands. Nest predation is higher and success lower near forest edges than in the interior of a forest patch (Dobkin 1992). Brown-headed cowbirds comprised the second most numerous species on point counts and the fourth most numerous in captures for a banding and point count study conducted in Centerwoods from 1994 to 1996 (Refuge files). Restoration of Refuge woodlands could increase nesting success and reduce populations of brown-headed cowbirds and their effect on nesting success. Point counts would be used to monitor changes in bird populations.

Management plans would be developed to enhance the success of restoration and to improve the management of wooded areas on the Refuge. Forestry experts would be consulted to determine the best tools to enhance and maintain this unique habitat. The existing 60 acres of food plots outside the woodlands would be maintained to reduce negative impacts of wintering white-tailed deer on understory. Using GIS/GPS to accurately map forest types and management actions will greatly improve managers' ability to track changes and monitor success. Researching the effects of wintering deer on Refuge forests will improve our ability to develop strategies to minimize these impacts.

Wildlife

An inventory and monitoring plan would be developed for threatened and endangered species, including bald eagles, piping plovers, American burying beetle, and western prairie fringed orchids. A monitoring plan would also be developed to locate and track State species at risk, including regal fritillary, Dakota, and powesheik skipper butterflies; osprey; northern redbelly snakes; banded killifish; and central mudminnows.

**Alternative C.
Enhanced Management
(Proposed Action)
(Refuge) cont'd.**

Although a great deal is known about wildlife species on the Refuge, particularly for passerines and waterfowl, changing habitat conditions may be causing changes in species harder to detect. Good baseline and ongoing surveys are needed to document these variations especially for waterfowl, reptiles, amphibians and insects, including the Dakota skipper butterfly (a species found on the Refuge which was a candidate for listing). Being able to detect differences in species numbers or composition may help to indicate habitat changes not easily observed. To accomplish this, the Refuge Wildlife Inventory Plan would be rewritten.

Continued cooperation in national surveys such as National Audubon Society's Christmas Bird Count may help to detect more widespread changes in wintering bird populations. Working with South Dakota Game, Fish and Parks on deer surveys and population management will help to keep deer populations at manageable levels and maintain hunting opportunities.

Cultural Resources

In 1981, Keller and Zimmerman conducted a complete archaeological study of Waubay National Wildlife Refuge. Other studies have been conducted in and around the Refuge since the 1890s, many to identify significant cultural resources on Federal lands or before undertaking any projects where Federal funds were involved (Jackson and Toom 1999). A total of 27 archaeological sites have been recorded on the Refuge: 14 with prehistoric components and 13 historic sites. An effort will be made to locate these sites so that they may be protected from inadvertent activities. Sites that may be underwater can no longer be protected, but an effort would be made to monitor receding water levels and exposed shorelines for artifacts that may appear.

One outdated exhibit used to interpret cultural resources exists on the Refuge. It is part of a rotating system of signs used in outdoor kiosks. A new exhibit interpreting cultural resources was left out of the finished plan for the Visitor Center when considering maintenance (of the planned exhibit) and dollars available. Under this alternative, a new exhibit would be designed for the Visitor Center if space is available after renovation. With all kiosk signs in need of updating and replacement, special effort would go into developing one for interpreting cultural resources. This would give visitors a better "sense of place" and its enduring 12,000+ year history, a history that is in danger of being lost unless an effort is made to protect, preserve and interpret these resources. Staff would also consider developing an interpretive site with the Sisseton-Wahpeton Sioux Tribe, either on the Refuge or at a site nearby on tribal lands. A shared interpretive site with the Tribe could help in decreasing racial tension and cultural misunderstandings for visitors and local inhabitants alike.

Public Use

White-tailed deer hunting is the only hunting allowed on the Refuge. Three different seasons and types of hunting (archery, rifle and muzzleloader) are used to control wintering deer populations. Limiting the number of licenses available and access to vehicles helps to provide a high quality hunt not available on other public lands. With current water levels, access is even more restricted with some areas only reachable by watercraft. Although this limited access is somewhat controversial, thousands of acres of other public lands exist that can be hunted by less strenuous means. We believe it is more important to provide a quality hunt that is different from that on other public lands. By restricting vehicle access and allowing only non-motorized boats, fewer hunters are usually encountered by those who hunt here and wintering wildlife are less disturbed.

**Alternative C.
Enhanced Management
(Proposed Action)
(Refuge) cont'd.**

The Refuge muzzleloader season is offered before the rifle season, which is different than what the State offers. The state-wide black powder rifle season is offered in December for most public lands. Hunters may use black powder rifles during the regular rifle seasons, but few hunters do. A December hunt takes away the opportunity for these primitive weapons hunters to hunt during the rut and often subjects them to harsher weather conditions. We will continue to offer an earlier season for muzzleloaders as it is quite popular and provides another unique hunting experience.

Under this alternative, staff will also consider providing special hunting experiences for youths or the physically challenged. Hunters with disabilities have extremely limited opportunities in this area. Staff will investigate Refuge sites suitable to these hunters. Providing a youth hunting day or week can provide a stress free opportunity for youths to learn deer hunting techniques or further their experience.

