

Chapter 5. Environmental Consequences

This chapter discusses environmental consequences, which may result from carrying out the actions of each of the four alternatives. For a better understanding of why these effects may occur, refer to chapters 3 and 4. A description of resource conditions and interactions can be found in Chapter 4: Affected Environment. Chapter 3 (Alternatives) presents management objectives and strategies for each alternative, which could create the consequences described here.

This chapter discusses the effects of each alternative. The issues addressed were identified during the public scoping process as primary areas of concern to the public. For a more comprehensive list of impacts to each resource see tables 6.1-6.6 at the end of this chapter.

Effects Common to all Alternatives

All alternatives would have the same impacts related to air quality, environmental justice, and socioeconomics, as described below.

Air Quality

No adverse effects on air quality are expected. Short-term effects on air quality from prescribed burning on the refuge should not vary significantly among any of the alternatives.

Environmental Justice

None of the alternatives considered would pose adverse environmental effects on minority or low-income populations. There is no fee to enter the refuges; they are open to everyone.

Socioeconomic Impacts

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

Summary of Effects by Alternative

The following section and tables provide an analysis of effects resulting from the four alternatives.

ALTERNATIVE A—No Action

Wildlife and Habitat Management

Developed Wetlands

Continuing the current water management regime would reduce the potential for a botulism outbreak and dramatically lessen the severity of one, if it occurred. While other resource benefits may occur as a result of this management, they are not the primary target of water management planning and annual operations.

In the smaller Long Lake NWR impoundments, which are independent of Long Lake proper, the Service anticipates a positive impact on one or more of the following: waterfowl production, shorebird migration, waterfowl and sandhill crane migration, and production of wetland plant and animal foods.

Impoundments in the wetland management districts would continue to be managed in drawdown to simulate natural cycles of wetlands, and would therefore maintain high levels of productivity.

Wetlands without Water Control Structures

Since these wetlands are dependent on climactic conditions (i.e., periods of drought and deluge) it is not possible to tell what impacts would occur.

The Service's management of these wetlands will continue to consist of 1) maintaining perennial grass cover around their perimeters to minimize negative anthropogenic impacts (i.e., sedimentation); 2) allowing prescribed fire and permit grazing to consume wetland vegetation for the purpose of either nutrient recycling or noxious weed control, and; 3) actively managing noxious weed infestations (e.g., Canada thistle) in dry wetland basins or wetland edge areas.

Native Upland Habitats (including woody species)

As a result of this alternative the refuge would see a decrease in the number of invasive native and nonnative plants (including exotic plants) and shrubs and an increase in the growth of native plant species.

This effort would affect approximately 2,500 acres per year, altogether.

Disturbed Upland Habitats

Converting disturbed upland habitat to a cleaner, more natural habitat would increase the ability of migratory birds to use it as a nesting habitat

Nonnative Trees and Shrubs

The removal of volunteer trees and shrubs from grassland areas to retain the native, early-successional character of mixed-grass prairie would benefit grassland-dependent migratory birds (e.g., Baird's sparrow, marbled godwit, northern pintail). Additionally, the removal of select sentinel trees that serve as perches for various raptors (e.g., great horned owl, red-tailed hawk) would continue to have a positive impact on both migratory bird-nesting habitats and migratory concentration areas.

Predator Management

Maintaining the current level of predator management would allow the Service to continue targeting predators which harm wildlife, infrastructure and cause predation problems for adjacent landowners.

The Service's partnership with trappers does not have as great an impact on predators as is ideal because trappers are interested in predators only during periods when their fur is of value; however, this generally occurs in fall and winter when removal of predators is less effective in managing their populations than during the nesting season.

Wildlife Disease

Under this alternative, the Service's aggressive approach to monitoring and managing disease outbreaks, along with its water management agenda, would greatly lessen the possibility of disease outbreaks and dramatically lessen their severity, if they occur.

Public Use, Education, and Interpretation

Hunting

The hunting program on Service lands in the complex would continue to be valued as one of the six priority public uses and would provide hunters with ample opportunity to hunt without compromising Refuge System mission and goals.

Fishing

The fishing program on Service lands in the complex would continue to be valued as one of the six priority public uses and would provide fishermen/women with ample opportunity to fish

without compromising Refuge System mission and goals.

Environmental Education and Interpretation

The environmental education and interpretation program on Service lands in the complex would continue to be valued as priority public uses and would provide visitors with ample opportunity to learn about the refuges.

Wildlife Observation and Photography

Wildlife observation and photography on Service lands in the complex would continue to be valued as priority public uses and will provide visitors with ample opportunity to learn about the refuges.

Trapping

This alternative would maintain the trapping program at its existing level and would, therefore, provide limited assistance to predator management.

Research and Monitoring

Wildlife and Habitat

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

Socioeconomics

Under this alternative, research and monitoring of current socioeconomic conditions at the complex and in the communities surrounding the complex would continue to be negligible and would result in missed opportunities to educate the public on the purposes of the complex, the mission of the Refuge System, or to create new opportunities for partnerships, friends groups, and volunteers to the complex.

Cultural Resources

The Service would continue to place a high priority on documenting and protecting new cultural resources as they are found. Staff would also protect existing known resources from vandalism, theft, and destruction. Sites with historical significance would continue to be properly maintained and preserved.

Refuge Operations

Staffing

This alternative maintains staffing at existing levels (currently 8.8 FTEs). See table 1 for current staffing.

Operations and Maintenance

This alternative would continue with the current level of operations and maintenance, including the maintenance of equipment and vehicles in good working conditions to achieve management goals. Staff would continue to operate with available funding and resources.

Infrastructure

This alternative maintains infrastructure at current levels. For complete list of assets see table 1.

Partnerships

Existing partnerships allow complex staff to accomplish much more than they could in the absence of partnerships. Partnerships enable complex staff improved capabilities with respect to: 1) land acquisition; 2) research, monitoring, and inventory efforts; 3) outreach and public use activities, and; 4) habitat management activities.

ALTERNATIVE B—Natural Processes Management

Wildlife and Habitat Management

Developed Wetlands

The water management actions of alternative B would potentially result in a reduction in the degree that Long Lake's hydrology is altered; This, in turn, should increase the overall longevity of the system with regard strengthening its ability to provide suitable habitat for a variety of wetland-dependent wildlife and also improve other crucial wetland functions (e.g., groundwater recharge, nutrient cycling). Measurable changes to the system should be seen in decreased salinity, sedimentation, and dissolved solid accrual. A reduced ability to support fish would benefit Long Lake with respect to the reduction or elimination of turbidity problems caused by exotic roughfish (i.e., common carp).

There are also potential negative impacts to developed wetlands. The lower water levels and lack of management capability that will result from the removal of WCSs on Long Lake would decrease the Service's ability to manage botulism outbreaks. The removal of WCS on Long Lake NWR and

throughout the wetland management district would also reduce the Service's creative ability to managing the habitat for specific bird groups (e.g., shorebirds), as well as result in reduced acreage of managed semi-permanent wetlands. Another result of this management would be a reduced flood attenuation ability of the system.

Performing these actions would not only require an initial funding increase, but also may also require the acquisition of outlet and discharge permits. It is expected that the frequency with which Long Lake experiences drought conditions would increase, due to the Service's lack of ability to impound water. Lack of water storage capabilities would also impact what is currently a marginal fishery at Long Lake. A reduced ability to support fish would benefit Long Lake with respect to the reduction or elimination of turbidity problems caused by exotic roughfish (i.e., common carp). Finally, the lower mean water levels on Long Lake would result in an earlier mean freeze-up date, effectively changing Long Lake's capacity as a stopover and/or staging area for fall migrating waterfowl.

