

Chapter 4: Management Direction and Implementation

In this chapter:

[Introduction](#)

[Habitat \(1\)](#)

[Wildlife \(2\)](#)

[People \(3\)](#)

Introduction

This chapter presents the goals, objectives, and strategies that will guide management and administration of the refuges over the next 15 years. This management direction represents the plan for the refuges and mirrors Alternative D in the Environmental Assessment and Draft Comprehensive Conservation Plan that was prepared as a part of the planning process.

The refuges have three goals:

- *Goal 1: Habitat* - Provide quality native grasslands, floodplain forests, wetlands, sandbar, and riverine habitats through land conservation, restoration, and management.
- *Goal 2: Wildlife* - Protect, maintain, and enhance a diversity of resident, migratory, and endangered species native to the Missouri River floodplain.
- *Goal 3: People* - Refuge visitors will understand and appreciate management of the refuges and the Refuge System through participation in diverse wildlife-dependent recreation, environmental education, and outreach opportunities and will understand the progression of change in the Missouri River Valley as reflected through the Steamboat Bertrand Museum Collection and its history.

Goals, objectives, and strategies comprise the proposed future management direction. Goals are descriptive broad statements of desired future conditions that convey a purpose. Goals are followed by objectives, which are specific statements describing management intent. Objectives provide detail and are supported by rationale statements that describe background, history, assumptions, and technical details to help clarify how the objectives were formulated. Finally, beneath each objective there is a list of potential strategies—specific actions, tools, and techniques designed to fulfill the objective. The strategies may be refined or amended as specific tasks are completed or new research and information come to light.

Habitat (1)

Habitat Goal

Provide quality native grasslands, floodplain forests, wetlands, sandbar, and riverine habitats through land conservation, restoration, and management. (See figures 4-1, 4-2, and 4-3.)

Objective 1.1: DeSoto Lake

Within 10 years of CCP approval, manage DeSoto Lake to mimic historic (preregulation) annual hydrological fluctuations and improve riverine fish passage while carefully avoiding impacts to

refuge neighbors; work to improve water quality and to remove DeSoto Lake from the Iowa list of impaired and threatened waters (section 303(d) of the Clean Water Act).

Rationale

In order to manage refuge habitats at benchmark conditions it is important to reestablish fluctuating water levels that support floodplain habitat and the wildlife that depend on these habitats.

DeSoto Lake was listed as a Category Five state impaired water by the Iowa Department of Natural Resources (DNR) under section 303(d) of the Clean Water Act for excessive turbidity in 2004 and 2006, and then for both turbidity and algae in 2008 and their most recent 2010 survey—citing aesthetically objectionable conditions in Secchi and Chl-a tropic surveys conducted between 2002 and 2008. Although the water quality issues in DeSoto Lake are considered a low priority by the state, the refuge can work to address and improve these conditions through on-refuge management actions and off-refuge partnerships. Much of the water that feeds DeSoto Lake enters from three agricultural ditches that drain the lake’s twenty square mile watershed, or from surface flow during rain events. Soil and water conservation efforts in the lake’s watershed can improve its water quality.