Before 1995, Refuge lakes could not support a fishery. Lakes were too small and shallow and would often winterkill. Since Waubay Lake has joined up with Spring and Hillebrand's Lakes, these waters now support healthy and thriving populations of northern pike, walleye, perch, crappies, bullheads, rock and white bass, among others. The portion of Waubay Lake outside of the Refuge attracts thousands of anglers each year, year-round.

Waubay National Wildlife Refuge was established as "a refuge and breeding ground for migratory birds and other wildlife." Refuge waters and uplands are used by migrating and breeding waterfowl and other migratory birds. Average duck numbers per month can vary from near 100 to over 5,000 in the course of a year (Refuge files). Although higher water levels have changed waterfowl use somewhat, surveys in 1998 show duck numbers varied from a high of 540 in April to a low of 148 in August. These numbers do not include other water birds that use the Refuge. Numerous studies have shown that fishing and other human activities can disturb feeding and nesting waterfowl (Johnson 1964; Braun et al. 1978; Mendall 1958; Vander Zouwen 1983). For these reasons, boating and spring and summer fishing is incompatible with the purposes for which the Refuge was established and is, therefore, not permitted.

Ice fishing is presently allowed on the Refuge and would continue under this alternative. There are few direct impacts to wildlife with this activity. There was a concern about disturbance of wintering white-tailed deer, however, so activities are limited to foot travel, with no motorized vehicles. This accomplishes a number of things. It reduces disturbance to deer which helps to keep them on the Refuge instead of foraging on private lands, it is self-limiting - those who prefer to drive to ice fishing locations must go somewhere else, and it helps to preserve the wild and peaceful nature of the Refuge setting. Refuge restrictions offer anglers a unique experience that can't be found on the numerous other public waters.

Currently, only one or two special events are offered each year, usually National Wildlife Refuge Week and the Christmas Bird Count. Presenting additional programs throughout the year will help to bring visitors to the Refuge and foster a greater appreciation for the resources Refuges have to offer, especially for public use and education. Ideally, four special events would be hosted each year under this alternative.

**Alternative C.
Enhanced Management
(Proposed Action)
(Refuge) cont'd.**

Although the Refuge is within 30 miles of six schools, few educators take advantage of the resources the Refuge has to offer. Oftentimes, teachers do not feel they know enough to lead an educational program without staff assistance and, furthermore, staff are often not available to lead these programs. Educational programs that may be used with or without staff assistance would be developed and implemented to encourage more teachers to use the Refuge for science and environmental based curricula. The development of an outdoor classroom would be explored to draw in more educators, students, and volunteers. Such a facility could be used all year-round, with programs developed for each of the seasons.

Half of the Headquarters building is used for office space, the other half for visitor use and interpretation. Even with movable exhibits, this space begins to feel quite crowded with only 20 to 30 people. This severely limits the ability to present programs, or host open houses or meetings where more than 30 are expected. Staff generally make use of facilities off-refuge for events that draw larger crowds, but this doesn't work when staff would like to use the Refuge for part of the program or allow visitors to explore the Refuge after the program. The headquarters building would be expanded to give staff much more flexibility when developing or hosting presentations, meetings, interpretive programs, and other such events.

Many visitors come to the Refuge hoping to get out of their cars and do some exploring. Unfortunately, Waubay has only two short trails to offer visitors - the longest is ½ mile. Although these trails offer variety, nice scenery and good birding opportunities, neither is long enough for those who would like to spend more than a half-hour hiking. Under this alternative, one or two additional longer trails would be developed. Possible locations for longer trails include Headquarters Island to the west, West Woods (when water levels recede) and/or a grassland trail on the east side of the Refuge. The Headquarters Island site also offers the opportunity to develop a short boardwalk and viewing/photo graphy blind near a wetland with wonderful wildlife viewing potential. Any of these trails would give visitors enhanced opportunities to explore and learn about Refuge habitats and wildlife.

Another potential trail site would be considered in the long-term future. Day County 3A was a north-south county road which cut across the western edge of the Refuge. Currently, this road is completely inundated within Refuge boundaries. When water levels recede - which may take 10 to 15 years - Refuge staff would consult with Day County officials to consider not reconstructing this gravel road, but using it as a biking or minimal use auto tour route. This would help to retain the remote and wild nature of the Refuge and could increase tourism by offering unique opportunities for wildlife observation and wildlife photography.

**Alternative C.
Enhanced Management
(Proposed Action)
(Refuge) cont'd.**

In order to achieve many of the goals, more people are needed. Therefore, an active volunteer program would be developed to help accomplish some of the goals without the added burden and tax dollars needed to hire staff. Getting local communities and people involved in Refuge goals would give them a sense of ownership. This would help the Refuge as the local community would care more about the Refuge and the environment and how it is protected and promoted. Local communities would benefit by drawing in more tourism and preserving the quality of life. Developing a Friends' Group would give the Refuge an outside voice and additional ways of generating dollars for projects, programs, and improvements. Again, the local economy would benefit by an increase in tourism and the preservation of a healthy environment. Visitors who enjoy their experience will spend more time and may return with others in tow. Many opportunities are missed to promote the Refuge because of a lack of dollars or staff. An active volunteer program and a Friends Group can help to recoup these missed opportunities and turn them into achievements.