In addition to paralleling the activities outlined in alternative A, this alternative will explore the option of removing nonwetland substrate (via dredging) from wetlands that the Service determines to be heavily impacted by sedimentation.

Wetlands without Water Control Structures

Through these actions there is potential to increase wetland productivity (i.e., invertebrate and plant diversity), as well as improve overall wetland function (e.g., groundwater recharge, nutrient cycling, flood attenuation). Ultimately, these actions would help reverse or stall a trend of degradation and promote long-term system sustainability. Because of the increased wetland productivity that is possible through the implementation of these actions, it would be possible to support a greater diversity of wetland-dependent wildlife. Increased funding would be necessary to complete the dredging activities outlined in this alternative.

Native Upland Habitats (including woody species)

There is potential to increase acreage of native grasses and forbs, which would result in a corresponding decrease in acreage of nonnative grasses and forbs. The coverage of invasive native low shrubs (i.e., western snowberry, silverberry) would also be limited. Once some degree of success

is achieved, it is likely that, through continued management, the degree of future invasion would be minimized. A corresponding positive vegetative response would result in an improved breeding habitat condition for most native grassland-dependent species in the south-central portion of the State. This would increase nest densities and nest success for bird species. Potential would exist for less favorable breeding habitat conditions for certain species (e.g., clay-colored sparrow, exotic bird species). Because this alternative lacks structural criteria (e.g., height-density) for certain wildlife species or groups, its objectives (species composition-based) would likely be more achievable. Increased funding would be necessary to cover restoration and maintenance costs.

Disturbed Upland Habitats

There is potential to convert areas that are presently dominated by nonnative grasses and forbs to a native grass and forb-dominated vegetative community. Crop fields and DNC fields would be phased out and eventually eliminated from uplands within the complex. Once some degree of success is achieved it is likely that, through continued management, the degree of future invasion would be minimized. Additionally, habitat fragmentation would be reduced, as well as overall acreage of noxious weed species (e.g., leafy spurge, Canada thistle, absinth wormwood). Accomplishment of the above actions with a corresponding positive vegetative response would result in an improved breeding habitat condition for most native grassland-dependent species in the south-central part of the State. This would increase nest success and nest densities for bird species. Potential would exist for less favorable breeding habitat condition for certain species. Because this alternative lacks structural criteria (e.g., height-density) for certain wildlife species or groups, its objectives (species composition-based) are likely more achievable.

Nonnative Trees and Shrubs

The reduction of nonnative trees and shrubs would lead to a reduced invasion of nonnative flora. Breeding habitat would be improved for grassland-dependent bird species, including improved recruitment and overall abundance. Additionally, this management would promote more balanced predator/prey relationships through reduced predation rates (due to less fragmented habitats) and less favorable year-round habitat for certain problematic nest predators (e.g., skunk, raccoon).

Negative effects would include degraded habitat conditions for arboreal bird species (e.g., yellow warbler, black-billed cuckoo, willow flycatcher), as well as for the winter habitat of resident-bird species (e.g., ring-necked pheasant, sharp-tailed grouse). Elimination of nonnative tree and shrub plantings would also reduce the edge habitat favored by parasitic brown-headed cowbirds.

With regard to public use, these management activities could cause reduced hunting opportunities for deer and pheasants due to the loss of tree/shrub habitat. Therefore, any activities that involve the removal of trees (native or nonnative) are often controversial. Additionally, increased funding would be necessary to conduct these intensive management activities.

Predator Management

The actions in this alternative would promote improved breeding habitat conditions for grassland-nesting bird species (e.g., Baird's sparrow, northern pintail, marbled godwit), including improved recruitment and increased abundance. Trapping would result in a decreased in nest predators (e.g., skunks, red fox, raccoon), but could also result in artificially high populations of small mammals (e.g., shrew, vole) due to the removal of mid-sized predators. Removal of trees would result in less favorable habitat conditions for certain wildlife species (i.e., breeding arboreal birds, wintering deer and resident bird species). Increased funding would be necessary to conduct trapping and habitat restoration activities.

Wildlife Disease

The actions in this alternative could potentially cause an increased severity, longevity, and frequency of various disease outbreaks, resulting in reduced net recruitment and population size of various waterbird species (e.g., northern pintail, Wilson's phalarope, Franklin's gull). Lack of an active disease response could also send a negative message to the public (e.g., a passerby who notices concentrations of dead waterfowl in a Service-owned wetland along a roadway for an extended period of time). Conversely, lack of disease response would reduce time constraints on complex staff, as well as reduce annual funding needs.

Priority Population Issues

The above actions will potentially result in improved habitat and protection conditions for these priority wildlife species. The re-directed survey effort for piping plovers will help us locate

Service wetlands that were previously unknown to harbor breeding piping plovers, with a limited amount of effort. Piping plover habitat enhancement and nest protection efforts will potentially increase overall piping plover recruitment on lands in the complex. The enhanced protection efforts for fall migrant whooping cranes that utilize Service lands will reduce overall disturbance and the likelihood of accidental shootings. Initiation of systematic Dakota skipper surveys on priority lands in the complex, as well as an assessment of habitat conditions with respect to Dakota skipper habitat requirements will give us a better indication of whether this candidate species does occur on Service lands within the complex. The implementation of management guidelines will ensure that our upland management activities are not negatively affecting Dakota skippers on lands we determine to have suitable habitat.

Public Use, Education and Interpretation

Hunting

The actions in this alternative would potentially decrease hunting opportunities for certain species (e.g., white-tailed deer), and potentially increase hunting opportunities for other species (e.g., ring-necked pheasant, gray partridge, coyote). Possible liberalized season frameworks for certain species (e.g., ring-necked pheasants) might conflict with other hunting seasons (e.g., archery deer), as well as other wildlife management objectives (e.g., sanctuary for staging waterfowl). Implementation of a predator hunting season could potentially improve recruitment rates for waterfowl and other breeding bird species, depending on predator harvest levels. However, a predator hunting season, as well as other expanded hunting seasons would necessitate an increased law enforcement presence. Reduced trail access could impede hunters with limited mobility, but would also result in an improved hunt quality for many hunters due to restricted motor vehicle use.

Fishing

The elimination of boating would result in reduced disturbance to waterbirds and other wetland-dependent wildlife. However, it would also reduce the opportunity to participate in one of the six priority public-use activities.

Environmental Education and Interpretation

This alternative would result in an improved public understanding of the south-central portion of the State's natural history, wildlife biology, the history

and qualities of complex lands, and the mission of the Refuge System. This alternative would also provide a more natural experience for visitors. It would limit the amount of habitat impact caused by public-use activities and subsequently would avoid most compatibility concerns associated with facility and/or program development.

Wildlife Observation and Photography

Same as alternative A.

Trapping

Same as alternative A.

Research and Monitoring

Wildlife and Habitat

The Service would improve its understanding of upland management (e.g., burning, grazing, haying) effects on vegetative composition and structure throughout complex. It would also understand better how wetland management activities on Long Lake NWR affect the system's hydrology, water chemistry, and overall productivity.

Additionally, because this alternative would increase the extent of land being monitored for upland vegetation change (i.e., permanent belt transect establishment), it would result in an improved understanding of wildlife response to the Service's management activities. This, in turn, would correspond to better management decisions that target specific wildlife objectives. The end result would be improved habitat throughout the complex and a better ability to maintain and improve recruitment of various wildlife populations. Additionally, the Service would gain a better understanding of how human disturbance affects various wildlife groups. This would give the Service the opportunity to adjust public-use activities for the benefit of targeted wildlife species.

