

# Chapter 3. Alternatives

## Introduction

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

This chapter describes four management alternatives for the complex: alternative A, Current Management (No Action); alternative B, Natural Processes Management; alternative C, Single Wildlife Group-level Intensive Management, and; alternative D, Target Species Group-level Modified Management (Proposed Action).

## Alternatives Development

In the spring of 2004, the Service held five public open houses in towns located throughout the complex's boundaries to identify the issues and concerns that were associated with the management of the complex. The public involvement process is summarized in greater detail in chapter 2. Based on public input, as well as guidelines from NEPA, the Improvement Act, and Service Planning Policy, the planning team selected the substantive issues that will be addressed in the alternatives. Substantive issues identified for the complex are:

- water management
- Long Lake hydrology and water quality
- upland habitat management
- predator management
- disease management
- public use
- research
- cultural resources
- socioeconomics
- Lake Isabel Recreation Area
- habitat protection and acquisition
- threatened and endangered species
- wildlife population monitoring
- budget and staffing
- partnerships

The planning team discussed alternatives for management that will address the substantive complex issues and meet Service goals. Each alternative described in the following sections addresses the substantive issues somewhat differently.

## Elements Common to all Alternatives

A number of elements are common to all four alternatives listed. Water management concerns related to the possible negative impacts on Long Lake's hydrology and water quality are considered in all alternatives. The need to maintain suitable habitat for wetland-dependent birds is also a consistent theme throughout.

Management of upland habitats includes the potential use of an array of practices (i.e., fire, grazing, chemicals, biological control) in all alternatives. Across all alternatives, disturbed upland management (i.e., lands that have been, or are currently being, cropped, farmed, broken, or seeded to a native or tame-grass mixture) focuses on improved habitat quality for trust resources, whether that habitat is native or nonnative.

Reduced predation rates on ground- and overwater-nesting birds, achieved through a variety of means, is a common priority of every alternative.

Maintaining support for hunting, fishing, wildlife observation and photography, and environmental education and interpretation are common to all the alternatives.

The research and monitoring efforts in all alternatives focus on improving the Service's knowledge of how best to control invasive nonnative flora, increasing the intensity and extent of upland vegetation monitoring, and monitoring the long-term water quality and hydrologic parameters of Long Lake.

All four alternatives also promote, at a minimum, the opportunistic identification, documentation, and protection of the complex's cultural resources. Strong and diverse partnerships are also promoted throughout, in order to help meet objectives and achieve complex goals.

## Description of Alternatives

The theme and general management direction for each alternative is described below.

### *Alternative A—Current Management (No Action)*

#### *Summary*

Under alternative A, management activities being conducted by the Service throughout the complex would not change. The Service would not develop any new management, restoration, or education programs for the complex. Staff would not expand or change current habitat and wildlife management practices conducted for the benefit of migratory birds and other wildlife. Staff would conduct monitoring, inventory, and research activities at their current level (i.e., limited, issue-driven research and limited avian and vegetative monitoring and inventory). Funding and staff levels would not change and programs would follow the same direction, emphasis, and intensity as they do at present. Staff would continue to manage Florence Lake NWR and Slade NWR as unstaffed satellite refuges.

#### *Water Management*

This management targets one primary objective: reducing the potential for, or lessening the severity of, botulism outbreaks. Botulism is the primary resource concern on Long Lake. Water-level management would continue to be accomplished through the use of existing water control structures. Annual water-level targets for three Long Lake NWR pools are either full pool or empty (dry) (see figure 8, water control structures and water management facilities, alternative A).

While other resource benefits (e.g., deep marsh habitat) would potentially occur as a result of this management, they are not the primary target of water management planning and annual operations. Smaller Long Lake NWR impoundments, which are independent of Long Lake proper, would be managed specifically to target habitats for one or more of the following purposes: waterfowl production, shorebird migration, waterfowl and sandhill crane migration, and production of wetland plant and animal foods. Pumping can provide a source of water to smaller impoundments, providing wetland habitat when spring runoff is limited. As is current practice, impoundments in the wetland management district would most often be managed as semi-permanent wetlands; however, periodically they would be managed in a drawdown

phase to simulate the natural cycles of seasonal wetlands and consequently maintain high levels of productivity.

Service-owned wetlands throughout the wetland management districts are primarily natural basins that lack water-control capabilities. These wetlands would continue to be subject to little active management. Changes that incur would be largely a result of changing climatic conditions (i.e., periods of drought and deluge) that result in a corresponding change in their abiotic and biotic communities. Management of these wetlands typically consists of: 1) maintaining perennial grass cover around their perimeters to minimize negative anthropogenic impacts (i.e., sedimentation); 2) allowing prescribed fire and permitting 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 at wetland edge areas.

#### *Long Lake NWR Hydrology and Water Quality*

Under this alternative the staff would continue its efforts to try to manage water levels in Long Lake to avoid or minimize outbreaks of botulism. The refuge would maintain existing water management structures and associated facilities in good repair.

#### *Upland Habitat Management*

Management would continue to include grazing, prescribed burning, spraying, and clipping, as well as use of biological control agents to combat invasive nonnative and native (e.g., western snowberry, silverberry) plants and shrubs. Management would continue to be geared toward decreasing invasive exotic plants (i.e., smooth brome, Kentucky bluegrass, crested wheatgrass, leafy spurge, Canada thistle, absinth wormwood) while promoting the growth of native plant species. Some sites that do not respond to the above management treatments would be inter-seeded with a native-grass mix as per current practice. Altogether, the management activities described above will continue to occur on approximately 2,500 acres per year within the complex.

Current management of disturbed uplands would continue to focus on converting unsuitable migratory bird nesting habitat (i.e., cropland, degraded dense nesting cover [DNC], monotypic cool-season tame grass stands) to a native-grass mixture. Species included in the grass mix are based on historic vegetation and soil structure and

would continue to be seeded using a drill. The complex staff would follow the current protocol of seeding 250 to 300 acres per year. To achieve success in seeding, several management techniques would be utilized, including: cropping, burning, clipping, and/or chemically fallowing sites. Seeded native-grass stands and existing disturbed uplands are periodically managed to rejuvenate grass, reduce litter accumulations, and control undesirable noxious weeds through haying, grazing, burning, and chemical or biological treatments.

Current management of nonnative trees and shrubs (i.e., exotic species, planted native species) is conducted on an “as needed” basis. Management includes the removal of volunteer trees and shrubs from grassland areas to retain the native, early-successional character of mixed-grass prairie and thereby benefit grassland-dependent migratory birds (e.g., marbled godwit, northern pintail).

#### *Predator management*

Predator management throughout the complex (including on the WPAs) currently includes removing select “sentinel” trees, which serve as perches for various raptors (e.g., great horned owl, red-tailed hawk), from both migratory bird nesting habitats and stop-over and staging concentration areas, as well as issuing a limited number of trapping permits for mammalian predators (e.g., red fox, raccoon) during periods when their fur is of value and the Service can attract interested trappers to remove them. These periods are generally during the fall and winter, when removal of predators is less effective in managing avian recruitment than during the nesting season. Trapping is regulated by special use permits on all refuges in the complex, and permit holders are considered “management agents,” selected to address specific management needs. Trappers are selected based on a combination of their interest, experience, and skill. Special emphasis is placed on mammal populations that are known to cause one of the following: 1) damage to refuge infrastructure; 2) localized depredation problems for adjacent landowners, or; 3) specific resource issues (i.e., spreading disease, elevating predation rates on ground-nesting birds to unacceptable levels). Occasionally, predator removal is needed at special sites (i.e., nesting islands, peninsulas, waterbird colonies). Sometimes, when complaints from adjacent landowners document depredation problems, a government control agent is allowed to remove coyotes from Long Lake NWR. On WPAs, recreational trapping and hunting of mammalian

predators occurs throughout state-regulated seasons. These programs are authorized by law and are not management-directed predator control measures.

#### *Wildlife Disease*

The complex staff would continue to take a direct approach when faced with wildlife disease outbreaks. The most extensive and perennial disease issue in the complex is botulism. Management of botulism outbreaks involves the removal of all bird carcasses from affected wetlands as soon as an outbreak is discovered, followed by continued monitoring of the outbreak’s status and continued carcass removal, as needed. West Nile Virus is another disease that has recently impacted some waterbird colonies in Long Lake’s WMD. West Nile Virus outbreaks would be handled by complex staff in a manner similar to botulism outbreaks. A sample of wildlife carcasses from all disease outbreaks, as well as select wildlife carcasses with unknown mortalities, would be forwarded annually to the National Wildlife Health Center, in Madison, Wisconsin, so that the cause of mortality can be confirmed and more information can be gained on present and future disease-related issues. Each summer, prior to the occurrence of botulism outbreaks, specific habitats (i.e., wetlands with a history of botulism) would be monitored, so that the complex staff is aware of disease outbreaks at, or soon after, their inception. Other recent wildlife disease monitoring includes the collection of a sample of hunter-harvested white-tailed deer heads, for submission to veterinary diagnostic centers, to be tested for chronic wasting disease (CWD). Monitoring would be conducted according to the needs of the NDGF.