Waubay Wetland Management District

Protection, restoration, and management of vital habitats would continue, but by enlisting the support of private landowners through easements, incentives and other private lands based programs. Management of fee-title lands would be more aggressive with stated objectives and plans for specific tracts, with monitoring used to follow progress and adapt management if needed.

Restoration, creation, and sound management of wetlands with water control structures would also occur under this alternative. The uniqueness of native woodlands would be explored and these habitats protected where necessary. The knowledge base of wildlife populations would improve as the quality and quantity of inventories is increased. Recreational activities would continue with an increase in educational programs offered for WMD schools, and increased interpretive opportunities for visitors to WPAs.

**Alternative C.
Enhanced Management
(Proposed Action)
(District)**

Habitat

Fee-title grasslands make up less than 1 percent of total land area in the WMD. The only way to make an impact at the landscape level within the WMD is to enlist the support and interests of private landowners. Two efforts to protect grassland habitat would occur under this alternative. The first would be to continue the current grassland easement program, purchasing easements only from willing sellers and using the WBPD map to target areas important for waterfowl production. The other concurrent strategy would target tallgrass prairie remnants and would require alternative funding sources and rating criteria. This would help to protect the remaining 1 percent of original tallgrass prairie that remains.

Fee-title purchases would be limited to protecting high quality tracts or tallgrass prairie remnants in need of special protection. Acquisition would be limited to tract sizes of at least 160 acres to ease management and protect nesting birds from the negative edge effects of smaller parcels. Smaller parcels may be purchased if surrounding land uses (e.g., grassland easements or CRP) provide a larger overall protected grassland landscape. Development of a "Prairie Coteau Preserve" would be considered for protecting and increasing awareness of the importance of this habitat, and for providing environmental education and research opportunities and expanding tourism for this economically depressed area.

Conversion and restoration of croplands and poor quality tame grasslands on fee-title and privately owned lands would help to build connections and larger tracts of quality habitat. Incentives must be found to induce landowners to make these changes and to make it profitable for them in the long run. Management plans and monitoring would be conducted to keep track of vegetative and wildlife responses and to reduce problems before they get out of hand.

To enhance grassland condition, we would promote the use of grazing systems on private lands which not only improve pastures, but can increase weight gain of cattle, providing a natural incentive for landowners. We would also promote the use of late maturing legumes as an alternative to alfalfa to help improve nesting success of grassland birds and possibly reduce landowner workloads during busy spring seasons. Eliminating or controlling nonnative plants, especially with biological control methods, can improve the ecological diversity of habitats and reduce the use of potentially harmful chemicals in the environment. Bio-control methods can also reduce landowner costs and time spent spraying. We will continue to provide *Apthona spp.* (flea beetle) to private landowners and other State, local and Tribal agencies for biological control of leafy spurge and spearhead efforts to develop biological controls for Canada thistle and other nuisance weeds.

**Alternative C.
Enhanced Management
(Proposed Action)
(District) cont'd.**

There are 199 WPA units in the Waubay WMD. Many of these units are small and relatively unmanageable, i.e. are all water or inaccessible. Some sites have recently become unmanageable due to high water levels. In an average year and with current dollars and staff, 10 to 15 percent of uplands are managed in some form. A priority management list would be developed, better enabling managers to direct their time and energies to the best tracts, thereby improving or maintaining what will generally be larger tracts capable of sustaining greater diversity and wildlife populations. Even though this alternative and the CCP should strive to manage all lands under fee-title that can be managed, this is unrealistic and impractical. By developing this priority listing, as more dollars or staff are added more WPAs can be managed. Ranking criteria and the Priority Management List can be seen in Appendix H.

After determining where best to direct management efforts using the Priority Management List, the next step would be to develop Habitat Management Plans for each WPA. As each WPA varies in habitat, size, landscape location, developments, and management tools that can be used, developing individual site plans will help current and future managers know what the site has for resources, problems, cooperators, past management, and what worked and what did not. This is extremely valuable information that is currently held, for the most part, in the minds of current managers. This alternative would compel managers and biologists to document their efforts for the health of the land and for future generations.

Grasslands would also be enhanced by combining management units to develop larger blocks of habitat. This would involve divesting or exchanging lands to maximize management efficiency, help to restore a more natural ecosystem, and reduce edge effects which can be detrimental to nesting waterfowl and other migratory birds.

Maintenance of grasslands at optimum condition can only be attained through regular monitoring. Without monitoring there is no way to track progress to, or from, management objectives. Efficient, effective monitoring methods would be developed under this alternative to provide a biological basis for making and improving management decisions.