Socioeconomics

The availability and analysis of data on public uses and their wildlife-dependent recreational expenditures would allow complex staff to estimate the impact of its actions on local, municipal, and State economies and thus be able to garner support for the Refuge System. Furthermore, the data analysis would allow the Service to tailor public uses and facilities to meet the public's needs and expectations. This in turn could result in increased public participation in the complex and support for the mission of the Refuge System.

Cultural Resources

The Service would improve its knowledge of the locations and types of cultural resources on complex lands. This improved knowledge would give the Service the ability to preserve and restore various cultural resources. This alternative has the potential to improve certain aspects of the complex's habitat management, because areas of cultural concern will be identified. Additionally, this alternative increases the likelihood for more involved management schemes to protect cultural resources while accomplishing habitat management. A funding increase would accompany the actions in this alternative, to complete the inventory and cover excavation costs.

Refuge Operations

Staffing

Increased staffing would give the Service the ability to accomplish the goals and objectives of this alternative's management plans.

Operations and Maintenance

The increased resources that are requested in this alternative would allow the Service to accomplish the goals and objectives of this alternative. Increased funding for staffing, equipment, and supplies would be necessary under this alternative.

Infrastructure

The additional infrastructure that is requested in this alternative would allow the Service to accomplish the goals and objectives associated with other elements (e.g., wildlife and habitat management, public use, education and interpretation, research and monitoring) of this alternative. Increased funding for the construction of new infrastructure and the purchase of equipment and supplies would be necessary to meet the goals of this alternative.

Partnerships

Expanded partnerships would increase the Service's ability to restore altered ecosystems and habitats. It would also result in improved relationships with a greater number of private landowners, government agencies, and nongovernmental organizations. However, the increased partner load would create increased time constraints on complex staff. Additionally, the potential exists to alienate partners who have other ideas or motives that do not parallel the goals and objectives of this alternative.

Increased funding will be necessary in order to complete the new programs associated with the additional partnerships.

ALTERNATIVE C—Single Wildlife Group-level Intensive Management

Wildlife and Habitat Management

Developed Wetlands

Increased water management capabilities on Long Lake will improve the Service's ability to prevent and manage botulism outbreaks. It would also improve its ability to provide ideal habitat for a particular wildlife group (e.g., waterfowl). This includes the use of drawdowns to increase wetland productivity on portions of Long Lake and managed wetlands throughout the wetland management district. Additionally, Long Lake's flood attenuation capabilities have the potential to be enhanced through these actions. Performing these actions would not only require a long-term funding increase, but could also require the acquisition of permits related to water discharge and/or construction. These actions would likely give the Service tremendous flexibility with regard to dealing with periods of drought at Long Lake. Similarly, the Service would have a great deal of flexibility in managing Long Lake's fishery, including associated turbidity problems. Finally, the increased ability to maintain high water levels on Long Lake would result in flexibility related to fall freeze-up date, depending on the wildlife group that is steering water management.

Conversely, where intensive wetland management (i.e., impoundments) continues, or is further developed at Long Lake NWR, the Service expects continued and possibly accelerated alteration of the hydrology of Long Lake, which raises concerns about system sustainability.

Wetlands without Water Control Structures

There is potential to increase wetland productivity (i.e., invertebrate and plant diversity) through various management actions (i.e., drawdowns, dredging). Because of the increased wetland productivity and increased management flexibility that is possible through the implementation of these actions, it would be possible to provide ideal habitat for a specific wildlife group (e.g., shorebirds).

On wetlands that are managed via WCSs, however, there is potential for altered hydrology, which may lead to a reduction in system sustainability, in the

form of increased sedimentation, conductivity, and dissolved solids accrual. Conversely, on those wetlands selected for dredging, the Service could see a reversed trend of degradation, and improved wetland function and sustainability. Increased funding would be necessary for dredging activities, construction of WCSs and associated infrastructure, as well as annual operation and periodic maintenance.

Native Upland Habitats (including woody species)

The actions in this alternative would target improved breeding conditions for a specific wildlife group (e.g., grassland passerines). Through these actions there is potential to increase acreage of native grasses and forbs, which would result in a corresponding decrease in acreage of nonnative grasses and forbs. However, there is also potential to promote any productive habitat type if it benefits the target wildlife group. Therefore, if the target wildlife group's most suitable habitat consists of nonnative vegetation, little would be done to preserve native tracts. Potential exists for less favorable breeding-habitat condition for certain species that are not a part of the target wildlife group. Under this alternative, vegetative structure (i.e., height-density, litter depth) would be taken into consideration, in addition to species composition, when setting objectives for a particular wildlife group.

Increased funding would be necessary to cover the costs of intensive habitat management.

Disturbed Upland Habitats

This alternative's actions would target improved breeding conditions for a specific wildlife group (e.g., waterfowl). Through these actions there is potential to increase acreage of native grasses and forbs, or conversely increase the acreage of nonnative cover types (e.g., cropland, DNC) depending on the target-species group. Potential exists for less favorable breeding habitat conditions for certain species that are not a part of the target wildlife group. Consequences include possible increased fragmentation, noxious weed acreage, and invisibility of lands managed by the complex. Additionally, certain management practices may not maximize the land to its fullest wildlife potential. Under this alternative, vegetative structure (i.e., height-density, litter depth) would be taken into consideration, in addition to species composition, when setting objectives for a particular wildlife group. Increased funding would

be necessary to cover restoration and maintenance costs.

Nonnative Trees and Shrubs

Habitat changes could occur in two completely different directions depending on the target wildlife group (e.g., waterfowl). If nonnative trees and shrubs are removed the amount of contiguous grassland habitat would be increased, and the reduction of nonnative microclimates would lead to less overall invasion of nonnative flora. Breeding habitat would be improved for grassland-dependent bird species, including improved recruitment and overall abundance. Habitat conditions for arboreal bird species (e.g., yellow warbler, black-billed cuckoo, willow flycatcher) would be degraded, as well as winter habitat for resident bird species (e.g., ring-necked pheasant, sharp-tailed grouse). Elimination of nonnative tree and shrub plantings would also reduce the edge habitat favored by parasitic brown-headed cowbirds. Additionally, this management would promote more balanced predator/prey relationships through reduced predation rates (due to less fragmented habitats) and less favorable year-round habitat for certain problematic nest predators (e.g., skunk, raccoon).

With regard to public use, these management activities could cause reduced hunting opportunities for deer and pheasants due to the loss of tree/shrub habitat. Therefore, any activities that involve the removal of trees (native or nonnative) are often controversial.

Additionally, increased funding would be necessary to conduct these intensive management activities.

Conversely, if the habitat needs of the focus wildlife group warrant that existing trees and shrubs are left intact and possible additions of more trees and shrubs would be beneficial, then an entirely different suite of habitat, wildlife, and public-use impacts would prevail. Through additional shrub plantings, suitable habitat areas would be increased for breeding arboreal birds, as well as several resident wildlife species (e.g., white-tailed deer, ring-necked pheasants) during the winter. Additional plantings of nonnative trees and shrubs would reduce the acreage of native flora, as well as increase the degree site fragmentation and invisibility adjacent to new plantings. Amount of edge habitat would be increased, promoting the occurrence of parasitic brown-headed cowbirds. Additionally, the number and overall acreage of microclimates suitable for problem nest predators

would be increased, further exacerbating the problem of high nest predation rates. Breeding habitat conditions would be degraded for several bird groups (e.g., grassland passerines, upland nesting shorebirds, waterfowl).

With regard to public use, these management activities provide additional hunting areas for deer and pheasants due to the increase of tree/shrub habitat. Conversely, the birding community would likely see a loss in bird species diversity and diminished birdwatching experience.

Additionally, increased funding would be necessary to conduct tree and shrub planting.