#### *Priority Population Issues*

We presently document the occurrence of federally threatened and endangered species (i.e., bald eagle, piping plover, whooping crane) on Service lands within the complex through opportunistic sightings and limited systematic surveys, with respect to piping plovers.

#### *Priority Population Issues*

Maintaining the current survey protocols and level of effort to locate and monitor populations of priority species will allow the staff to protect known populations of these species. However, locating and monitoring unknown populations within the complex will likely be the result of opportunistic discoveries.

### *Public Use*

At Long Lake NWR, bank fishing would continue to be allowed only from specified areas, including two Long Lake Creek areas: one area along the north side of B Dike, and one area along the south side of A Dike (see figure 9, public use map, alternative A). Following current policy, Boats would be allowed on Long Lake Creek, as long as the speed limit and other restrictions were followed and access is gained from designated trails or established road right-of-ways. Fishing is permitted on WPAs. Known gamefish populations exist on only two WPAs and there are no plans to introduce fish to others.

The complex's hunting program would continue to include upland gamebird (i.e., ring-necked pheasant, sharp-tailed grouse, gray partridge) and deer hunting on Long Lake NWR. The upland gamebird season begins on the Monday immediately following the close of the State firearms deer season, and closes concurrent with the statewide closing date. Deer hunting is open to archery, muzzleloader, and other firearms users, with season dates paralleling the regular statewide seasons. A small portion (15 percent) of Long Lake NWR, close to complex headquarters, would remain closed to all hunting, with the exception of archery deer. Slade NWR and all WPAs are open to deer hunting (all State seasons), with season dates paralleling the regular statewide season. WPAs are open to all other types of hunting (i.e., waterfowl, small game, furbearer), consistent with State regulations. Florence Lake NWR would remain closed to all hunting. Access is limited to foot traffic on all Service lands, with the exception of identified motorized vehicle trails on specific WPAs.

Current environmental education and interpretation programs conducted by complex staff would continue. They include hosting annual youth events (e.g., Lines for Little Ones, Juniors Acquiring Knowledge Ethics and Sportsmanship [JAKES] Day), as well as opportunistic on-site and off-site environmental education programs. Displays and exhibits, including signage and brochures, would be maintained at the complex headquarters, as well as other public-use facilities throughout the complex.

The facilitation of wildlife observation and photography throughout the complex would still consist of providing sharp-tailed grouse observation blinds at Long Lake NWR, maintaining an up-to-date bird species list for Long Lake NWR, and

allowing the public the opportunity to use portable viewing and photography blinds through the issuance of special use permits.

Public trapping is currently regulated by special use permits on all refuges in the complex and targets predator management objectives. There is no recreational trapping program on the refuges administered by the complex. On WPAs, recreational trapping is an activity that has been approved by legislation.

Research and monitoring of current socioeconomic conditions throughout the complex and in the communities surrounding the complex will remain informal, leaving staff with an insufficient understanding of what motivates the public to visit Service lands, or whether the public's needs and expectations are being met. It will remain very difficult for complex staff to ascertain what values the visiting public places on wildlife and other natural resources, or to tailor environmental education and public use infrastructure to their specific needs.

The complex staff would continue to have only limited means to determine the complex's influence on the economic conditions in surrounding municipalities and in the State. The complex staff would continue to have only limited knowledge of current visitation levels, or the areas from which the various visiting public travels.

Currently, complex staff would continue to document and protect new cultural resources as they are opportunistically found. Staff would also protect existing known resources from vandalism, theft, and destruction. Sites with historical significance will be maintained and preserved according to Service guidelines.

### *Threatened and Endangered Species*

Under this alternative the staff would continue to monitor and document the presence and use of complex lands by federally listed species, such as piping plovers, whooping cranes, and bald eagles. The staff will continue to impose area closures to public use in order to protect federally listed species using the complex.

### *Habitat Protection and Acquisition*

Under this alternative, the Service would continue to pursue opportunities to protect wildlife habitats on a willing owner/seller basis. The mechanisms to conserve valuable lands for wildlife would include,

but not be limited to, pursuing easements, contracts, and fee-title purchases of both wetland and grasslands.

#### *Monitoring*

The current wildlife and habitat monitoring effort throughout the complex would continue. It includes annual surveys of various bird groups (e.g., breeding and migrant shorebirds, breeding waterfowl, grassland passerines, sharp-tailed grouse, ring-necked pheasants) on certain Service lands, periodic monitoring of waterfowl and colonial waterbird nesting effort and success on certain Service lands, involvement in various nonavian wildlife projects (e.g., CWD monitoring, small mammal inventory), inventory and monitoring projects related to the flora of complex lands (i.e., belt transect monitoring of management effects, Refuge Lands GIS habitat mapping), and various cooperative research efforts with other agencies and organizations (e.g., U.S. Geological Service [USGS], University of North Dakota). Staff will continue to use available information and sound science to make informed management decisions.

#### *Budget and Staffing*

Current staffing levels would remain the same (see table 1 for list of positions).

Operations and maintenance for the complex would continue to consist of maintaining vehicles and other equipment in good working condition, in order to achieve management goals. Maintenance staff will operate with available funding and resources.

There would be no new infrastructure (see table 1 for list of facilities).

#### *Partnerships*

Staff would work to preserve existing partnerships that strive to address resource information needs, protect and enhance habitat (both public and private), and promote public use, education, and outreach. Current partners include local private landowners, for management, grassland and wetland easement acquisition, weed initiatives, and outreach. The complex also partners with government agencies (e.g., USGS) and nongovernment organizations as well (e.g., Bismarck-Mandan Bird Club, Delta Waterfowl Foundation, Manomet Center for Conservation Sciences) for biological monitoring and research activities. The complex also involves local wildlife clubs in supporting educational events (i.e., JAKES

Day, Lines for Little Ones) and fosters partnerships with local communities for resource protection (e.g., developing memoranda of understanding with local fire departments). The complex promotes continued grant development with partners, seeking funding to accomplish mutual goals.

### ***Alternative B—Natural Processes Management***

#### *Summary*

This alternative focuses on a return to more natural wetland and upland habitats and functions (e.g., removal of WCSs throughout the complex). Intensive management strategies (e.g., reseeding disturbed upland sites with native plant seed, chemical control of noxious weed species) might be used to achieve objectives and goals, but end results focus on minimal use of artificial infrastructure and a minimal number of nonnatural areas (e.g., tamegrass fields). Additionally, public use and environmental education and interpretation goals would be achieved through the use of minimal nonnatural structures (e.g., signs, trails, kiosks, wildlife viewing structures) in order to promote a more natural (primitive) experience for the visiting public. Furthermore, changes in the complex's research and monitoring, staffing, operations, infrastructure, and partnership development would be required to accomplish this alternative's objectives and goals.

#### *Water Management*

Impounded wetlands in the wetland management district will be breached in an attempt to restore these areas to their natural condition (i.e., temporary or seasonal marsh, upland), while subsequently restoring watersheds to a more natural hydrology; supplying water that was historically captured in portions of watersheds that flooded naturally prior to impoundment construction.

This alternative would explore the option of removing nonwetland substrate (via dredging) from natural wetlands that the Service determines to be heavily impacted by sedimentation. This activity would be in addition to paralleling the wetland activities outlined in alternative A.

#### *Long Lake Hydrology and Water Quality*

This alternative would promote the return of impounded Long Lake NWR pools to a more natural hydrology by reestablishing a more historic capacity to hold, flood, and evacuate water (Long

Lake's capacity is three feet higher than it historically was, due to constructed dikes and WCSs). WCSs and dikes will be decommissioned where practical, to allow Long Lake to revert back to more natural cycles of drought and deluge.

#### *Upland Habitat Management*

The actions of alternative B would parallel those in alternative A, but would target approximately 5,000 acres per year, rather than 2,500 acres per year.

Management would focus on an ongoing process to convert disturbed uplands (i.e., cropland, DNC, monotypic cool-season tamegrass stands) to a diverse native-grass and forb-species mix, representative of the historical vegetation composition at a given site. Sites would be tested to determine current soil structure, and appropriate native species would be seeded according to the soil types. Several soil types may exist within a treatment area; therefore, several grass mixtures would likely be needed for an individual site. Native grass seeding would continue throughout the complex, until all Service-owned lands have a substantial native mixed-grass prairie vegetation component. Established native grass stands and the remainder of the disturbed uplands would be periodically managed to rejuvenate grass, reduce litter accumulations, and control undesirable noxious weeds through haying, grazing, burning, and chemical or biological treatments. This management alternative would entail the removal of all nonnative trees and shrubs on all Service-owned lands in the complex. This action would benefit grassland-dependent bird species and return the face of these lands to more of a pre-European settlement look. The Service would continually monitor volunteer woody vegetation and remove it.