Developing a useful mapping system and combining these strategies of protection, restoration, and maintenance will help to reconstruct just a small portion of the once vast grasslands that covered the Great Plains and provided habitat for innumerable species of mammals, birds, insects, plants, and other wildlife. Providing larger tracts of grass and connecting these areas with corridors will help to restore a balance, lost since European settlement.

Wetlands are often considered swamps or nuisances and much effort has gone into draining them to provide more land for farming or development. In the past, government programs have even assisted in the demise of these valuable habitats. Wetlands can be some of the most productive ecosystems, providing food, cover, breeding, and resting areas for a variety of wildlife as well as providing flood control, filtration, water recharge, recreational opportunities, and food for humans. The ecological, economic and social benefits associated with wetlands are only now beginning to be appreciated. However, over 40 percent of South Dakota's wetlands have already been drained or filled since settlement, most in the last 40 years. Drainage occurs to this day, but programs to restore or create wetlands are gaining interest.

The majority of wetlands in northeastern South Dakota occur on private lands. In order to protect and perpetuate this resource, landowners must have incentives to do so. Purchasing wetland easements from willing landowners puts a dollar value on wetlands and allows the Service to protect wetlands in a cost effective manner. This alternative continues the wetland easement program at current levels, using the WBPD map and Small Wetlands Acquisition Program criteria to rate sites to protect wetlands biologically important to waterfowl.

**Alternative C.
Enhanced Management
(Proposed Action)
(District) cont'd.**

Fee-title purchases to protect wetlands would be limited to unique areas or sites that need special protection. They would also be limited to roundouts to existing WPAs or would have to be at least 160 acres in size and include or be near a variety of wetland types and sizes (a wetland complex). Smaller parcels are harder to manage and do not provide enough habitat to protect nesting birds from brood parasitism or predation (Johnson and Temple 1990). Waterfowl also need a variety of sizes and types of wetlands throughout their lives to fulfill critical needs (Baldassarre and Bolen 1994). Partnerships would also be explored for protecting unique wetland complexes and to protect important watersheds.

Restoration of wetlands would be an important part of this alternative. The private lands program would be instrumental in accomplishing this, as well as working with other agencies, Conservation Districts and private organizations. Wetlands on fee-title lands would be restored as soon as they are discovered. Easement wetlands will be restored as part of the purchase agreement.

Created wetlands can provide habitat for waterfowl and other wildlife while enhancing pastures for private landowners. Through the PFW program, small wetlands would be created on private lands. Since landowners can use these ponds for livestock watering, grass is more likely to remain the predominant land cover, which is more beneficial to wildlife than are crop fields.

Developing site plans for managed wetlands will enhance their productivity. A total of 16 wetlands with water control structures exist throughout the WMD. Since these water control structures are so widely spaced and in varying landscapes with a variety of wetland types and sizes, it would be difficult to provide habitat with these wetlands that could not be found somewhere else in the landscape. The management goal would be to make these wetlands more productive by cycling them through different wetland stages and monitoring vegetative and invertebrate response. Increasing the productivity of these wetlands should increase wildlife use.

A computerized mapping system, the single most useful tool for monitoring and maintaining wetland resources, would be developed. It would also help to identify sites for acquisition or easements or to facilitate information transfer to other agencies and individuals.

Native woodlands are a natural part of the landscape, occurring in the draws on the east slopes of the Coteau des Prairie and also at the edges of larger lakes and lake systems. Although these habitats make up a very small part of the Great Plains, wooded draws can attract a large number of bird species compared to other plains habitats (Dobkin 1992). Casual observations have found five species of warblers during spring migration as well as reports of turkey vultures and pileated woodpeckers in wooded coulees in Roberts County. Further research would probably find many more species using these important woodland habitats. This alternative would research the importance of these woodlands to migratory and breeding birds. An inventory and mapping of these woodlands would also help to document losses or changes to this habitat.

Wildlife

Although much is known about the wildlife species that occur in the WMD, an all out effort has not been made to document the presence and location of threatened and endangered species that may occur here. Under this alternative, a monitoring plan would be developed to locate and track specific locations used by endangered and threatened species, specifically the bald eagle, piping plover, whooping crane, eskimo curlew, interior least tern, American burying beetle, Topeka shiner, and western prairie fringed orchid. Developing and implementing inventory and monitoring plans for the above listed species is necessary to protect and promote these species as well as to reduce impacts and conflicts with normal management practices.

Since wildlife populations are dynamic and can be affected by factors such as weather, disease, pollution or other factors outside of human control, specific wildlife objectives have not been developed. It is especially impossible to develop wildlife goals for a wetland management district with hundreds of disjunct pieces of land spread throughout a wide range of habitats, land use, and even physiographic regions. This alternative would seek to increase the overall knowledge of wildlife species present so that intelligent decisions can be made regarding habitat needs and the development of models or the use of indicator species as a method of measuring the success of management goals and practices.