Predator Management

The actions in this alternative would promote improved breeding habitat conditions for a particular group of ground and over-water nesting birds, including improved recruitment and increased abundance. Trapping would result in a decreased abundance of nest predators (e.g., skunks, red fox, raccoon), but may also result in artificially high populations of small mammals (e.g., shrew, vole) due to the removal of mid-sized predators. Removal of trees would result in less favorable habitat conditions for certain wildlife species (i.e., breeding arboreal birds, wintering deer and resident bird species). Additionally, the “large-block” trapping component of this alternative would include partner (e.g., Delta Waterfowl Foundation) and private landowner involvement and would hold the potential for improved Service/private landowner relations throughout portions of the complex. Increased funding would be necessary to conduct “large-block” intensive trapping and habitat management activities.

Wildlife Disease

With respect to botulism, the actions in this alternative could potentially reduce the severity, longevity, and frequency of outbreaks, resulting in an increased net recruitment and population size of various waterbird species (e.g., northern pintail, Wilson’s phalarope, Franklin’s gull) as compared to the no- action alternative.

The complex staff’s present disease response plan would be evaluated and, if necessary, improved. Increased funding to conduct research would initially be necessary, with the possibility of a long-term reduction in complex staff time and funding needs, depending on research results and

management implications. Also, if research conclusions recommend a “no action” response to botulism outbreaks, a negative message might indirectly be sent to the public (e.g., a passerby who notices concentrations of dead waterfowl in a Service-owned wetland for an extended period of time). Research conclusions would also likely result in improved use of staff time and funding.

Priority Population Issues

Same as alternative B.

Public Use, Education, and Interpretation

Hunting

The expanded hunting opportunities would potentially conflict with other recreational uses (e.g., birdwatching, photography) and/or wildlife management objectives. Additionally, the increased vehicle access proposed in this alternative would potentially reduce the quality of the experience for other hunters. Certain complex visitors might feel that the presence of hunting structures (i.e., blinds, stands) detracts from the naturalness of complex lands. The expansion of hunting areas and season would require an increased law enforcement presence. Increased funding would be necessary to pay for the increase law enforcement, to conduct special hunting programs (e.g., physically challenged hunts), improve existing and/or develop new roads/trails and hunting structure construction.

Fishing

Increased boat traffic would lead to greater disturbance to waterbirds and other wetland-dependent wildlife. The increase in fishing activity throughout the complex would also result in potential habitat degradation (e.g., littering, injection of motor fuels into water) and a need for increased law enforcement. Stocking of fish would create potential competition for the invertebrate resource between stocked fish and waterbirds. Conversely, this alternative would result in an increased opportunity to participate in one of the six priority public uses. A substantial increase in funding would be necessary for construction of boat ramps and access routes, docks, interpretive signage and materials, and an increased law enforcement presence.

Environmental Education and Interpretation

The public would gain an improved understanding of this area’s (south-central North Dakota) natural history, wildlife biology, the history and qualities of

complex lands, and the mission of the Refuge System. The Service would have the ability to host larger, more diverse groups of visitors due to new facilities. Wildlife observation opportunities would be improved at Long Lake NWR through an auto tour route, observation deck, and new and improved educational/interpretive materials. These changes would give the complex the potential to generate greater support for future complex and Refuge System programs.

Actions outlined in this alternative would increase the potential for conflicts and disturbance to wildlife, due to increased human activity and facilities at Long Lake NWR, Slade NWR, and Small WPA. Increased funding would be needed for facility and program development, as well as possible increased operations and staffing costs.

Wildlife Observation and Photography

The improved wildlife observation opportunities at Long Lake NWR would increase the potential for conflicts and disturbance to wildlife, due to increased human activity and facilities at Long Lake NWR. Increased funding would be needed for construction of new facilities, maintenance of these facilities, and possible staff increased necessary for maintenance of these facilities and operation of the increased wildlife viewing program at Long Lake NWR.

Trapping

Same as alternative A.

Research and Monitoring

Wildlife and Habitat

The complex staff will improve its understanding of upland management's (e.g., burning, grazing, haying) effects on vegetative composition and structure throughout the complex. They will also understand better how wetland management activities on Long Lake NWR affect the system's hydrology, water chemistry, and overall productivity.

Additionally, this alternative would increase the extent of land in the complex that is being monitored for upland vegetation change (i.e., permanent belt transect establishment). Ultimately, this alternative would result in an improved understanding of wildlife responses to management activities, would allow for better management decisions that target specific wildlife objectives. The result would be improved habitat

throughout the complex and a better ability for staff to maintain and improve recruitment of various wildlife populations.

With this alternative increased funding would be necessary to support research costs and additional staff.

Socioeconomics

Same as alternative B.

Cultural Resources

The actions in this alternative would improve complex staff's knowledge of the locations and types of cultural resources on complex lands. This improved knowledge would give the Service the ability to preserve and restore various cultural resources. This alternative has the potential to improve certain aspects of the Service's habitat management because areas of cultural concern would be identified. Additionally, this alternative increases the likelihood for more involved management schemes to protect cultural resources while accomplishing habitat management. A funding increase would accompany the actions in this alternative, in order to complete the inventory and cover costly excavation costs.

Refuge Operations

Staffing

The increased staffing that is requested in this alternative would provide the Service with the ability to accomplish the goals and objectives associated with other elements (e.g., wildlife and habitat management, public use, education, and interpretation, research and monitoring) of this alternative. Increased operational and maintenance funding would be necessary under this alternative.

Operations and Maintenance

The increased resources that are requested in this alternative would provide the Service with the ability to accomplish the goals and objectives associated with other elements (e.g., wildlife and habitat management, public use, education, and interpretation, research and monitoring) of this alternative. Increased funding for staffing, equipment, supplies (e.g., fuel, native grass seed) would be necessary under this alternative.

Infrastructure

The additional infrastructure that is requested in this alternative would provide staff the ability to accomplish the goals and objectives associated with

other elements (e.g., wildlife and habitat management, public use, education, and interpretation, research and monitoring) of this alternative. Increased funding for the construction of new infrastructure, including equipment, supplies, and additional staff, would be necessary.

Partnerships

Expanded partnerships would increase the Service's ability to provide quality habitat for a specific wildlife group (e.g., shorebirds), improve public-use opportunities within the complex, and promote additional compatible activities. It would also result in improved relationships with a greater number of private landowners, government agencies, and nongovernmental organizations. However, the increased partner load would create increased time constraints on complex staff. Because of its single-wildlife species group focus, this alternative would potentially "split" partners, possibly alienating those who have other ideas or motives that do not parallel the goals and objectives of this alternative.

Conversely, the approach of this alternative holds increased potential to attract partners that are interested in a single wildlife group (e.g., Delta Waterfowl, Pheasants Forever). Increased funding would be necessary in order to complete the new programs associated with the additional partnerships. Furthermore, because of this alternative's strong public use interest, there is potential to involve the public in refuge operations through the utilization of a friends' group.

ALTERNATIVE D—Target Species Group-level Modified Management (Proposed Action)

Wildlife and Habitat Management

Developed Wetlands

Where intensive wetland management (i.e., WCSs) continues or is further developed at Long Lake NWR, the Service expects continued and possibly accelerated alteration of the hydrology of these wetlands, which raises issues about system sustainability. Conversely, where WCSs are removed, the Service expects some level of reduction in hydrologic alteration. Through increased development of our water management capabilities on Long Lake the Service expects to be able to better manage against botulism outbreaks, as well as have a better ability to provide ideal habitat for multiple wildlife groups (e.g., waterfowl, shorebird, colonial waterbirds). This includes the use of drawdowns to increase wetland productivity

on portions of Long Lake and managed wetlands throughout the wetland management district. Additionally, Long Lake's flood attenuation capabilities have the potential to be enhanced through this alternative's actions. Performing the actions outlined in this alternative would not only require an long-term funding increase, but may also require the acquisition of permits related to water discharge and/or construction. The actions in this alternative would likely give complex staff tremendous flexibility with regard to dealing with periods of drought at Long Lake. Similarly, staff will have a great deal of flexibility in managing Long Lake's fishery, including associated turbidity problems. Finally, the increased ability to maintain high water levels on Long Lake would result in flexibility related to fall freeze-up date, depending on the wildlife group that is steering the Service's water management.