#### *Predator Management*

This alternative would promote reduced fragmentation of habitats and creation of large blocks of habitat, through restoration, protection, and management. This would be done to address the indirect causes of increased predation on ground-nesting birds. This alternative would target the removal of trees, rock piles, culverts, and other predator microhabitats. It would also minimize "edge" through large-block grass restoration. The Service would remove tree rows, plantings, and shelterbelts and reseed to grass. Furthermore, additional lands would be acquired, protected, and/or managed to increase "block" size and reduce

fragmentation and its associated intensified predation affects. Trapping and removal of individual predators will target restoring a more natural balance, regarding both species composition (i.e., native versus exotic) and population levels (i.e., focus on historical levels).

#### *Wildlife Disease*

This alternative would require no Service action for disease outbreaks within the complex, under most circumstances. An active response would be initiated only if an outbreak posed a possible human health threat.

#### *Priority Population Issues*

This alternative promotes a re-directed survey effort to identify lands that harbor breeding piping plovers, as well as lands that are suitable for the Dakota skipper butterfly (candidate species). It also entails 1) specific habitat enhancement and nest protection efforts for the piping plover, 2) enhanced protection efforts for fall migrant whooping cranes, and 3) implementation of statewide management guidelines for the Dakota skipper on certain Service lands.

#### *Public Use*

No expansion of the complex's current fishing program would occur under this alternative. At Long Lake NWR, bank fishing would still be allowed in specified areas; however, boats would no longer be allowed on any portion of the refuge. Fishing would still be permitted on WPAs and known gamefish populations on WPAs would continue to be exploited, but there would be no efforts to introduce fish to new WPAs or refuges. Boats would be allowed on WPAs in support of fishing, provided access is available from designated trails or established road right-of-ways.

The complex hunting program would be structured, first and foremost, to aid in achieving wildlife population objectives. It may involve refuge-specific permit limits for the firearms deer season on certain tracts (i.e., Long Lake NWR and Slade NWR). In order to decrease nonnative game-species populations (i.e., gray partridge, ring-necked pheasant), hunting regulations for these game species would be liberalized (e.g., open areas, season lengths) in comparison to the present structure, where compatible. Additionally, furbearer hunting would be allowed on refuge lands in order to help reduce nest predator populations (e.g., red fox, raccoon) to acceptable levels. Access would continue to be limited to foot traffic on all

Service lands, with the exception of identified motorized vehicle trails on specific WPAs. The possible closure of existing motorized vehicle trails on WPAs would be explored.

In addition to paralleling the environmental education and interpretation activities outlined in alternative A, this alternative would strive for a more natural (primitive) environmental learning experience for visitors throughout the complex, but especially at Slade NWR. This alternative would focus on minimizing off-road/trail impacts and reducing signage to a minimum level.

Management of the complex's wildlife observation/photography and recreational trapping programs would parallel alternative A.

*Threatened and Endangered Species*  
Same as alternative A.

#### *Research*

In addition to paralleling the range and load of biological study that currently exists throughout the complex, biological staff would expand the scope of research for a variety of subjects. New or expanded research would ensue on the following subject areas: 1) improved success in native grass and forb seeding (i.e., establishment of a dominant native component with specific structural characteristics); 2) management technique effectiveness in reducing smooth brome and Kentucky bluegrass dominance at both native and nonnative sites, and; 3) management technique effectiveness in reducing noxious weed (e.g., leafy spurge, Canada thistle, wormwood) prevalence.

New monitoring efforts would ensue related to the long-term monitoring of temporal abiotic changes (e.g., salinity) to Long Lake and corresponding effects on Long Lake's floral and faunal (specifically, aquatic macroinvertebrates) communities. Further, the current monitoring effort for vegetative transect establishment would be expanded to gain a better understanding of vegetative community changes related to various management practices. Additionally, the Service would initiate research relating to how increased visitation (i.e., hunting, bird watching) at Long Lake NWR might affect various wildlife groups (i.e., wildlife tolerance to human disturbance).

Furthermore, under this alternative staff would develop ways to collect and monitor the public's use of the complex, as well as analyze the Service lands'

impact on the socioeconomic environment of neighboring municipalities and the State. Staff would either actively engage in, or contract out, the collection and analysis of socioeconomic (e.g., expenditures), geographical (e.g., where are visitors from and how did they get to the complex), and qualitative/quantitative data (e.g., when they come and why) that would allow for expansion or modification of public-use programs to better accommodate compatible public uses.

#### *Cultural Resources*

This alternative would mandate that the Service's cultural resource staff oversees the identification, documentation, evaluation, protection, and interpretation of cultural resources on complex lands. Projects involving a potential adverse effect to significant cultural resources would follow procedures as outlined in Section 106 of the National Historic Preservation Act. Refuge areas with a high potential for cultural resources (based on a site-sensitivity model) would be intensively inventoried. Those with moderate potential would be inventoried based on random samples. Identified cultural resources would be documented and evaluated for eligibility to the National Register of Historic Places and those determined eligible would be protected and preserved to the extent possible. When appropriate, historic structures would have structural assessments and plans for adaptive reuse. Educational outreach opportunities, including workshops, presentations, signage, or literature would be provided on a continuing basis.

A substantial program expansion would accompany this alternative, in order to address program needs that target a "natural process" management strategy. In addition to the positions listed in alternative A, five new positions would be needed to accomplish the goals and objectives of this alternative (see table 1)

*Habitat Protection and Acquisition*  
Same as Alternative A.

#### *Monitoring*

This alternative would continue current efforts delineated under alternative A, but would also promote further efforts to monitor for improved success of seeded areas to native grasses (both in composition and structure), as well as monitoring control efforts for nonnative grasses (e.g., Kentucky bluegrass, smooth brome, etc.) and other invasive plant species. Further research and monitoring would include water chemistry and quality and its

effects on flora and fauna at Long Lake. A new line of research and monitoring under this alternative would be the effects by and responses of wildlife as a result of public uses and visitation.

#### *Budget and Staffing*

The complex would increase operations and maintenance to support management of resource needs. Restoration and rehabilitation of altered habitats and ecosystems would require increased staffing, equipment, and funding. Management actions would include intensive rehabilitation of altered habitat (i.e., removal of nonnative trees, restoration of a native vegetation component, removal of WCSs, dredging of selected wetlands), and increased management to maintain restored habitats. Without increased funding for staffing, equipment, and supplies, the goals and objectives of this alternative could not be achieved.

Although some infrastructure (i.e., dikes, WCSs) would be eliminated under this alternative, there would be a need for office expansion, additional equipment storage areas, and possibly additional government housing.

#### *Partnerships*

Existing partnerships would be expanded to address resource information needs related to restoration of altered ecosystems and habitats. Continued work with local, state, and federal agencies would be promoted, as well as expanded and targeted private land partnerships to protect and enhance threatened habitats within the complex. Further, complex staff would promote the development of partnerships with local communities to better inform the public of available programs (i.e., easement, Partners for Wildlife, environmental education) or important complex events.

#### ***Alternative C— Single Wildlife Group-level Intensive Management***

##### *Summary*

Long Lake's water management capability would be further developed by exploring an outlet (which would allow full drawdown) and developing other infrastructure (e.g., diversions, channels, pumping stations, additional dikes) to allow water supplies in different pools to be distributed and evacuated more independently. Conversely, WCSs and associated infrastructure would be removed and decommissioned if the habitat needs of a particular priority wildlife group (e.g., shorebirds) warranted

it. This alternative would have the potential to provide additional management options to address habitat requirements and needs of specific groups of water-dependent birds (e.g., cranes). A similar wetland management philosophy (i.e., further development and management of impoundments or removal of WCSs, dependent on the habitat needs of specific groups of wetland birds) would apply to wetlands on Service lands throughout the complex.

#### *Water Management*

In addition to paralleling the management practices outlined in alternative B, the Service would examine natural wetland basins throughout the complex to determine which ones have the potential for some water-level control. Placement of new WCSs would be on a wetland-by-wetland basis and only considered if the benefits of water-control capability (e.g., increased wetland productivity, increased availability of preferred wetland plants) to a certain wildlife group (e.g., waterfowl) outweigh possible negative impacts to specific wetlands.

#### *Upland Habitat Management*

Management of native upland habitats would be driven by the resource needs of a specific wildlife group (i.e., grassland passerines). Vegetative-species composition and structure would be managed according to the needs of the target wildlife group, allowing for a native or nonnative (i.e., dense nesting cover) composition, depending on specific habitat requirements of the selected wildlife group.

Likewise, management of disturbed upland habitats would be driven by the resource needs of a specific wildlife group (e.g., grassland passerines). Under this alternative, management would be directed to convert unsuitable habitats into habitat types that meet the requirements of the particular wildlife group. Depending on the target wildlife group, disturbed habitats may be converted to any one of a number of cover types (i.e., cropland, tamegrass, DNC, native seeding).

Nonnative trees and shrubs would be managed on a tract-by-tract basis, allowing for management actions that provide benefit for a specific wildlife group. This alternative would allow for the planting of nonnative trees and shrubs for the benefit of a certain wildlife group (e.g., deer, warblers, exotic gallinaceous birds, raptors). Conversely, it would allow for the removal of existing nonnative trees and shrubs for the benefit of another wildlife group

(e.g., grassland-dependent passerines, upland-nesting shorebirds and waterfowl).