Cultural Resources

Although a recent study has been compiled for archaeological resources found in and around the Refuge, a similar study has not been done for the WMD. What sites are known in the WMD are usually discovered when water development or other ground breaking projects require a survey to comply with ARPA. This is probably the best way to find and survey for these culturally important sites considering the extent of the WMD and the impossibility of doing any other wide-ranging type study.

This alternative would recognize the importance of conducting more thorough studies at two known archaeological resource sites. Sites that have been identified would be inventoried, protected and monitored to ensure degradation by natural or other means does not occur. This alternative also presents an educational opportunity to interpret one of these sites - possibly in conjunction with the Sisseton-Wahpeton Sioux Tribe. Without developing these messages, this history may be lost which would be a great loss to current and future inhabitants of the Northern Great Plains.

Public Use

Hunting opportunities would continue to be provided on WPAs in accordance with State regulations, seasons, and recommendations for population goals (within Federal guidelines for migratory birds). The Service would continue to provide a somewhat "primitive" hunt by not providing any additional vehicle trails or other "improvements" on WPAs. Law enforcement assistance would be provided to ensure compliance with State and Federal regulations.

As WPAs, these lands are open to hunting, fishing, wildlife observation and other compatible uses.

Few educational and interpretive programs are currently offered in the WMD unless a specific request is made and staff is available. This alternative would improve this by actively promoting opportunities for environmental education, interpretation and other outdoor recreation. A minimum of 15 schools would be visited each year (out of 43) with an appropriate educational program presented. Additional programs would be developed for use on WPAs that are near schools that can be used with or without staff present. Interpretive kiosks would be developed on at least two WPAs located along well traveled highways to encourage travelers to stop and explore these little known pieces of the National Wildlife Refuge System.

V. Environmental Consequences

Alternative A. Current Management (No Action)

Waubay National Wildlife Refuge

Natural Resource Consequences

This alternative maintains the current grassland management strategies on the Refuge. Although much effort is put into maintaining this resource, with a staff stretched thin trying also to maintain 40,000 acres of WPAs, Refuge grasslands may slowly degenerate, mostly from the influx of nonnative grasses and brush. This in turn would have a negative effect on grassland bird species and native prairie insects such as the Dakota skipper butterfly which currently exists on the Refuge.

Without putting extra effort into restoring native woodlands, bird species may also suffer over the long-term from the negative impacts of brown-headed cowbird breeding activity and other negative edge effects.

This alternative would maintain current levels of public use which would have no additional impacts on natural resources in the Refuge.

Cultural Resource Consequences

Under this alternative, protection and interpretation of cultural resource sites on the Refuge would stay the same. Current known sites would be protected as part of the Refuge, but no effort would be made to reduce degradation over time from small animals, erosion, or other causes. There would be no effect on visitors as the current level of interpretation would remain the same.

Public Use Consequences

This alternative maintains the existing public uses on the Refuge and will have the least impact. It is believed that the current available use satisfies the demand for the most part, especially for deer hunting and wildlife observation. With increased fishing opportunities on Waubay Lake, some visitors have expressed an interest in summer and lakeshore fishing on the Refuge. This alternative would not address this issue and would result in a negative impact for increased fishing opportunities.

There would be no change in the education and interpretation programs offered. Visitors would notice no difference in the level of these services offered and would not be impacted.

Socio-Economic Consequences

Since all uses are maintained at current levels, there should be no socio-economic impacts under this alternative. This alternative does not increase infrastructure investment in the Refuge, nor does it increase Refuge staffing levels. The lack of these increases does not take anything away from the local economy, but at the same time, they do not add any extra opportunities.

By maintaining public use at existing levels, the current tourism contribution to the local economy from the Refuge should remain the same.

<p>Environmental Consequences Alternative A. Current Management (Refuge)</p>

Waubay Wetland Management District

Natural Resource Consequences

This alternative, by maintaining current grassland management strategies, should maintain most natural resources, but in the long-term may eventually result in a slow degradation of native prairie. A mix of management strategies, including rest, will provide habitat for many species including waterfowl and other migratory birds. However, by not pro-actively managing native prairie sites, the slow and inevitable encroachment of brush, tame grasses, and other exotics may eventually out-compete native species. These changes could be offset somewhat by continuing to protect and maintain habitat on private lands through easements and the Partners for Fish and Wildlife program.

No effort would go into determining the importance of, or protecting, native woodlands. It is unknown what impacts are currently occurring on native woodlands.

Continuing to protect and maintain wetlands and uplands will ensure healthy ecosystems which in turn provide clean air and water and maintain the quality of life for inhabitants.

Cultural Resource Consequences

This alternative maintains the current information base and minimum interpretation of prehistoric and historic resources. The Refuge has not had funds to conduct cultural surveys on selected WPAs. Cultural resources will be protected if they are on WPAs, but visitors will be unaware of this resource.

Public Use Consequences

This alternative maintains the existing public uses in the WMD. Public use of WPAs is heaviest in fall during deer, waterfowl, and pheasant hunting seasons. Some trapping occurs during winter months, but at relatively low numbers. It is believed that the current availability of WPAs satisfies the demand and, therefore, will have no adverse effect on public use.