Wetlands without Water Control Structures

Where intensive wetland management (i.e., WCSs) continues or is further developed at Long Lake NWR, the Service expects continued and possibly accelerated alteration of the hydrology of these wetlands, which raises issues about system sustainability. Conversely, where WCSs are removed, the Service expects some level of reduction in hydrologic alteration. Through increased development water management capabilities on Long Lake, the Service expects to be able to better manage against botulism outbreaks, as well as have a better ability to provide ideal habitat for multiple wildlife groups (e.g., waterfowl, shorebird, colonial waterbirds). This includes the use of drawdowns to increase wetland productivity on portions of Long Lake and managed wetlands throughout the district. Additionally, Long Lake's flood attenuation capabilities have the potential to be enhanced through this alternative's actions. Performing the actions outlined in this alternative would not only require a long-term funding increase, but may also require the acquisition of permits related to water discharge and/or construction. The actions in this alternative would likely give complex staff tremendous flexibility with regard to dealing with periods of drought at Long Lake. Similarly, staff would have a great deal of flexibility in managing Long Lake's fishery, including associated turbidity problems. Finally, the increased ability to maintain high water levels on Long Lake would result in flexibility related to fall freeze-up date, depending on the wildlife group that is steering the Service's water management.

Through these actions, there is potential to increase wetland productivity (i.e., invertebrate and plant diversity) through various management actions (i.e., drawdowns, dredging). Because of the increased wetland productivity and increased management flexibility that is possible through the implementation of these actions, it would be possible to provide ideal habitat for multiple wildlife groups (e.g., shorebirds, wading birds, waterfowl). However, on wetlands that the Service selects to be managed via WCSs, there is potential for altered hydrology, which may lead to a reduction in system sustainability, in the form of increased sedimentation, conductivity, and dissolved solids accrual. Conversely, on those wetlands selected for dredging, the Service may see a reversed trend of degradation, and improved wetland function and sustainability. Increased funding would be necessary for dredging activities, construction of WCSs and associated infrastructure, as well as annual operation and periodic maintenance costs.

Native Upland Habitats (including woody species)

Through these actions there is potential to increase acreage of native grasses and forbs, which would result in a corresponding decrease in acreage of nonnative grasses and forbs. This alternative would also limit the coverage of invasive native low shrubs (i.e., western snowberry, silverberry). Once some degree of success is achieved regarding the above impacts, it is likely that, through continued management, the degree of future invasion would be minimized to a certain degree. Accomplishment of the above actions with a corresponding positive vegetative response would result in an improved breeding habitat condition for the wildlife groups represented by our selected indicator species. This relates ultimately to increased nest success and nest densities for these wildlife groups. Potential does exist for less favorable breeding habitat condition for certain species (e.g., clay-colored sparrow, exotic bird species). These actions would provide somewhat of a structural mosaic on the landscape.

Disturbed Upland Habitats

Through these actions there is potential to increase acreage of native grasses and forbs, which would result in a corresponding decrease in acreage of nonnative grasses and forbs. Once some degree of success is achieved regarding the above impacts, it is likely that, through continued management, the degree of future invasion would be minimized to a certain extent. Additionally, habitat fragmentation

and noxious weed acreage would both be reduced. Accomplishment of the above actions with a corresponding positive vegetative response would result in an improved breeding habitat condition for wildlife groups represented by our selected indicator species. Ultimately, this relates to increased nest success and nest densities for the various bird groups. These actions would provide somewhat of a structural mosaic on the landscape and ultimately allow for more efficient management.

Nonnative Trees and Shrubs

Habitat changes incurred through the implementation of the actions outlined in this alternative could go in two completely different directions depending on the target wildlife group (e.g., waterfowl).

If nonnative trees and shrubs are removed the amount of contiguous grassland habitat would be increased, and the reduction of nonnative microclimates would lead to less overall invasion of nonnative flora. Breeding habitat would be improved for grassland-dependant bird species, including improved recruitment and overall abundance. Habitat conditions for arboreal bird species (e.g., yellow warbler, black-billed cuckoo, willow flycatcher) would be degraded, as well as winter habitat for resident bird species (e.g., ring-necked pheasant, sharp-tailed grouse). Elimination of nonnative tree and shrub plantings would also reduce the edge habitat favored by parasitic brown-headed cowbirds. Additionally, this management would promote more balanced predator/prey relationships through reduced predation rates (due to less fragmented habitats) and less favorable year-round habitat for certain problematic nest predators (e.g., skunk, raccoon).

With regard to public use, these management activities could cause reduced hunting opportunities for deer and pheasants due to the loss of tree/shrub habitat. Therefore, any activities that involve the removal of trees (native or nonnative) are often controversial. Additionally, increased funding would be necessary to conduct these intensive management activities.

Conversely, if the habitat needs of the focus wildlife group warrants that existing trees/shrubs are left intact and possible additions of more trees/shrubs would be beneficial, then an entirely different sweet of habitat, wildlife, and public use impacts would prevail, as compared to those listed above. Through

additional shrub plantings, suitable habitat areas would be increased for breeding arboreal birds, as well as several resident wildlife species (e.g., white-tailed deer, ring-necked pheasants) during the winter. Additional plantings of nonnative trees and shrubs would reduce the acreage of native flora, as well as increase the degree of site fragmentation and invisibility adjacent to new plantings. Amount of edge habitat would be increased, promoting the occurrence of parasitic brown-headed cowbirds. Additionally, the number and overall acreage of microclimates suitable for problem nest predators would be increased, further exacerbating the problem of high nest predation rates. Breeding habitat conditions would be degraded for several bird groups (e.g., grassland passerines, upland nesting shorebirds and waterfowl). With regard to public use, these management activities provide increased additional hunting areas for deer and pheasants due to the increase of tree/shrub habitat. Conversely, the birding community would likely see a loss in bird species diversity and diminished birdwatching experience. Additionally, increased funding would be necessary to conduct tree and shrub planting.

Predator Management

The actions in this alternative would promote improved breeding habitat conditions for a suite of indicator species that represent multiple groups of ground/overwater nesting birds, including improved recruitment and increased abundance. Trapping would result in a decreased abundance of nest predators (e.g., skunks, red fox, raccoon), but may also result in artificially high populations of small mammals (e.g., shrew, vole) due to the removal of mid-sized predators. Removal of trees would result in less favorable habitat conditions for certain wildlife species (i.e., breeding arboreal birds, wintering deer and resident bird species). Landscape fragmentation would be reduced through the replanting of grass cover in areas where trees were previously removed, as well as acquisition of additional lands. Additionally, the “large-block” trapping component of this alternative would include partner (e.g., Delta Waterfowl Foundation) and private landowner involvement and would hold the potential for improved Service/private landowner relations throughout portions of complex. Increased funding would be necessary to conduct “large-block” intensive trapping and habitat restoration activities.

Wildlife Disease

Same as alternative C.

Priority Population Issues

Same as alternative B.

Public Use, Education and Interpretation

Hunting

There is potential to increase recreational opportunities through new hunting areas and seasons. There is also potential, after critical evaluation, to adjust certain hunting season dates and open/closed areas on refuges. This would be done to alleviate unacceptable human disturbance levels to migratory waterfowl using refuges and/or redistribute hunters in high hunter-use areas. Additionally, local breeding-bird recruitment rates could potentially be improved depending on harvest levels during predator hunting seasons. However, increased law enforcement would need to accompany any increase in hunting opportunity. So, increased funds would be needed for increased law enforcement officer support, as well as improved signage and interpretive materials.