Figure 4-1: Projected Future Land Cover Quantities

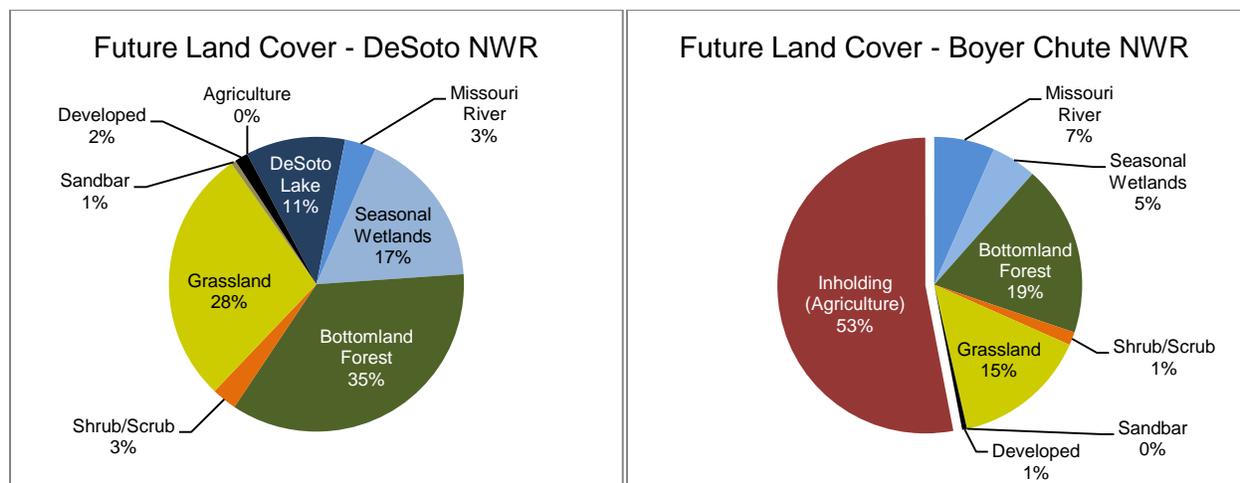


Figure 4-2: Future Land Cover, DeSoto NWR

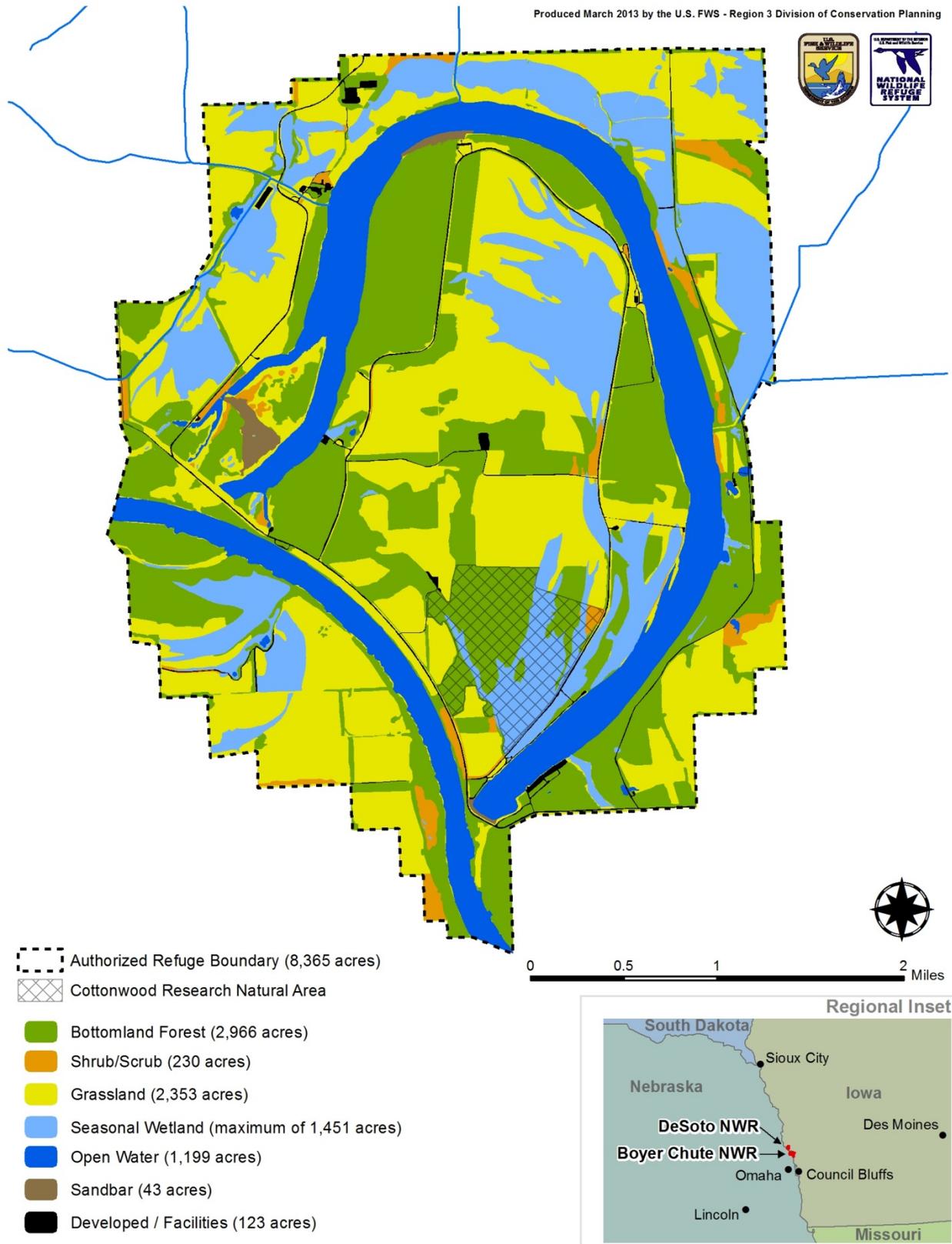
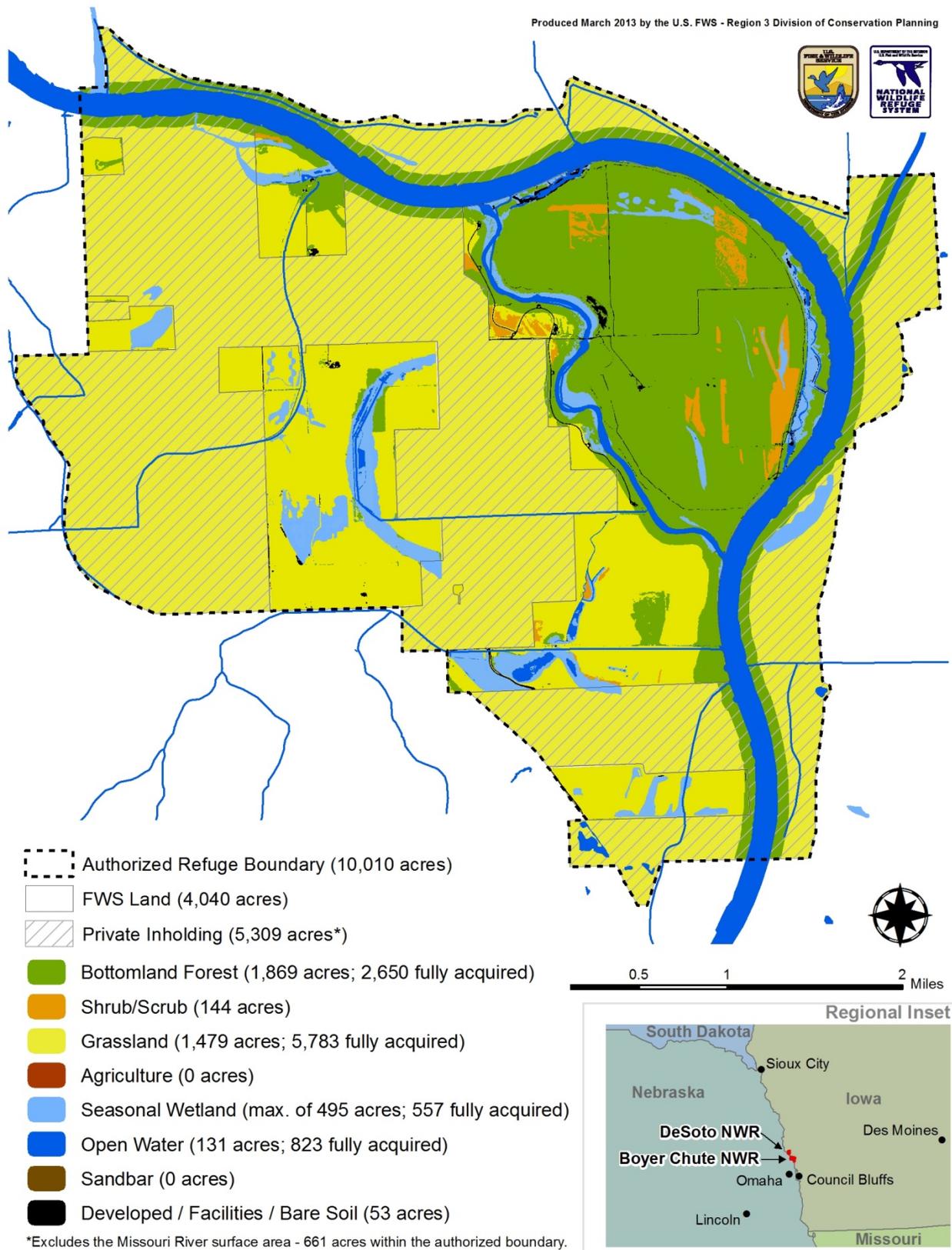


Figure 4-3: Future Land Cover (Assuming Full Acquisition), Boyer Chute NWR



Strategies

1. Use historic data to identify the average hydrograph for the stretch of the Missouri River containing DeSoto and Boyer Chute Refuges.
2. Remain active in efforts to study the hydrology of the area, including the hydrogeomorphic analysis being undertaken by the Service and its partners on the Lower Missouri River.
3. Replace inlet and outlet structures at DeSoto Lake with new structures that improve fish passage and water management capabilities within 10 years of CCP approval.
4. Use water control structures as needed to adjust seasonal water levels in DeSoto Lake.
5. Use wetlands to prefilter water entering DeSoto Lake from surrounding agricultural lands and associated drainage ditches.
6. Update DeSoto Lake water quality monitoring protocols in an inventory and monitoring step-down management plan to be completed within three years of CCP approval.
7. Continue to use the Partners for Fish and Wildlife program to work with landowners in the DeSoto Lake drainage basin (see chapter 3 for additional information).