This alternative will have no impact on visitors or local inhabitants as no change will occur in the existing use of WPAs used for education or interpretation and few visits are made to area schools for educational programs.

Socio-Economic Consequences

This alternative maintains the current management regime and, therefore, the current amount of economic use of WPAs would be maintained. Supplies necessary for management of public lands, e.g. gas, seed, fence posts, etc. will continue to be bought from the local area, maintaining current sources of revenue for area businesses.

There would be no change from the easement program. It would continue at current levels which provides additional sources of income for landowners while protecting habitat.

The private lands program would also continue at current levels under this alternative. There would be no change in economic effect as the current program levels of funding and staffing would remain the same. Providing public lands open to hunting, fishing and trapping will continue to offer economic benefits through license sales, hotel and restaurant visits and other sales associated with hunting or fishing. These benefits would remain at current levels with this alternative as no further improvements would be made or additional public lands purchased.

Protecting habitat and providing healthy ecosystems have additional socio-economic benefits such as providing clean water and air, reducing soil erosion, increasing flood control and increasing the quality of life. These tangible benefits, as well as more intangible ones, will remain the same under this alternative.

**Environmental Consequences
Alternative A.
Current Management
(District)**

Alternative B. Tallgrass Prairie Alternative

Waubay National Wildlife Refuge

Natural Resource Consequences

The tallgrass prairie alternative would focus staff time and dollars in the Minnesota-Red River Lowlands. As a result, restoration and enhancement efforts would suffer on the Refuge and the quality of grasslands would slowly degrade from encroaching brush and nonnative grasses. Wildlife diversity would also diminish over time under these conditions. Restoration of native woodlands would also not occur under this alternative. This would affect migratory bird species which may suffer over the long-term from the negative impacts of brown-headed cowbird breeding activity and other negative edge effects.

Cultural Resource Consequences

There would be no effect on cultural resources as this alternative would make no changes to existing policy, sites or interpretive displays.

Public Use Consequences

Public use on the Refuge would continue as it is currently. There would be no impact on visitors as they would already know what to expect. This alternative would not allow for increased hunting, fishing, wildlife observation or environmental education uses.

Socio-Economic Consequences

This alternative will concentrate staff efforts away from the Refuge. Therefore, few improvements will be made to Refuge lands, buildings, interpretive or educational programs. New opportunities for improving visitation and tourism will not be explored. This will have a negative effect on visitors and community members who will not benefit from the increased spending that could occur with these improvements.

Waubay Wetland Management District

Natural Resource Consequences

This alternative would increase protection, restoration, management, and wildlife monitoring efforts in the Minnesota-Red River Lowlands in order to restore a part of the vanishing tallgrass prairie ecosystem. This would improve habitat and natural resources in the target area, but would have negative effects elsewhere in the WMD.

Land use in the Minnesota-Red River Lowlands is primarily cropland. By returning much of these lands back to grasslands and restoring wetlands, wildlife populations should increase dramatically in this region. Over the long-term, habitat in the rest of the WMD will degrade from a lack of management and wildlife use in this area will probably become less diverse.

No effort would go into determining the importance of or protecting native woodlands. It is unknown what impacts are currently occurring on native woodlands.

Overall air and water quality should increase, improving the quality of life for wildlife and human inhabitants.

Cultural Resource Consequences

This alternative maintains the current information base and minimum interpretation of prehistoric and historic resources. The Refuge has not had funds to conduct cultural surveys on selected WPAs. Cultural resources will be protected if they are on WPAs, but visitors will be unaware of this resource.

**Environmental Consequences
Alternative B.
Tallgrass Prairie Alternative
(Refuge/District)**

Public Use Consequences

Under this alternative, more fee-title lands will be bought, increasing the availability of public lands for hunting and wildlife observation. Restoring tracts of grasslands and wetlands will also increase wildlife use, particularly waterfowl, which would also provide more hunting opportunities.

**Environmental Consequences
Alternative B.
Tallgrass Prairie Alternative
(District) cont'd.**

Development of an education/visitor center to interpret and research the tallgrass prairie would provide new opportunities for education and interpretation. However, efforts here would be offset by fewer events and programs offered by staff elsewhere in the WMD.

Socio-Economic Consequences

This alternative would increase the purchase of fee-title and easements in the target area. This could have a negative effect on the tax base of the affected counties since Congress has yet to fully appropriate funds for Refuge Revenue Sharing payments. Although additional funding has been provided in the form of the Revenue Sharing Trust Fund to make up the shortfall, there is still a negative impression of Federal land purchases. However, these affects may be offset by an increase in tourism dollars generated by more public lands available for hunting and wildlife observation. Air and water quality would be improved, providing both tangible and intangible benefits and improving the quality of life for residents.

Management of newly purchased lands would increase in the target area. Local economies would benefit from the increase in grass seed purchases as well as gas, pesticides and other items needed to restore and maintain these lands.