Fishing

Implementing this alternative would result in increased disturbance to waterbirds and other wetland-dependant wildlife due a potential increase in boat traffic. The increase in fishing activity throughout complex would also result in potential habitat degradation (e.g., littering, injection of motor fuels into water) and a need for increased law enforcement. The fishery resource inventory would provide us with an improved understanding of current fisheries on Service-owned lands within complex, as well as our ability to sustain them. This alternative would result in increased opportunity to participate in one of the six priority public use activities. A substantial increase in funding would be necessary for completion of the fishery inventory, construction of boat ramps and access routes, docks, interpretive signage and materials, and an increased law enforcement presence.

Environmental Education and Interpretation

Same as alternative C.

Wildlife Observation and Photography

Same as alternative C.

Trapping

Same as alternative A.

Research and Monitoring

Wildlife and Habitat

Same as alternative B.

Socioeconomics:

Same as alternatives B and C.

Cultural Resources

Same as alternative B.

Refuge Operations

Staffing

The increased staffing that is requested in this alternative would give complex staff the ability to accomplish the goals and objectives associated with other elements (e.g., wildlife and habitat management, public use, education, and interpretation, research and monitoring) of this alternative. Increased operational and maintenance funding would be necessary under this alternative.

Operations and Maintenance

The increased resources that are requested in this alternative would give complex staff the ability to accomplish the goals and objectives associated with other elements (e.g., wildlife and habitat management, public use, education, and interpretation, research and monitoring) of this alternative. Increased funding for staffing, equipment, supplies (e.g., fuel, native grass seed) would be necessary under this alternative.

Infrastructure

Same as alternative C

Partnerships

The expanded partnerships would increase the Service's ability to provide quality habitats for multiple wildlife groups and improve public-use opportunities. It would also result in improved relationships with a greater number of private landowners, government agencies, and nongovernmental organizations. Because of its multiple-wildlife group approach, this alternative holds potential to group partners with a wide variety of interests, leading to increased funds and an increased likelihood that the goals and objectives of this alternative are achieved.

CUMULATIVE IMPACTS

Cumulative impacts result from incremental effects of the proposed action when these are added to the actions of the past, present and future. These

cumulative impacts can be the result of individually minor impacts, which can become significant when added over time.

The implementation of the proposed action (Alternative 4) would reduce the likelihood for cumulative impacts because of the incremental approach in which habitat and wildlife management and other programs would be carried out.

The new approach of the proposed action would emphasize a more ecologically-oriented, habitat-based management. This approach would alleviate some of the possible impacts that might have been caused by target-species management.

NEPA requires mitigation measures when the environmental analysis process detects possible significant impacts to habitat, wildlife, or the human environment.

All the activities proposed under alternative D are not expected, nor intended, to produce significant levels of environmental impacts that would require mitigation measures. Nevertheless, the CCP contains the following measures to preclude significant environmental impacts from occurring:

- Federally listed species will be protected from intentional or unintended impacts by having activities banned where these species occur.
- Hunting safety regulations will be closely coordinated with, and enforced by, personnel from the complex and NDGF personnel.
- All proposed activities will be regulated to lessen potential impacts to wildlife and plant species, especially during the sensitive reproductive cycles.
- Protocols will be established to help in determining goal achievement levels, possible unforeseen resource impacts, and adaptive management actions to ensure wildlife and habitat resources, as well as the human environment, are preserved.

The CCP can be revised and amended 5 years after implementation, using adaptive management techniques, to correct unforeseen impacts.

Table 6. Summary of impacts by alternatives on wildlife and habitat management

| | Alternative A <i>(Current Management no action)</i> | Alternative B <i>(Natural Processes Management)</i> | Alternative C <i>(Single Wildlife Group level Intensive Management)</i> | Alternative D <i>(Target Species Group level Modified Management proposed action)</i> |
|---|---|--|---|--|
| Wetlands With Water Control Structures (WCS) | | | | |
| Hydrology Impacts | The hydrology of Long Lake has been altered due to water impoundment by WCSs, resulting in increases in sedimentation, conductivity, and salinification, as well as in accrual of dissolved solids in the waters of the lake. This will continue to affect the long-term sustainability of the wetland system, yielding a gradual reduction in resource support capabilities. | Reduction in the degree that Long Lake’s hydrology is altered. Driving force to address potential system sustain ability issues with assumption that natural hydrology over long term will provide appropriate habitats in natural condition. | Further alteration of hydrology combined with potential to address current hydrological issues. Driving force to target habitat needs of specific species or narrow group of birds within a classification (i.e. waterfowl, shorebirds, or marsh birds). | Further alteration of hydrology combined with potential to address current hydrological issues. Driving force to target habitat needs of a guild of species representing a broad spectrum native to the area (i.e. pintail, sharp-tailed sparrow, Wilson’s phalarope, sharp-tailed grouse, and ferruginous hawk). |
| Botulism Impacts | General ability to manage most of the time. | Potential decreased ability to manage. | Potential increased ability to manage. | Increased ability to manage. |
| Wildlife Output | Outputs undermined by management to address botulism driven water management practices. | Outputs undermined by management to address potential system sustain ability issues. | Increased capability to provide ideal habitats for specific bird specie(s) or birds within a narrow group (i.e. waterfowl, etc.). | Increased capability to provide habitats which provide the needs of multiple groups or guild(s). |
| Funding Impacts | Neither increased or Decreased need. | Initial increased funding need, thereafter, potentially less funding needed to manage. | Increased funding need (cost of construction, annual recurring management costs). | Increased funding need (cost of construction, annual recurring management costs). |
| Flood Attenuatio | Ability to buffer flooding during moderate runoff. | Loss of flood attenuation capability. | Flexibility to manage portions for flood attenuation depending upon the prescribed management needs of targeted specie(s). | Flexibility to manage portions for flood attenuation depending upon the prescribed management needs of guild(s) targeted. |
| Water Permits / Rights | Perfected water rights for water stored and used. | Potential to lose water rights. May require discharge permits/construction permits. Potential humps below in drainage which would limit release of water. | May require discharge permits/construction permits depending upon the development prescribed. | May require discharge permits/construction permits depending upon the development prescribed. |