#### *Predator Management*

Predator management practices would target predators that hunt ground or over-water nesting birds. This alternative would promote “large block” (i.e., township-level), nesting-season trapping to remove mammalian predators from high-density waterfowl nesting areas. These areas presently host more than eighty breeding duck pairs per square mile. Predator management on these intensively managed sites would target improving populations of specific species within a specific bird group (e.g., waterfowl). It would also target the removal of raptor perches (e.g., shelterbelts, sentinel trees), to the extent practical, in, and adjacent to, nesting areas.

#### *Wildlife Disease*

Disease response activities would parallel those outlined in alternative A. Additionally, research would be initiated that would evaluate the efficacy of current Service-directed botulism cleanup activities, and ultimately determine under which situations, if any, carcass removal activities are warranted. Adaptive resource management would be employed to determine the long-term course of action regarding botulism outbreaks.

#### *Priority Population Issues*

Same as alternative B.

#### *Public Use*

Fishing program management would promote the following: 1) improved access for fishing, where compatible in the complex; 2) improved fisheries (e.g., stocking fish) in large wetlands where fish populations are sustainable and where compatible with other objectives, and; 3) improved facilities to support fishing programs. Boats would be allowed and access developed where fishing programs are compatible with other objectives.

The complex’s hunting program would be structured so that it maximizes public-use opportunities, where compatible. Portions of all refuges would be open to hunting for deer, upland game, furbearers, and waterfowl. The possibility for increased and improved access for hunters of all abilities would be explored on both refuges and WPAs. Additionally, opportunities for special hunts (i.e., youth, physically challenged) would be explored, along with the possible construction of permanent and/or semi-permanent accessible public

hunting structures (e.g., blinds, stands) on refuges and WPAs.

The current level and quality of environmental education and interpretation opportunities and facilities would be expanded to meet the needs of a wide array of target audiences of all abilities. Special emphasis would be placed on Long Lake NWR and Slade NWR, due to their geographic location and physical characteristics, respectively. A plan to rehabilitate Long Lake NWR’s historic stone buildings into a year-round environmental education and interpretive center would be implemented. At Long Lake NWR, the Service would construct an observation tower, along with an accessible observation deck overlooking unit II Marsh and unit II. The tower and deck would include interpretive panels containing information about area wildlife. This area is a waterbird concentration area and would give the public an excellent opportunity to view the various species that utilize the wetland habitats at Long Lake NWR (e.g., ducks, geese, cranes, shorebirds, colonial-nesting waterbirds). To enhance and merge these two projects, complex staff would construct a trail from the stone buildings to the observation tower.

The Service would create a pamphlet to aid in the interpretation of the sights and sounds along the trail. It would also create an auto tour route using existing roads around Long Lake NWR, with its own pamphlet to help interpret popular wildlife viewing locations.

Facilities at Slade NWR would be upgraded to meet accessibility standards. Upgrades would include accessible trails and tables. Signage at the refuge would be reduced, by installing a centralized kiosk, which would include rules and regulations, wildlife information, and an interpretive panel about the history of the refuge. The expansion of the complex’s environmental education and interpretation opportunities would also include Small WPA. The existing nature trail at this WPA would be made accessible, and include wildlife interpretation information either in the form of a pamphlet, or a panel. This WPA has the potential for increasing public use, as it is located only 6 miles from Bismarck.

With respect to wildlife observation and photography, the actions highlighted in alternative A would be paralleled. Additionally, wildlife viewing and photography opportunities would be

improved through the development of the aforementioned observation platform and auto tour at Long Lake NWR. The complex staff would also expand the number of permanent and nonpermanent public viewing blinds available throughout the complex. Pamphlets would also be created to include a comprehensive wildlife species list (i.e., birds, mammals, reptiles, amphibians) for the entire complex.

Recreational trapping would be promoted on all refuges within the complex. Recreational trapping would continue to be administered through the issuance of special use permits, because it is an economic activity. No changes would occur to trapping on WPAs.

#### *Habitat Protection and Acquisition*

Same as Alternative A

#### *Threatened and Endangered Species*

Same as alternative A

#### *Monitoring*

Same as Alternative B with the exception of the research and monitoring of wildlife responses to public uses and visitation.

#### *Budget and Staffing*

The intensive management strategies outlined in this alternative would require additional staffing. In addition to the new positions listed in alternative B, several other positions would be needed to accomplish the goals and objectives of this alternative (see table 1)

Operations and maintenance support would need to increase in order to accomplish the actions of this alternative. This would include an increase in staff, equipment, and funding.

This alternative would likely require additional infrastructure in the form of new and improved water management facilities. Additionally, the alternative would require additional staff to achieve the alternative's goal and objectives and consequently, there would be a need for office expansion and new government housing to accommodate this. The alternative would promote expanded public use programs and increased environmental education and interpretive programs, which would require the development of indoor learning facilities. Targeting more intensive upland habitat management practices would also

require increased infrastructure, in the form of equipment storage space.

#### *Partnerships*

Partnership development and management would parallel the direction outlined in alternative B. Additionally, it would encourage the development of partnerships with community members who have an appreciation and interest in the welfare of area refuges by developing Friends Groups.

#### *Additional issues*

Research and monitoring activities would parallel those outlined in alternative B, with the exception of research related to wildlife tolerance to human disturbance: no research would be directed towards that topic. Socioeconomic activities would also parallel those in alternative B; however, under this alternative the staff would engage in the collection and analysis of information regarding expectations and needs of the visiting public. Additionally, the complex's management of cultural resources would parallel those in alternative B.

#### ***Alternative D— Target Species Group-level Modified Management (Proposed Action)***

##### *Summary*

This alternative allows for intensive wetland and upland management, where warranted throughout the complex. Management objectives for various habitat types would be based on habitat preferences of groups of target (indicator) species, which consist of members of various wildlife taxonomic groups (e.g., shorebirds, raptors, waterfowl, wading birds, native gallinaceous birds). Therefore, management objectives for a particular habitat type (e.g., native prairie) would be based on a compromised universal benefit concerning particular life needs of multiple wildlife groups on an individual tract of land. Additionally, public use and environmental education and interpretation opportunities would be maximized to the extent compatible with other objectives. Changes in the complex's research and monitoring, staffing, operations, and infrastructure would likely be required to achieve this alternative's goals and objectives. Partnership opportunities would be maximized and would vary widely.

##### *Water Management*

This alternative would promote a combination of removing and/or decommissioning existing water management facilities to restore natural flooding and evacuation where deemed appropriate, as well

as further development of water management capabilities by considering an outlet for Long Lake (which would allow full drawdown/natural evacuation), and developing other infrastructure (e.g., diversions, channels, pumping stations, additional dikes) to allow water supplies in different pools to be distributed and evacuated more independently. The benefits of these actions include the ability to: 1) provide a full range of options to address habitat requirements of multiple groups of wetland-dependent birds (i.e., waterfowl, shorebirds, wading birds), 2) address a principal resource concern (i.e., botulism), and; 3) address system sustainability concerns.

#### *Upland Habitat Management*

Management of native uplands would be driven by the habitat needs of a group of target species from multiple-bird groups (e.g., passerines, shorebirds, raptors, waterfowl). The focus of complex staff would be to maintain and enhance native prairie through intensive management, in order to provide quality habitat.

Old croplands would be managed for a select group of target species that span several wildlife groups. Management would focus on an ongoing process to convert unsuitable nesting habitat (i.e., cropland, degraded DNC, monotypic cool-season tamegrass stands) to a diverse plant mixture. Species included in the plant mix would be based on historic vegetation composition, soil structure, and requirements of the target species and may be native (e.g., big bluestem) or nonnative (e.g., intermediate wheatgrass). Established native grass stands and the remainder of the disturbed uplands would be periodically managed to rejuvenate grass, reduce litter accumulations, and control undesirable noxious weeds through haying, grazing, burning, and chemical or biological treatments.

Planted and exotic woody vegetation would be managed in a way that provides the greatest overall benefit to a select group of target wildlife species. This alternative would allow for the planting of trees and shrubs if it is decided that it is the most appropriate management direction for the benefit of the selected target species. Conversely, it would allow for the removal of existing planted and exotic trees and shrubs for the benefit of another group of target species. Once the most appropriate management direction is determined, active management will ensue, limited only by personnel and budgetary restrictions.

#### *Predator Management*

Intensive predator management would involve targeting the causes of predation of ground and overwater-nesting birds, which include habitat fragmentation and its associated indirect predation affects. This alternative would promote large-block (i.e., township-level) nesting-season trapping to remove mammalian predators from priority nesting areas. Waterfowl breeding pair density data are available and would aid the Service in selection of priority trapping areas. Raptor perches, tree plantings, rock piles, culverts, and other special sites for predators, would also be targeted for removal, to the extent practical, from and adjacent to, nesting areas. Predation issues that concern specific trust resource situations (e.g., waterbird colonies) would also be addressed. A reduction in habitat fragmentation would also be targeted in this alternative. Large blocks of perennial grassland habitat would be targeted, through restoration, protection, and management. Areas where shelterbelts and other tree plantings are removed would be seeded to perennial grass cover. Additional lands would be acquired, protected, and/or managed to increase block size and further reduce fragmentation and its associated intensified predation affects.