The use of prescribed fire may cause concern for local residents over the possibility of an escaped wildfire that burns onto adjacent private land. The Refuge fire program will continue to minimize the risk of escapes by adhering to Service policy which requires that a prescribed burn plan be approved before any prescribed burning takes place. The burn plan addresses the potential for escape and specifies the personnel and equipment needed, weather requirements, contingency plans, and many other aspects of the burn to ensure it stays within prescription. Additional personnel and equipment necessary to conduct prescribed burns will benefit the community by being available to assist local rural fire departments in the suppression of lightning and human caused wildfires that occur in the local area.

Alternative C. Enhanced Management (Proposed Action)

Waubay National Wildlife Refuge

Natural Resource Consequences

This alternative would maximize efforts to manage and enhance habitats on the Refuge. Higher quality and more diverse habitats would result. This in turn would attract more diverse and healthier wildlife populations - restoring the natural ecosystem balance. Grassland, wetland, and native woodland species would benefit. Restoring this balance would also reduce the need for continual chemical and mechanical manipulations saving fuel, soil, and nonmarket species.

Cultural Resource Consequences

This alternative would protect all identified cultural and historical resources found on the Refuge. Developing interpretive signs and programs would increase the public's understanding and awareness of these resources and their need for protection.

Public Use Consequences

This alternative would increase hunting and fishing opportunities, particularly for youths and people with disabilities. An improved trail system would be developed encouraging longer stays and greater appreciation for wildlife and their habitats. Developing more special events would also promote public participation and increase visitation to the Refuge and surrounding area.

This alternative would also improve interpretation and environmental education programs. Educators would have a number of programs to choose from, whether on or off Refuge and led by themselves or with staff assistance. Both children and educators would benefit from these increased resources.

Socio-Economic Consequences

Increased management efforts will benefit local economies through an influx of dollars for supplies, fuel and equipment. To address the needs of this alternative and the increased work load, the Complex will have to hire more personnel. Salaries of additional staff will also add to the local economy.

The use of prescribed fire may cause concern for local residents over the possibility of an escaped wildfire that burns onto adjacent private land. The Refuge fire program will continue to minimize the risk of escapes by adhering to Service policy which requires that a prescribed burn plan be approved before any prescribed burning takes place. The burn plan addresses the potential for escape and specifies the personnel and equipment needed, weather requirements, contingency plans, and many other aspects of the burn to ensure it stays within prescription. Additional personnel and equipment that is necessary to conduct prescribed burns will benefit the community by being available to assist local rural fire departments in the suppression of lightning and human caused wildfires that occur in the local area.

Increased public use on the Refuge will benefit local economies with increased spending on lodging, food, fuel, and other needs of visitors.

Information gained from cultural and historical sites would be used for interpretation and environmental education programs. Preserving the historical and cultural values of this area will benefit residents and tourists by developing a greater awareness of the history of this area and the people and cultures that lived here. Partnering with the Sisseton-Wahpeton Sioux Tribe to tell part of this story would benefit tribal members and residents by decreasing racial tension and cultural misunderstandings.

**Environmental Consequences
Alternative C.
Enhanced Management
(Proposed Action - Refuge)**

Waubay Wetland Management District

Natural Resource Consequences

This alternative would increase management and restoration of habitats and monitoring in the WMD. This would result in improved grasslands, wetlands, woodlands, and wildlife populations. Water and air quality would also improve, providing a greater quality of life for residents.

**Environmental Consequences
Alternative C.
Enhanced Management
(Proposed Action - District)**

Improved habitats, especially grasslands, could help stem the tide of decreasing migratory grassland bird species. Restoration of native grasslands will also help to perpetuate this declining habitat. Increasing efforts to reduce and control exotic species will improve the overall quality and diversity of grasslands. Healthier ecosystems will require less chemical and mechanical manipulations saving fuel, soil and nonmarket species.

Enlisting the support of private landowners in improving and restoring grassland and wetland habitats will make a bigger impact on the landscape than Federal protection alone could accomplish.

Cultural Resource Consequences

This alternative would identify, inventory and protect cultural resources on WPAs. Studies would be initiated on two WPAs with known resources, and additional sites as needed. There would also be an increased effort to interpret these resources, possibly in conjunction with the Sisseton-Wahpeton Sioux Tribe. By educating others about the significance of these resources we improve the chances that these resources will be protected and valued now and in the future.

Public Use Consequences

This alternative will improve current public use in the WMD. Few if any additional lands will be purchased under fee-title, maintaining current levels of public lands available for hunting and wildlife observation. However, improving federally and privately owned lands may provide greater and more diverse wildlife populations for consumptive and non-consumptive uses.

A greater effort will also be spent on increasing and improving interpretation and environmental education programs in the WMD. The result of these efforts will be a wider and more appreciative audience of our natural resources and the Service's role in protecting and maintaining these resources.

Socio-Economic Consequences

Aggressively protecting, restoring and managing habitats in the WMD will provide numerous benefits for residents and visitors. Some of these benefits would include reduced flooding impacts and soil erosion, improved water and air quality, and increased recreational opportunities. Increased use and appreciation of these resources will attract visitors and tourism dollars as well as new residents.