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|--|--|---|--|--|
| Timing of Freeze Up for | Seasonal timing in tune with migration needs of trust species 80-90% of years. | Reduced water levels would result in dry or earlier freeze up, resulting in reduction in Refuge benefit for migration habitat | Flexibility retained to manage for deeper water with later freeze up and/or shallow water for earlier freeze up depending on the target specie(s) driving water management. | Flexibility retained to manage for deeper water with later freeze up and/or shallow water for earlier freeze up depending on the selected guild(s) driving water management. |
| Fish | There is a possibility to sustain a sport fishery at Long Lake during the moderate to high water levels portions of the hydrological cycles. This possibility is diminished by carp-induced water turbidity problems at Long Lake. | Would essentially eliminate fishery and rough fish related turbidity problems. | Flexibility to retain or manage against fish depending on the unit and target specie(s) managed for; address turbidity problems. | Flexibility to retain or manage against fish depending on the unit and target guild(s) managed for; address turbidity problems. |
| Drought Attenuation | Some ability to capture and store water to attenuate drought conditions - delays natural cycling while maintaining wetlands during drought. | Compromised - no drought attenuation capability. | Flexibility to manage for drought attenuation depending upon the target specie(s) driving water management. | Flexibility to manage for drought attenuation depending upon the target guild(s) driving water management. |
| Wetlands Without WCS | | | | |
| Productivity Impacts | Retains the current productivity, characterized by a gradual long-term reduction in productivity due to siltation and reduction of water quality. | Potential to improve the productivity (e.g. invertebrates and plant diversity of palustrine wetlands). | Improved wetland productivity through the use of draw downs on portions of wetlands in the WMD. | improved wetland productivity through the use of draw downs on portions of wetlands in the WMD. |
| Function/Hydrology/Sustainability Impacts | Currently wetlands aging at a natural rate, experiencing gradual siltation, eutrophication and water quality deterioration. | Improved overall wetland function (e.g. groundwater recharge, flood attenuation, nutrient cycling). Potential to reverse degradation trend and restore wetland to earlier stage/age condition and lengthen the sustainability of the natural wetlands. | Altered hydrology and possible negative associated effects (e.g. increased sedimentation, conductivity, dissolved solids accrual) of natural wetlands in the WMD, including possible reduced overall sustainability of these wetlands (potentially address the sustainability issue with periodic dredging). | Altered hydrology and possible negative associated effects (e.g. increased sedimentation, conductivity, dissolved solids accrual) of natural wetlands in the WMD, including possible reduced overall sustainability of these wetlands (potentially address the sustainability issue with periodic dredging). |
| Wildlife Impacts | Maintains current support capability with a gradual decline over time due to aging and deterioration of the wetland condition. | Potential to improve the support capability for a wider diversity of wetland-dependent wildlife. | Potential to provide ideal habitats for specific specie(s) or narrow group of birds within a classification. | Potential to provide ideal habitats for multiple bird groups across a spectrum native to the area (i.e. guilds). |

Table 6. Summary of impacts by alternatives on wildlife and habitat management

| | Alternative A <i>(Current Management no action)</i> | Alternative B <i>(Natural Processes Management)</i> | Alternative C <i>(Single Wildlife Group level Intensive Management)</i> | Alternative D <i>(Target Species Group level Modified Management proposed action)</i> |
|---|--|---|---|---|
| Funding Impacts | Generally requires similar funding to present levels adjusted for economics annually. | Requires increased funding (dredging). | Increased funding needs (e.g. cost of initial construction, annual operation, periodic maintenance costs). | Increased funding needs (e.g. cost of initial construction, annual operation, periodic maintenance costs). |
| Native Upland Habitats (including woody species) | | | | |
| Management direction | Current management includes grazing, prescribed burning, spraying, clipping, re-seeding natives, and biological agents to manage native (unbroken) grasslands and tamegrass fields, and restoring and managing native grass seedings in optimum condition for nesting waterfowl and other migratory birds. Balance of native uplands and tame uplands. | Management would be driven by natural processes theme where management of native (unbroken) grasslands would target invigorating native plants (composition and diversity), management of all nonnative uplands would target native plant re-establishment and/or restoration. Future management would target maintaining native and restored habitats in as “natural” or native condition as possible. | Management would be driven by identifying the specific habitat requirements of a specific specie(s) or narrow group of birds within a specific classification (i.e. waterfowl, or shorebirds, or marshbirds) and targeting blocks of land to restore and manage for the specific habitat necessary to address those requirements. | Management would be driven by identifying the broad habitat requirements of a guild of species representing a broad spectrum native to the area (e.g. Pintail, sharp-tailed sparrow, Wilson’s phalarope, sharp-tailed grouse, and ferruginous hawk) and targeting restoration and management of all lands to provide habitat necessary to address the requirements representing indicator species across the guild. |
| Invasives Impacts | Invasives are treated with a variety of management practices. | Targets decrease in the acreage of nonnative, invasive low shrubs. Targets decrease of invasives and invading exotic grasses and forbs, potential for removing source of re-invasion and associated problems. Minimize degree of future degradation of native prairie sites. | Targets decrease of invasives and invading exotic grasses and forbs, potential for removing source of re-invasion and associated problems. Minimize degree of future degradation of native prairie sites. | Targets decrease in the acreage of nonnative, invasive low shrubs. Targets decrease of invasives and invading exotic grasses and forbs, potential for removing source of re-invasion and associated problems. Minimize degree of future degradation of native prairie sites. |
| Habitat Impacts | Habitat management targets native plant restoration through various management practices. | Increase in the acreage of native grasses and forbs. Decrease in the acreage of nonnative grasses and forbs. | Potential to target any productive habitat including nonnative low shrubs if they serve a targeted specie(s) group. | Increased acreage of native grasses and forbs. Decreased acreage of nonnative grasses and forbs and invasive nonnative low shrubs. |

Table 6. Summary of impacts by alternatives on wildlife and habitat management

| | Alternative A <i>(Current Management no action)</i> | Alternative B <i>(Natural Processes Management)</i> | Alternative C <i>(Single Wildlife Group level Intensive Management)</i> | Alternative D <i>(Target Species Group level Modified Management proposed action)</i> |
|----------------------------------|---|--|---|--|
| Wildlife Impacts | Habitat remains in current condition. | Improved breeding habitat condition for most grassland-dependent breeding bird species found in south-central North Dakota. Potential for increased nest success and nest densities of those species. Potential for less favorable breeding habitat condition for a few specific species (i.e. gadwall, clay-colored sparrow, and exotic species). | Improved breeding habitat conditions for a specific specie(s) or wildlife group (e.g. grassland passerines) including improved recruitment and increased abundance. Potential for less favorable breeding habitat condition for other “nonselected” wildlife groups (e.g. waterfowl, shorebirds, native gallinaceous birds). | Improved breeding habitat conditions for a guild of multiple wildlife species representing a broad spectrum native to the area (e.g. Pintail, sharp-tailed sparrow, Wilson’s phalarope, sharp-tailed grouse, and ferruginous hawk) including improved recruitment and increased abundance. Less favorable breeding habitat condition for a few specific species (e.g. clay-colored sparrow, gadwall). |
| Funding Impacts | Generally requires similar funding to present levels adjusted for economics annually. | Increased funding need (costs of additional management needs for restoration and maintenance of habitats). | Increased funding need (costs of additional management needs for restoration and maintenance of habitats). | Increased funding need (costs of additional management needs for restoration and maintenance of habitats). |
| Management Implications / | Continue to manage with current tracking methods. | Less difficult to meet objectives because this alternative lacks a structural criterion for individual wildlife species or groups—it does not target a wildlife output. | More limited structural composition; restricted to what is needed for one wildlife group. Better tracking of progress toward wildlife outputs. | provides more of a structural mosaic and broad habitat spatially, structurally, and temporally addressing overall needs of wildlife characteristic to the area. Better tracking of progress towards wildlife outputs |
| Disturbed Upland Habitats | | | | |
| Management direction | Current management targets converting disturbed uplands to native grass (6-8 species of grasses native to the area with varieties suited to the latitude). Approximately 250-300 acres per year are targeted for restoration. Eventual restoration of forbs into these fields is planned. | Management would focus on conversion of disturbed uplands to a diverse native grass forb mixture representative of the historical vegetation composition on a given site. | Management of disturbed uplands would focus on the habitat requirements of a specific specie(s) or narrow group of birds within a specific classification (i.e. waterfowl, shorebirds, passerines). Uplands could potentially remain cropland, tame-grass, or be restored to native grass. | Management of disturbed uplands would focus on the habitat requirements of a guild of species representing a broad spectrum native to the area (i.e. pintail, sharp-tailed sparrow, Wilson’s phalarope, sharp-tailed grouse, ferruginous hawk). Uplands would focus on ongoing efforts to restore native grass/forbs with a diversity of height, density and structure. |