#### *Wildlife Disease*

Management of disease outbreaks would parallel alternative C.

#### *Priority Population Issues*

Same as alternative B.

#### *Public Use*

This alternative promotes completing a fishery resource status survey on select Service-owned lands in the complex and increasing public fishing opportunities where sustainable fisheries are documented and compatible. Access and facilities to support public fishing in these areas would be developed. This alternative would allow boat use in support of fishing with some restrictions (e.g., lift-in, life-out; motor size and horsepower).

The complex's hunting program will be driven by its compatibility with wildlife population objectives. The Service will explore opportunities for increased hunting on all three fee-title refuges within the complex. Examples include possible upland gamebird hunting on Slade NWR and Florence Lake NWR, deer hunting on Florence Lake NWR, and predator (e.g., red fox, coyote) and waterfowl hunting on some or all refuges. Decisions and

details related to the above hunting elements, as well as other possible hunting season framework changes, will be evaluated against various wildlife and human disturbance thresholds. Additionally, the Service plans to increase regulatory hunting signage (e.g., additional *closed to hunting area* signs, *nontoxic shot required* signs) and interpretive materials (e.g., an updated and more comprehensive complex hunting leaflet, hunting tear sheets) in an effort to reduce unintentional hunting violations throughout complex. The only hunting-related changes on WPAs will be improved regulatory signage and interpretive materials.

This alternative would expand the current level and quality of environmental education and interpretation opportunities and facilities to meet the needs of a wide array of target audiences of all abilities. Special emphasis would be placed on Slade NWR and Long Lake NWR, due to their physical characteristics and geographic location, respectively. A plan to rehabilitate the historic stone buildings into a year-round environmental education and interpretive center could be implemented. The Service also plans to construct an observation tower, along with an accessible observation deck overlooking unit II marsh and unit II. The tower and deck would include interpretive panels containing information about the area wildlife. This area is a waterbird concentration area and would give the public an excellent opportunity to view the various species that utilize the marsh and wetland habitats at Long Lake NWR (e.g., ducks, geese, cranes, shorebirds, colonial-nesting waterbirds). To enhance and merge these two projects, complex staff will develop a trail from the stone buildings to the observation tower. Also, a pamphlet will be developed to interpret the sights and sounds along the trail. The Service would also develop an auto tour route using existing roads around Long Lake NWR, along with a pamphlet to interpret popular wildlife viewing locations (see figure 10, public use, alternative D).

Facilities at Slade NWR, as well as other complex lands with public use facilities, would be reviewed, and if necessary, upgraded to meet accessibility standards. At Slade NWR, upgrades would include accessible trails and tables. Signage at the refuge would be reduced by installing a centralized kiosk, which would include rules and regulations, wildlife information, and an interpretive panel about the refuge's history.

The expansion of environmental education and interpretation opportunities would also include Small WPA. The existing nature trail would be made accessible and include wildlife interpretation information either in the form of a pamphlet or a panel. This waterfowl production area has the potential to see an increasing amount of public use because it is located only 6 miles from the city of Bismarck.

Wildlife observation and photography uses would be similar to alternative A, but staff would expand the number of public viewing blinds available on Long Lake NWR. The complex staff would also produce a pamphlet to include a comprehensive wildlife species list (i.e., birds, mammals, reptiles, amphibians, fish) for either Long Lake NWR or the entire complex.

This alternative would promote recreational trapping on refuges administered by the complex, when and where compatible. Recreational trapping would continue to be administered through the issuance of SUPs, because it is an economic activity. On WPAs, recreational trapping is an activity that was approved by legislation.

*Habitat Protection and Acquisition*  
Same as alternative A.

*Threatened and Endangered Species*  
Same as alternative A.

*Monitoring*  
The complex's research, monitoring, and cultural resources activities would both parallel alternative B with the exception of the research and monitoring of wildlife responses to public uses and visitation.

*Budget and Staffing*  
This program expansion would necessitate an increase in complex operations to address program needs that target a "modified management" strategy. In addition to the new staff positions listed in alternative B, one GS-9 outdoor recreation planner would be needed to achieve the goals and objectives of this alternative.

Operations and maintenance would be increased in order to support management of priority resources. An increase in staff, equipment, and funding would be needed to support management. Without increased funding for staffing, equipment, and

supplies, the goals and objectives of this alternative could not be achieved.

#### *Partnerships*

Under this alternative, existing partnerships would be expanded to address resource information needs for a broad group of wildlife species (e.g., ducks, shorebirds, passerines). This alternative would encourage continued work with local, state, and federal agencies to explore new avenues to implement the goals of this alternative. Private land partnerships would be targeted and expanded in order to protect and enhance threatened habitats within the complex. This alternative would also promote developing and fostering partnerships with local communities to inform the public of complex programs and special events.



### Long Lake National Wildlife Refuge

Burleigh & Kidder Counties, North Dakota

Water Control Structures and Water Management Facilities, Alternative A

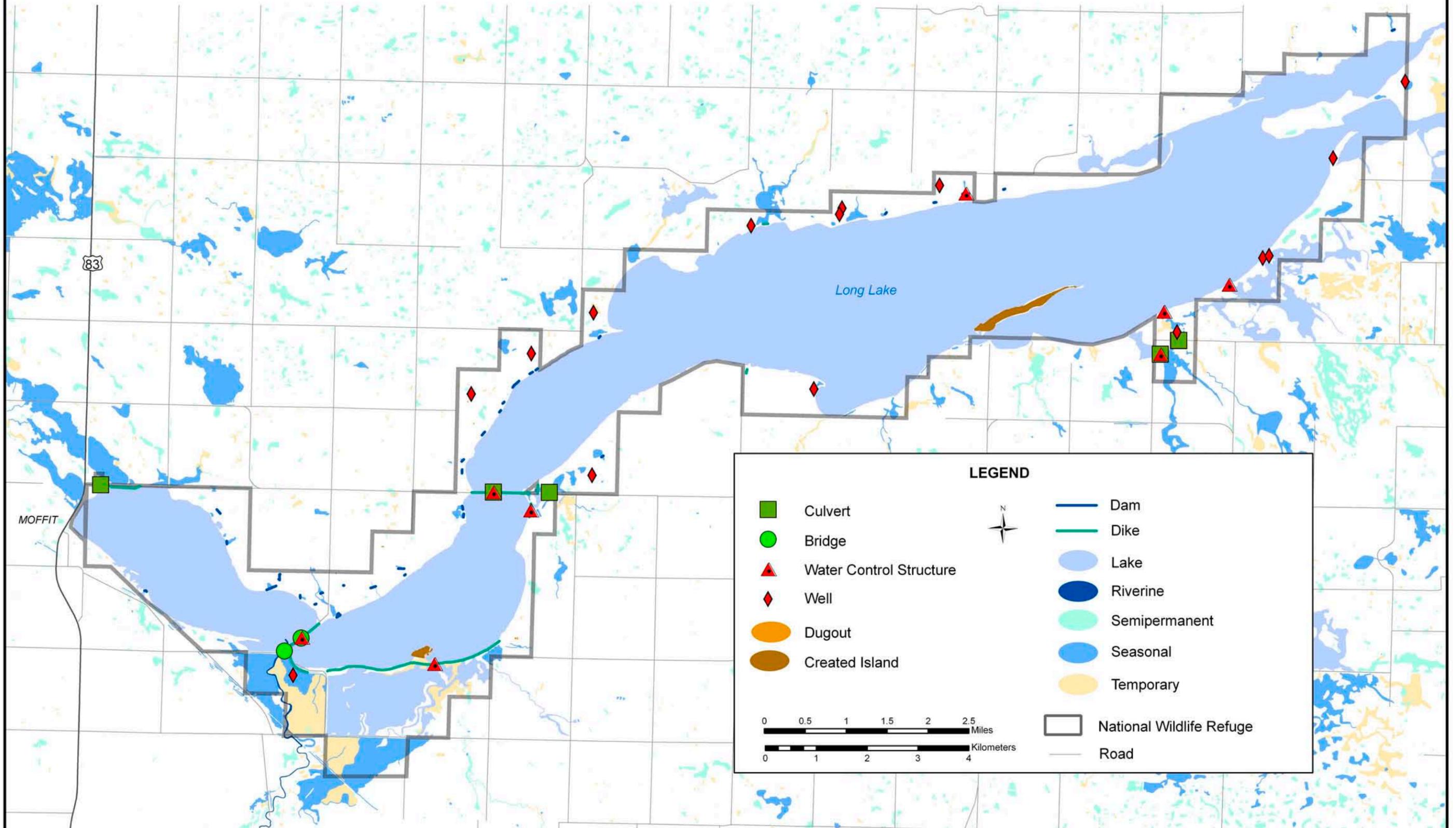


Figure 8: Water Control Structures and Water Management Facilities, Alternative A