**Environmental Consequences
Alternative C.
Enhanced Management
(Proposed Action - District) cont'd.**

Increased management efforts will also benefit local economies through an influx of dollars for supplies, fuel and equipment. To address the needs of this alternative and the increased work load, the Complex will have to hire more personnel. Salaries of additional staff will add to the local economy.

The use of prescribed fire may cause concern for local residents over the possibility of an escaped wildfire that burns onto adjacent private land. The Refuge fire program will continue to minimize the risk of escapes by adhering to Service policy which requires that a prescribed burn plan be approved before any prescribed burning takes place. The burn plan addresses the potential for escape and specifies the personnel and equipment needed, weather requirements, contingency plans, and many other aspects of the burn to ensure it stays within prescription. Additional personnel and equipment that is necessary to conduct prescribed burns will benefit the community by being available to assist local rural fire departments in the suppression of lightning and human caused wildfires that occur in the local area.

Native American tribes have a unique perspective of the history and resources of this land. Partnering with the Sisseton-Wahpeton Sioux Tribe to tell this story would provide benefits to tribal members and other residents by ensuring this cultural history is not lost. Sharing this history will lead to a greater understanding and appreciation of other cultures and help to reduce racial inequalities. This would also provide a unique opportunity for the Tribe, local communities, and the Service to increase tourism in this area.

Summary Comparison of Environmental Consequences:

Waubay National Wildlife Refuge Comprehensive Conservation Plan - Alternatives			
	<i>Alternative A Current Management (No Action)</i>	<i>Alternative B Tallgrass Prairie</i>	<i>Alternative C Enhanced Management (Proposed Action)</i>
HABITAT: Grasslands			
Protection	N/A	N/A	N/A
Restoration	0	-	++
Enhancement	-	-	++
HABITAT: Wetlands			
Protection	N/A	N/A	N/A
Restoration	N/A	N/A	N/A
Enhancement	0	0	++
HABITAT: Native Woodlands			
	-	-	++
WILDLIFE			
T&E species	0	0	++
Other wildlife	0	-	++
CULTURAL RESOURCES			
Protection	0	0	++
Interpretation	0	0	++
WILDLIFE-DEPENDENT RECREATION			
Hunting	0	0	+
Fishing	0	0	+
Other Uses**	0	-	++
Volunteers/Community involvement	0	+	++

KEY

- ++ strong positive effect
- + positive effect
- 0 no effect
- negative effect
- strong negative effect
- N/A not applicable

**wildlife observation, wildlife photography, environmental education and interpretation

**Waubay Wetland Management District
Comprehensive Conservation Plan - Alternatives**

	<i>Alternative A Current Management (No Action)</i>	<i>Alternative B Tallgrass Prairie</i>	<i>Alternative C Enhanced Management (Proposed Action)</i>
HABITAT: Grasslands			
Protection	0	++/--*	+
Restoration	-	++/--*	++
Enhancement	-	++/--*	++
HABITAT: Wetlands			
Protection	0	++/--*	+
Restoration	0	0	+
Enhancement	0	--	+
HABITAT: Native Woodlands	-	-	++
WILDLIFE			
T&E species	0	0	++
Other wildlife	0	++	++
CULTURAL RESOURCES			
Protection	-	-	++
Interpretation	-	-	++
WILDLIFE-DEPENDENT RECREATION			
Hunting	0	+	+
Fishing	0	0	+
Other Uses**	0	+	++
Volunteers/Community involvement	0	+	++

KEY

++ strong positive effect

+ positive effect

0 no effect

- negative effect

-- strong negative effect

N/A not applicable

* the effect will be positive in the target area, but negative elsewhere

**wildlife observation, wildlife photography, environmental education and interpretation

VI. Consultation and Coordination with Others

The planning team consisted of Waubay Complex staff and the Regional Office Planning Branch. A review team was made up of a variety of people including biologists and others from the U.S. Fish & Wildlife Service Regional Office, nongovernmental organizations and interested individuals. Special meetings were held with the Sisseton-Wahpeton Sioux Tribe and South Dakota Game, Fish and Parks to encourage their participation and to address issues of concern to them.

Public input was gathered on issues in the Complex at 29 public meetings, through leaflets and media news releases. People were given the opportunity to comment by writing, e-mailing or by speaking to Refuge staff either directly or by telephone.

Feedback was generally supportive of the majority of existing Complex management practices and programs. Socio-economic concerns in the area include wetland drainage and flooding, low farm prices and loss of tax base, wildlife depredation, weed control and public hunting/fishing access. For further discussion of issues raised, refer to "Planning Issues" In Chapter II.

Internal copies of this document were made available to Service staff for comment and review. This Environmental Assessment (EA) is the first opportunity that the Service, other organizations and the general public will have to review the entire planning effort. This Draft Plan, including the EA, will be made available to the public by June 2002. A 30-day comment period will be provided. A final Plan is expected to be released by September 2002.

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