Table 6. Summary of impacts by alternatives on wildlife and habitat management

| | Alternative A <i>(Current Management no action)</i> | Alternative B <i>(Natural Processes Management)</i> | Alternative C <i>(Single Wildlife Group level Intensive Management)</i> | Alternative D <i>(Target Species Group level Modified Management proposed action)</i> |
|------------------------------------|---|--|---|---|
| Habitat Composition Impacts | <p>Gradual increase in acreage of native grass/forb seedings.</p> <p>Gradual reduction in cropland and tame-grass.</p> <p>Gradual reduction in fragmentation.</p> | <p>Increased acreage of native grass/forb seedings.</p> <p>Reduced/elimination of cropland, DNC, tame-grass fields.</p> <p>Less fragmentation Reduced invisibility, less noxious weeds.</p> | <p>Potential for increased native grass and forbs depending on what wildlife group we are managing for.</p> <p>Potential for increased acreage of cropland, trees and shrubs, or nonnative grasses depending on what wildlife group we are managing for ncreased invisibility, more noxious weeds.</p> <p>Potential for increased fragmentation. Not maximizing land to fullest wildlife potential.</p> | <p>Increased acreage of native grass/forb seedings.</p> <p>Reduced/elimination of cropland, DNC, tame-grass fields.</p> <p>Less fragmentation.</p> <p>Reduced invisibility, less noxious weeds.</p> <p>Potential to manage land more efficiently.</p> |
| Wildlife Impacts | <p>Gradual improvement in breeding habitat for grassland-dependent birds.</p> <p>Less favorable habitat conditions for a few specific species.</p> | <p>Improved breeding habitat conditions for most grassland dependent breeding bird species (i.e. increased nest success rates, increased nest density).</p> <p>Less favorable breeding habitat conditions for a few specific species (i.e. clay-colored sparrow, gadwall).</p> <p>Reduced degree of invisibility, potential effects on territories and ranges of specific bird species.</p> <p>Provides habitat for a declining species group (native grassland dependent birds).</p> <p>Less pheasants, less deer</p> | <p>Improved breeding habitat condition for a specific wildlife group (i.e. grassland passerines) including improved recruitment and increased abundance.</p> <p>Potential for less favorable breeding habitat condition for other nonselected wildlife groups (i.e. waterfowl, shorebirds, native gallinaceous birds).</p> <p>If we elect to leave nonnative cover or cropland, increased degree of invisibility, potential effects on territories and ranges of specific bird species, increase noxious weeds.</p> | <p>Improved breeding habitat conditions for a guild of species representing a broad spectrum native to the area (i.e. pintail, sharp-tailed sparrow, Wilson’s phalarope, sharp-tailed grouse, ferruginous hawk) including increased nest success rates, increased nest density</p> <p>Less favorable breeding habitat conditions for a few specific species (i.e. clay-colored sparrow, gadwall)</p> <p>Reduced degree of invisibility, potential effects on territories and ranges of specific bird species.</p> |
| Funding Impacts | <p>Generally requires similar funding to present levels adjusted for economics annually.</p> | <p>Increased funding need (cost of additional management activities).</p> <p>Cost:benefit ratio—is it even possible to accomplish due to changes in soil structure, range site alteration?</p> | <p>Increased funding need (cost of additional management activities).</p> | <p>Increased funding need (cost of additional management activities).</p> |

| Nonnative Trees and Shrubs | | | | |
|----------------------------|--|---|--|--|
| Management direction | Current management is conducted on an “as needed” basis - management includes removal of volunteer trees and shrubs from grasslands, additionally, sentinel trees that serve as raptor perches are removed from grassland nesting habitat. | This alternative would remove all nonnative trees and shrubs on all lands in the complex. | This alternative would manage nonnative trees and shrubs on a tract by tract basis allowing management actions that provide benefit for a specific wildlife species or narrow group of birds within a classification (waterfowl, shorebirds, upland birds, game mammals, etc) This would allow maintaining existing, augmenting and/or removal. | This alternative would manage nonnative trees and shrubs in a manner which provides the greatest overall benefit to the guild or select group of indicator species (i.e. Pintail, sharp-tailed sparrow, Wilson’s phalarope, sharp-tailed grouse, ferruginous hawk). |
| Habitat Impacts | Management would continue as described above. | Decreased acreage of nonnative flora. Reduced areas for nonnatural microclimate relates to less invasive and noxious invasion. | <u>if removed:</u> Reduced winter habitat for some resident species (exotic gallinaceous birds, deer). Increased grassland habitat. Less fragmentation and micro-climate for invading exotics and noxious plants <u>if planting and no removal:</u> Decreased native flora and increased potential for nonnative species invasion into grassland areas. More fragmentation and micro-climate for invading exotics and noxious plants | <u>if removed:</u> Reduced winter habitat for some resident species (exotic gallinaceous birds, deer). Increased grassland habitat. Decreased nonnative flora. Less fragmentation and micro-climate for invading exotics and noxious plants. <u>if planting and no removal:</u> Decreased native flora and increased potential for nonnative species invasion into grassland areas. More fragmentation and micro-climate for invading exotics and noxious plants. |

| | | | | |
|--------------------|---|---|---|---|
| Wildlife Impacts | Continued at present levels | <p>Improved breeding habitat conditions for grassland-dependent bird species; including improved recruitment and increased abundance.</p> <p>Less favorable breeding habitat conditions for arboreal bird species (i.e. yellow warbler, black-billed cuckoo, willow flycatcher).</p> <p>Less favorable winter habitat for some resident species.</p> <p>More balanced predator/prey relationships.</p> <p>Reduced population of parasitic birds (i.e. cowbirds).</p> <p>Restoration for native assemblages.</p> | <p><u>if removed:</u> Improved breeding habitat condition for a specific wildlife species or narrow group of birds within a classification.</p> <p>Less favorable breeding habitat condition for other wildlife groups (i.e. arboreal birds).</p> <p><u>if planting and no removal:</u> Increased winter habitat for some resident species (exotic gallinaceous birds, deer)</p> <p>Additional breeding habitat condition for specific wildlife groups (i.e. arboreal birds).</p> <p>Less favorable breeding habitat conditions for certain wildlife groups (e.g. grassland-dependent passerines, shorebirds, waterfowl_ including increased predation rates and lower abundance.</p> | <p><u>if removed:</u> Improved breeding habitat condition for a variety of grassland-dependent birds (i.e. Baird's sparrow, pintail, marbled godwit) including improved recruitment and increased abundance.</p> <p>Less favorable breeding habitat condition for arboreal birds species (i.e. yellow warbler, black-billed cuckoo, willow flycatcher).</p> <p><u>if planting and no removal:</u> Increased winter habitat for some resident species (exotic gallinaceous birds, deer).</p> <p>Additional breeding habitat condition for a variety of arboreal bird species (i.e. yellow warbler, black-billed cuckoo, willow flycatcher).</p> <p>Less favorable breeding habitat conditions for grassland-dependent birds including increased predation rates and lower abundance.</p> |
| Public Use Impacts | Continues opportunities at or near existing levels. | <p>Reduced hunting opportunities (deer, pheasant due to loss of tree/shrub habitat).</p> <p>Controversial due to cutting down of trees.</p> | <p>More/less hunting opportunity for deer pheasants depending on if removed or planting.</p> <p>Potentially more/less abundance of native birds for observation less diversity because of exclusion/reduction of exotics and non traditional species.</p> | <p>More/less hunting opportunity for deer pheasants depending on if removed or planting.</p> <p>Potentially more/less abundance of native birds for observation less diversity because of exclusion/reduction of exotics and non traditional species.</p> |
| Funding Impacts | Generally requires similar funding to present levels adjusted for economics annually. | Increased funding needs to accomplish management activities. | Increased funding needs to accomplish management activities. | Increased funding needs to accomplish management activities. |