# Long Lake National Wildlife Refuge

Burleigh & Kidder Counties, North Dakota

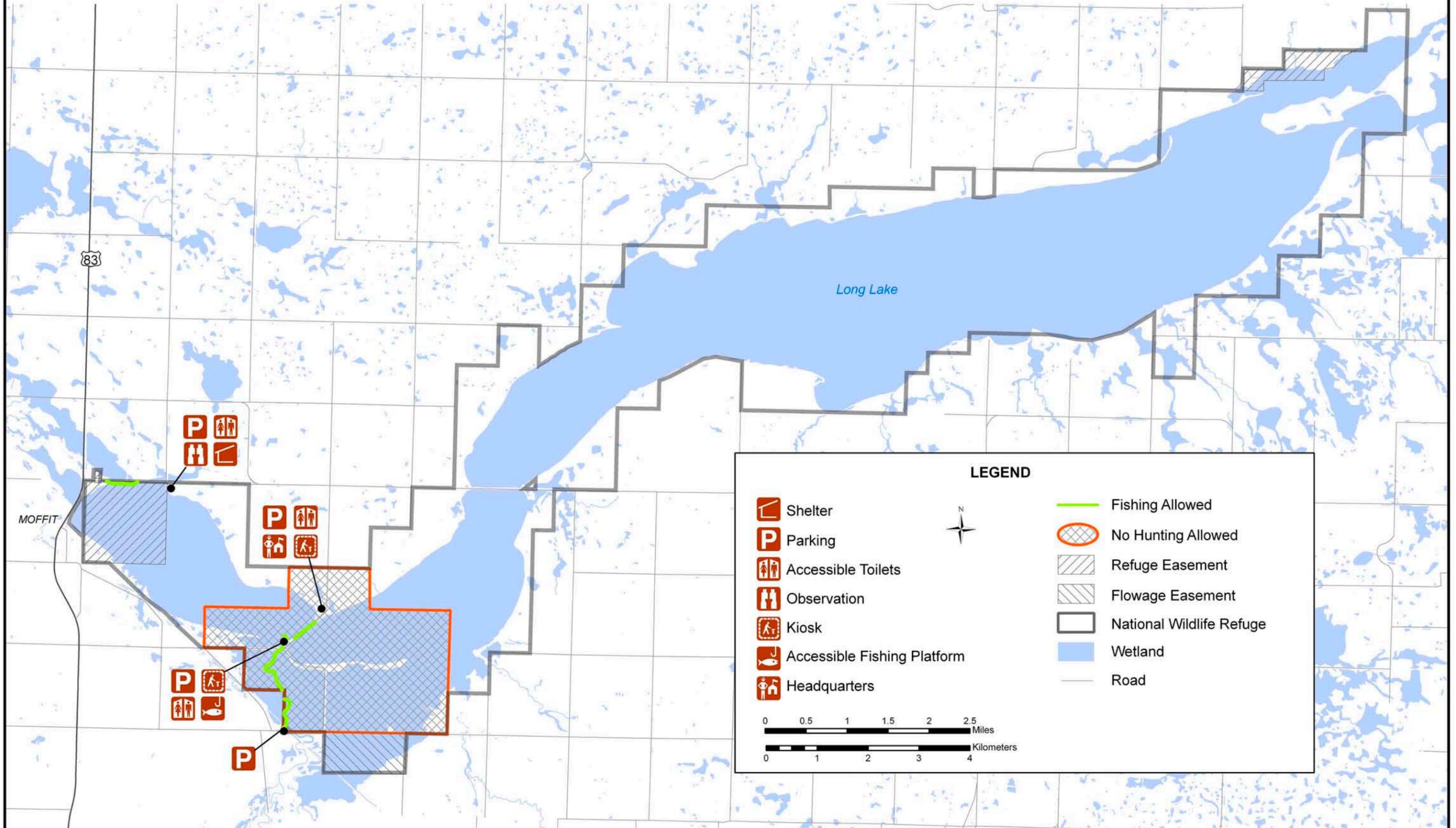


Figure 9: Public use, alternative A

# Long Lake National Wildlife Refuge

Burleigh & Kidder Counties, North Dakota

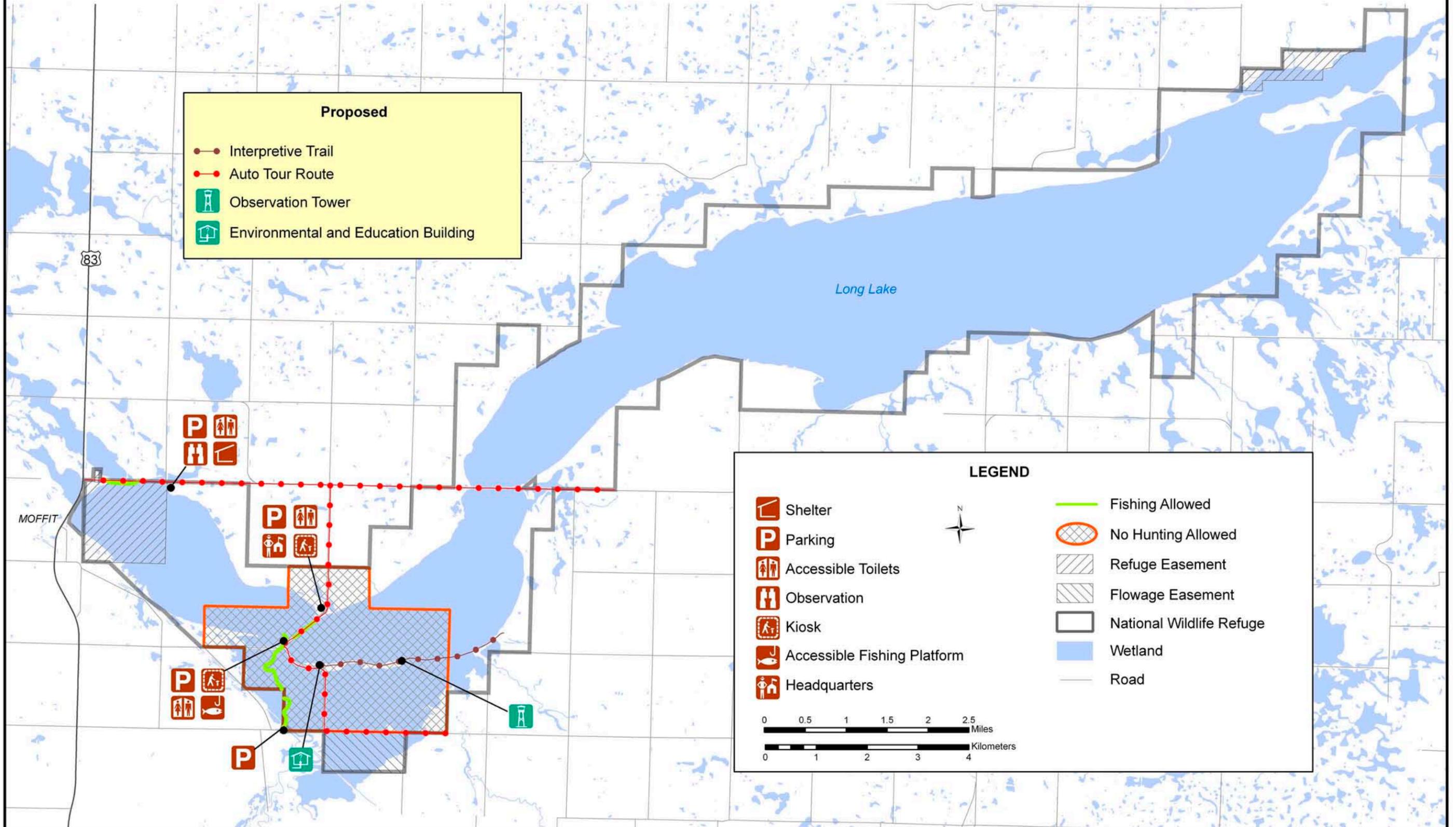


Figure 10: Public use, alternative D



**Table 1. Comparison of alternatives**

	Alternative A (no action)	Alternative B (Natural Processes Management)	Alternative C (Single Wildlife Group-level Intensive Management)	Alternative D (Target Species Group-level Modified Management proposed action)
<b>Habitat and Wildlife</b>				
<b>Developed Wetlands (with WCS - water control structures)</b>	Continue managing water levels through WCSs to prevent or lessen the severity of botulism outbreaks at Long Lake NWR and to produce foods and habitats for migrating waterfowl elsewhere in the complex.	Remove all WCSs from the complex to allow the lakes and wetlands to revert to their natural hydrological regimes to avoid future degradation and restore their natural structure, function, and longevity.	Explore opportunities to increase management of water levels through enhancing existing and/or constructing new WCSs to target habitats for resource-specific needs, including botulism outbreak management.	Explore opportunities to manage water, by developing new WCSs and/or removing existing ones to manage habitats for target wildlife species.
<b>Undeveloped Wetlands (without WCS)</b>	Continue nonmanagement of undeveloped wetlands.	Restore “natural” wetland conditions by removing nonwetland substrate and dredging out siltation and fill.	Enhance specific drainages and/or natural wetland basins to target the habitat needs of specific species or narrow group of birds within a classification (i.e., waterfowl, shorebirds, or marsh birds); Could involve dredging out basins to restore wetland habitat.	Enhance specific drainages and/or natural wetland basins to target the habitat requirements of a guild of species representing a broad spectrum native to the area (i.e. northern pintail, sharp-tailed sparrow, Wilson’s phalarope, sharp-tailed grouse, and ferruginous hawk); Could involve dredging out basins to restore wetland habitat.
<b>Nonnative Trees and Shrubs</b>	Continue to manage on an “as needed” basis. Management includes removal of volunteer trees and shrubs from grasslands; Continue to remove sentinel trees that serve as raptor perches from grassland nesting habitat.	Remove all nonnative trees and shrubs on all lands in the complex.	Manage nonnative trees and shrubs on a tract-by-tract basis allowing actions that provide benefit for a specific wildlife species or narrow group of birds within a classification (i.e., waterfowl, shorebirds, upland birds, game mammals, etc.) This would allow maintaining, augmenting, and/or removing existing trees and shrubs.	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. northern pintail, sharp-tailed sparrow, Wilson’s phalarope, sharp-tailed grouse, ferruginous hawk).

	Alternative A (no action)	Alternative B (Natural Processes Management)	Alternative C (Single Wildlife Group-level Intensive Management)	Alternative D (Target Species Group- level Modified Management proposed action)
Native Upland Habitats (including woody species)	Current management includes grazing, prescribed burning, spraying, clipping, reseeding 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.	Encourage natural processes of native grasslands and target invigorating native plants (composition and diversity); Management of all nonnative uplands would target native plant reestablishment and/or restoration. Maintain native and restored habitats in as “natural” or native condition as possible.	Identify specific habitat requirements of a specific species or narrow group of birds within a specific classification (i.e. waterfowl, or shorebirds, or marshbirds) and target blocks of land to restore and manage for the specific habitat necessary to address those requirements.	Identify the broad habitat requirements of a guild of species representing a broad spectrum native to the area (e.g. northern pintail, sharp-tailed sparrow, Wilson’s phalarope, sharp-tailed grouse, ferruginous hawk) and target restoration and management of all lands to provide habitat necessary to address the requirements representing indicator species across the guild.
Disturbed Upland Habitats	Target converting disturbed uplands to native grass (six to eight species of grasses native to the area with varieties suited to the latitude). Target approximately 250–300 acres per year for restoration. Eventual restoration of forbs into these fields is planned.	Convert disturbed uplands to a diverse native-grass forb mixture representative of the historical vegetation composition on a given site.	Focus on the habitat requirements of a specific species or narrow group of birds within a specific classification. Uplands could potentially remain cropland, tamegrass, or be restored to native grass.	Focus on the habitat requirements of a guild of species representing a broad spectrum native to the area. Ongoing efforts to restore native grasses and forbs with a diversity of height, density, and structure.

	Alternative A (no action)	Alternative B (Natural Processes Management)	Alternative C (Single Wildlife Group-level Intensive Management)	Alternative D (Target Species Group- level Modified Management proposed action)
Predator Management	Maintain current level of predator management— removing solitary trees from nesting areas and issuing trapping permits for predators.	Reduce fragmentation of habitats to restore natural predator/prey relationships; Remove unnatural sites such as trees, rock piles, culverts, etc. Allow trapping and removal of individual predators to targets a more natural balance regarding species composition and population levels.	Intensify management practices to reduce direct causes of predation upon the nesting success of a specific group of ground-nesting birds (i.e. township-level block removal of mammalian predators from high-density waterfowl nesting areas— red/yellow thunderstorm areas; Remove shelterbelts/tree plantings from nesting areas, manage rookeries/islands, etc.	Intensify management practices to reduce direct causes of predation upon the nesting success of multiple of ground-nesting birds (i.e. township-level block removal of mammalian predators from high-density waterfowl nesting areas — red/yellow thunderstorm areas; Remove shelterbelts/tree plantings from nesting areas, manage rookeries/islands, etc.