Objective 1.2: Seasonal Wetlands

DeSoto National Wildlife Refuge (NWR, refuge): Annually manage for seasonal wetlands that range from approximately 100 acres (dry conditions during nonmigratory periods) to 1,500 acres (full capacity in wet conditions during migrations); annually rotate management for mudflats, annual vegetation, and perennial vegetation.

Boyer Chute NWR: Given current acquisition status, annually manage for seasonal wetlands that range from 30 acres (dry conditions during nonmigratory periods) to 500 acres (full capacity in wet conditions during migrations). Assuming full acquisition of authorized boundary, annually manage for seasonal wetlands that range from approximately 30 acres (dry conditions during nonmigratory periods) to 1,200 acres (full capacity in wet conditions during migrations).

Rationale

Enhancing and maintaining the integrity of existing wetland habitat and restoring degraded wetlands to benchmark conditions is important for numerous reasons. The following list cites some of the key reasons:

1. It is National Wildlife Refuge System (NWRS, Refuge System) policy as mandated by the National Wildlife Refuge Improvement Act of 1997 to “ensure that the biological integrity, diversity, and environmental health of the System are maintained . . . ,” which provides guidance to restore and maintain “biotic composition, structure, and functioning at genetic, organism, and community levels comparable with historic (benchmark) conditions . . .” on refuge lands where appropriate.
2. According to the Iowa DNR’s 2010 “Wetland Action Plan for Iowa,” Iowa has lost 90–95 percent of its original 4–6 million acres of wetlands (Evelsizer and Johnson 2010). The State of Nebraska has lost approximately one million acres (about 35 percent) of the state’s original wetland acreage in the last 200 years (Dahl 1990).

3. A mosaic of wetland habitat types on the landscape would support an abundant and diverse array of wildlife species.
4. Wetlands provide a multitude of ecosystem services that benefit both humans and wildlife—from flood control to improving water quality.

The short- and long-term objectives described in this CCP strive to maximize acres of refuge wetlands by protecting existing wetland habitat and restoring wetland areas that have been altered or degraded. There are areas of both refuges that have the environmental factors (soils, hydrology, relief, etc.) to support wetland habitat. Minor modifications in surface drainage and the addition of supplemental water will allow the refuges to create new seasonal wetland habitat during critical migration periods.

Although a number of factors, including climate change, have the potential to affect fundamental ecosystem conditions and balances, historic records still form a benchmark by which management can gauge the level of habitat alteration and disturbance and use this information to guide restoration.

In addition, it is important to acknowledge the natural range of variation within each habitat type, both spatially and temporally, that is brought about by disturbance and local environmental factors. Selecting a range of target conditions and habitat acreages is a more accurate and less risky way to identify desired conditions than with exact quantities; however, numerical ranges can obscure the precision of existing data. Therefore, exact numbers are identified for the habitat objectives with the understanding that the numbers are approximations based on the best available information. Furthermore, annual fluctuations in water levels make it nearly impossible to pinpoint exact desired acreages for wetland habitat types, particularly open water and emergent marsh. Nonetheless, an average of current and preexisting conditions obtained from a variety of sources, including an analysis of aerial imagery, the National Wetlands Inventory; U.S. Department of Agriculture, Natural Resources Conservation Service soils data; and presettlement vegetation estimates make it possible to establish target acreages—fully acknowledging the limitations of these data sources and resulting numbers.

In addition to rain and river water from periodic flood events, water will be pumped into wetlands from refuge agricultural ditches, DeSoto Lake, and groundwater sources. Surface waters directed into wetlands have the benefit of filtering and processing agricultural runoff from adjacent lands. Nutrients in agricultural runoff can help to increase the primary and secondary productivity in wetlands, augmenting food resources for wildlife.

The local benefits of diverse wetland habitats to bird species and other wildlife are well documented. Open water, emergent marsh, and sedge meadow habitats on the refuges are essential stopover sites during spring and fall migrations, supporting an average of 3 million waterfowl use days; a mix of divers, dabblers, and geese; and numerous other migratory bird species. There are notable concentrations of Northern Pintail, Mallards, Blue-winged Teal, Green-winged Teal, Ring-necked Ducks, White-fronted Geese, and Canada Geese in the spring and fall.