Wildlife Disease	Continue direct approach to address outbreaks; Remove all carcasses from an affected wetland as soon as the outbreak is discovered; Closely monitor.	Employ active response employed only if an outbreak on Service land posed human health threat.	Same as A; In addition, evaluate effectiveness of management; Employ adaptive management.	Same as A. In addition, evaluate effectiveness of management Employ adaptive management.

	Alternative A (no action)	Alternative B (Natural Processes Management)	Alternative C (Single Wildlife Group-level Intensive Management)	Alternative D (Target Species Group- level Modified Management proposed action)
<b>Public Use, Education and Interpretation</b>				
<b>Hunting</b>	Continue to allow hunting of deer and late-season upland game birds. 15% of Long Lake NWR remains closed to all hunting, with the exception of archery deer. Florence Lake NWR is closed to all hunting. Slade NWR and all WPAs are open to deer hunting (all State seasons). WPAs are open to all other types of hunting consistent with state regulations. Access is limited to foot traffic on all lands except on a few WPAs where motorized vehicle trails are identified	Structured to achieve wildlife population objectives; May require refuge-specific permits for firearms deer hunting on certain tracts (Long Lake NWR and Slade NWR). Liberalize hunting regulations (open seasons and season lengths) to reduce nonnative game species where compatible. Allow Furbearer hunting to reduce nest predator populations to acceptable levels. Access same as A, with the possibility that some access trails would be closed.	Maximize public uses where compatible. Open portions of all refuges to hunting of deer, upland game, furbearers, and waterfowl. Explore potential for improved access and additional opportunities for youth, the physically challenged, etc., along with potential for improving facilities to augment such programs.	Explore opportunities for increased hunting (as long as they are compatibility with wildlife population objectives). Examine hunting issues of various types and address through regulatory changes, if warranted.
<b>Fishing</b>	Maintain fishing program at existing levels. At Long Lake NWR bank fishing is allowed from two areas creek—along the north side of B dike, and the south side of A Dike. Boats would continue to be allowed on long Lake Creek. Allowed on WPAs (gamefish known on two WPAs), no efforts to introduce fish to others. Boats allowed in support of fishing, access limited to lift in/lift out or public R-O-Ws or designated access route.	Same as alternative A except boats would not be allowed on refuge waters.	Promote improved access, where compatible, on Long Lake NWR; Improve fisheries in large wetlands on WPAs and refuges, where compatible with other objectives, and improve facilities to support fishing programs. Allow boats and develop access where fishing programs deemed compatible.	Complete a fishery resource status survey throughout all fee lands in the complex; Increase fishing opportunities where sustainable fisheries are documented and compatible. Develop access and facilities to support fishing. Allow boat use to support fishing.

	Alternative A (no action)	Alternative B (Natural Processes Management)	Alternative C (Single Wildlife Group-level Intensive Management)	Alternative D (Target Species Group-level Modified Management proposed action)
Environmental Education and Interpretation	Sustain environmental education and interpretation programs at existing levels. This includes hosting annual events (Lines for Little Ones, Jakes Day, etc.) as well as being opportunistic in on- and off-site educational programs. Maintain displays and exhibits at the refuge office, along with brochures, signs and public-use facilities in various areas.	In addition to paralleling aspects of alternative A (detailed in previous cell), strive for a more natural (primitive) environmental education and interpretation experience, minimizing off-road and trail impacts and reducing signage to a minimum level.	Expand current level and quality of opportunities and facilities to reach a wide array of target audiences. Focus on Slade NWR and Long Lake NWR. Convert the historical office/shop into an environmental education facility. Increase overlooks, observation tower, trails, interpretive panels and displays, and pamphlets used to facilitate programs. Expand WPA programs and facilities.	Expand current level and quality of opportunities and facilities to reach a wide array of target audiences. Focus on Slade NWR and Long Lake NWR. Convert the historical office/shop into an environmental education facility. Increase overlooks, observation tower, trails, interpretive panels and displays, and pamphlets used to facilitate programs. Expand WPA programs and facilities.
Wildlife Observation and Photography	Promote at current levels. Maintain Long Lake NWR's sharp-tailed grouse blinds. Continue to update bird lists. Continue to offer opportunities to use portable blinds through issuance of SUPs.	Same as alternative A.	Continue actions of alternative A and expand the number of permanent and temporary blinds. Prepare and distribute a comprehensive wildlife species list pamphlet (i.e. birds, mammals, reptiles, amphibians); Construct an observation deck overlooking unit 2. Develop an auto tour route and interpretive pamphlet using existing roads around Long Lake.	Same as alternative C.

	Alternative A (no action)	Alternative B (Natural Processes Management)	Alternative C (Single Wildlife Group-level Intensive Management)	Alternative D (Target Species Group-level Modified Management proposed action)
Trapping	<p>Maintain program at existing level.</p> <p>Continue to issue SUPs on all refuges. Target experienced trappers to assist in management of nest predator populations and populations of mammals that cause damage to infrastructure.</p> <p>Regard trapping on the refuges as a management program, not a recreational one. On WPAs, trapping is a recreational program authorized by legislation.</p>	Same as alternative A	Promote trapping as a recreational opportunity on the refuges, where and when compatible; Continue to regulate through SUPs because trapping is an economic activity. There would be no change in the status of trapping on WPAs.	Same as alternatives A and B

	Alternative A (no action)	Alternative B (Natural Processes Management)	Alternative C (Single Wildlife Group-level Intensive Management)	Alternative D (Target Species Group- level Modified Management proposed action)
<b>Research, Inventory and Monitoring</b>				
<b>Wildlife and Habitats</b>	Maintain the current levels of monitoring. Current research includes: 1) annual surveys of various bird groups, including breeding and migrant shorebirds and waterfowl, grassland passerines, sharp-tailed grouse, pheasants on certain complex lands; 2) monitoring of waterfowl and colonial waterbird nesting efforts; 3) small mammal inventory; vegetation monitoring with baseline mapping and belt transect monitoring of management effects, and; 4) various cooperative research efforts (e.g., CWD monitoring, botulism monitoring, dove banding).	Parallels alternative A and promotes new efforts including: 1) monitoring for improved success of native grass seedings (composition/structure suited to wildlife goals); 2) management effectiveness targeting Kentucky bluegrass and smooth brome; 3) management effectiveness in controlling invasive noxious weeds; 4) water quality parameters of Long Lake and affects on vegetation/ invertebrates/ trust wildlife; 5) increased vegetation monitoring in response to management; 6) affects of increased visitation on various wildlife groups(wildlife response to human disturbance).	Parallels alternative A and promotes new efforts including: 1) monitoring for improved success of native grass seedings (composition/structure suited to wildlife goals); 2) management effectiveness targeting Kentucky bluegrass and smooth brome; 3) management effectiveness in controlling invasive noxious weeds; 4) water quality parameters of Long Lake and affects on vegetation/ invertebrates/ trust wildlife; 5) increased vegetation monitoring in response to management.	Parallels alternative A is same as alternative B.
<b>Socioeconomics</b>	Current lack of knowledge about the experiences that the visiting public has at the complex would continue, as there would be no systematic and meaningful way to obtain and use information.	Search for ways to obtain information on the visiting public's experiences (both qualitative and quantitative) in the complex.	Same as alternative B plus develop means to collect and analyze information on visitors' expectations and needs.	Same as alternative C

	Alternative A (no action)	Alternative B (Natural Processes Management)	Alternative C (Single Wildlife Group-level Intensive Management)	Alternative D (Target Species Group- level Modified Management proposed action)
<b>Cultural Resources</b>				
<b>Documentation and Protection</b>	Require staff to document and protect existing resources and resources (as they are found or discovered) from vandalism, theft, and destruction. Continue to maintain and preserve sites with historical significance.	Promote staff to identify document, and evaluate cultural resources that exist within fee lands throughout the complex. Intensively inventory all areas with high potential for archaeological sites (based on site sensitivity model)— inventory moderate potential areas based on random sampling. Document and evaluate all known sites for eligibility for the National Register. Test excavate a selection of fee title lands with existing archaeological sites to obtain subsurface information that would be used to evaluate the depositional context for the sites.	Same as alternate B	Same as alternates B and C

	Alternative A (no action)	Alternative B (Natural Processes Management)	Alternative C (Single Wildlife Group-level Intensive Management)	Alternative D (Target Species Group- level Modified Management proposed action)
<b>Refuge Operations</b>				
<b>Staffing</b>	Maintain staffing at existing levels (currently 8.8 full-time employees) as follows: refuge manager (GS-13) deputy/wetland manager (GS-12) refuge operation specialist (GS-12) refuge biologist (GS-11) ORP (GS-9) administrative officer (.8 FTE GS-7) range technician (fire GS-6) maintenance worker (NWR WG-8) maintenance worker (WMDWG-8)	Expand program substantially to target a “natural process” management strategy. In addition to the staffing listed in alternative A, the following would be positions needed: refuge operations specialist (Slade GS-9) biological tech (GS-7) fire management officer (GS-11) wildlife biologist (WMD GS-11) maintenance worker (WG-6)	Expand program substantially to target an “intensive management” strategy. In addition to the staffing described in alternatives A and B, the following positions would be needed: administrative clerk (GS-4) park ranger (GS-9) administrative officer (GS-6) biological technician (GS-7) biological technician (GS-7) ORP (GS-9)	Expand program substantially to target a “modified management” strategy. In addition to the staffing described in alternatives A and B, the following position would be needed: ORP (GS-9)
<b>Operations and Maintenance</b>	Continues current levels, including the maintenance of equipment, vehicles, and real property in good working condition to achieve management goals. Staff would continue to operate with current funding and resources.	Requires increased operations and maintenance support for restoration and rehabilitation of altered habitats and ecosystems. Requires increased staff, equipment, and funding.	Requires increased operations and maintenance support for: intensive management of habitats; increased public use; increased outreach; additional WCSs; increased management to maintain restored habitats; increased predator management, increased compatible wildlife-dependent recreational uses.	Requires increased operations and maintenance support for: intensive management of habitats, increased public use, increased outreach, increased habitat restoration, additional WCSs and/or removal of WCSs, increased management to maintain restored habitats, increased predator management, increased compatible wildlife-dependent recreational uses.

Infrastructure	<p>Maintain infrastructure at current levels. Long Lake NWR has the following: office, shop, fire cache building, pole shed, boat storage building, two permanent residences, temporary quarters, historical office/shop, water management facilities:  dikes &amp; WCS, units 1, 2, 3  unit 2 marsh  G-12  G-19  G-19A  Slade NWR, WCS, two primary dikes  Various dikes WCS on WPAs  Primary facilities  WCS and channel at Basaraba WPA  WCS and dike - Rath WPA  WCS and dike  Schiermeister WPA.</p>	<p>Breach or render the water control facilities nonfunctional to restore the natural hydrology to impounded areas. Remove nonnative woody vegetation, intensify reestablishment of natives on disturbed uplands, and increase the management of existing native uplands. Requires additional infrastructure e.g., expanded office space, additional vehicle/equipment storage facilities) to accomplish objectives.</p>	<p>Develop water control facilities to manage more intensively new and/or existing impoundments to meet more effectively the habitat requirements of a species or narrow group of birds within a classification. Requires additional staff, expanded office, and cold storage. The expanded public use, environmental education, and interpretation programs which would require additional infrastructure.</p>	<p>Develop and/or remove water control facilities to manage more effectively new and/or existing impoundments targeting a guild of species representative to the area. Requires additional staff, expanded office, and cold storage. The expanded public use, environmental education, and interpretation programs which would require additional infrastructure. Targeting more intensive management practices would require additional infrastructure to support goals and objectives.</p>
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	Alternative A (no action)	Alternative B (Natural Processes Management)	Alternative C (Single Wildlife Group-level Intensive Management)	Alternative D (Target Species Group- level Modified Management proposed action)
<b>Partnerships</b>				
<b>Partnership Development and Maintenance</b>	<p>Maintain current partnerships to address resource information needs, protect and enhance habitat (both public and private), and promote public use, environmental education, and outreach. Continue to promote partnerships with local landowners through management, grassland and wetland easement acquisition, weed initiatives, and outreach. Continue to promote partnerships with government agencies and NGOs. Maintain partnerships with local wildlife clubs supporting educational events (e.g., JAKES Day and Lines for Little Ones) and foster partnerships with local communities for resource protection (MOUs w/ rural fire districts). Promote continued grant development with partners seeking funding to accomplish mutual goals.</p>	<p>Expand partnerships to address resource information needs related to restoration of altered habitats and ecosystems. Continue work with government agencies at all levels to explore new avenues to accomplish the goals of the “natural processes” alternative. Develop targeted private-land partnerships to protect and enhance threatened habitats. Develop partnerships with local communities to inform the public of available programs (i.e. easement, private lands, environmental education) and important refuge events.</p>	<p>Expand partnerships to address resource information needs for certain species or narrow group (i.e. waterfowl, shorebirds, marshbirds, etc.) requirements. Continue work with government agencies at all levels to explore new avenues to accomplish the goals of the “intensive management” alternative. Develop targeted private land partnerships to protect and enhance habitats targeting a species or narrow group within the complex. Develop partnerships with local communities in order to inform the public of available programs (i.e. easement, private lands, environmental education) and important refuge events.</p>	<p>Expand partnerships to address resource information needs for a guild or broad group of species representative to the area (i.e. northern pintail, sharp-tailed sparrow, marbled godwit, sharp-tailed grouse, ferruginous hawk, etc.) requirements. Continue work with government agencies at all levels to explore new avenues to accomplish the goals of the “modified management” alternative. Develop targeted private land partnerships to protect and enhance habitats targeting a guild or broad group of species representative to lands within the complex. Develop partnerships with local communities in order to inform the public of available programs (i.e. easement, private lands, environmental education) and important refuge events.</p>