Strategies

1. Complete a habitat step-down management plan within five years of CCP approval.

2. Identify and restore wetland habitats and hydrology by using historical vegetation descriptions, soils data, and other data sources.
3. Manage wetlands to provide for a variety of habitats (mudflat, annual and perennial vegetation) needed to support species that depend on wetlands for their life cycle.

Objective 1.3: Grasslands

DeSoto NWR: Over the life of the CCP manage for approximately 2,350 acres of mesic and wet grasslands.

Boyer Chute NWR: Over the life of the CCP, manage for approximately 1,500 acres of mesic and wet grasslands, given current acquisition status. Over the life of the CCP, manage for approximately 5,800 acres of mesic and wet grasslands, assuming full acquisition of authorized boundary.

Rationale

As mandated by the National Wildlife Refuge Improvement Act of 1997, it is Service policy to “ensure that the biological integrity, diversity, and environmental health of the System are maintained . . .” Service policy provides guidance to restore habitat to historical benchmark conditions on refuge lands where appropriate and possible. Much of the refuges’ uplands were once prairie but were converted to agricultural fields over the last 100 years. Newly acquired refuge lands (within the Boyer Chute NWR authorized boundary) containing farm fields should be converted to prairie with native, local ecotype seed as a step toward restoring the lands to conditions associable with the presettlement period. Prairie is considered one of the most endangered ecosystems in the country. According to the Iowa Wildlife Action Plan, of the 30 million acres of prairie that once covered Iowa only 0.1 percent remains (Zohrer 2006). The Nebraska Wildlife Action Plan states that approximately 2 percent of the original tallgrass prairie remains in Nebraska—mostly in parcels less than 80 acres in size (Schneider et al. 2005). The majority of this loss can be attributed to conversion to agriculture. As a result, many of the grassland birds and other wildlife associated with this habitat are also declining. By restoring prairies, the refuges would provide critical habitat for declining grassland birds and other wildlife and plant species.

Strategies

1. Identify and map the wet and mesic grassland habitat with the highest potential for restoration within the boundaries of the refuges.
2. Research historical vegetation records to assist in refining benchmark conditions.
3. Expand vegetation monitoring to include periodic field-based species richness surveys and GIS-based land cover analysis.
4. Further define refuge habitat management in a step-down management plan within five years of CCP approval.
5. Restore natural ecological processes and functions such as fire and local hydrology to support these grassland habitats.

Objective 1.4: Wooded Habitats (Bottomland Forest, Cottonwood Parkland, and Shrub/Scrub)

DeSoto NWR: Over the life of the CCP, continue to manage for approximately 3,200 acres of native bottomland forest, cottonwood parkland, and shrub/scrub, managing these habitats for structural and species diversity. Maintain large mature stands of bottomland forest with a diverse, dense understory component to provide nesting habitat for Yellow-billed Cuckoos, Chestnut-sided Warblers, Wood Thrush, and woodpecker species.

Boyer Chute NWR: Over the life of the CCP, allow the Center Island Unit and riparian buffers (approximately 100 meters) along the Missouri River and Boyer Chute to succeed to bottomland forest (estimated 1,850 wooded acres within existing landholdings, and 2,650 wooded acres with full acquisition).

Rationale

Bottomland forests provide an important riparian habitat buffer for many watercourses on the refuges. This buffer helps improve water quality, protect refuge soils, and provide habitat for a diversity of native wildlife. In addition, a number of bottomland forest-dependent migratory songbirds are declining as a result of habitat loss and fragmentation. Conservation and management of suitable bottomland forest habitat is a principal strategy for maintaining healthy, self-sustaining populations of these birds.

Strategies

1. Promote natural regeneration of cottonwood bottomland forest on the refuges.
2. Where necessary, plant endemic Missouri River floodplain species that will enhance the bottomland forest communities, will re-establish missing historic plant community species, and are appropriate for contemporary Missouri River floodplain conditions.
3. Conduct a land cover/vegetation assessment across both refuges that distinguishes the habitat types covered by the CCP objectives at least once every 10 years.

Objective 1.5: Agriculture

DeSoto NWR: After CCP approval, eliminate the cooperative farming program and limit the use of farming techniques (not to exceed 200 acres annually) to scattered plots for habitat management needs.

Boyer Chute NWR: No cooperative farming program exists or is planned for Boyer Chute NWR.

Rationale

The use of farming techniques has long been recognized as a valuable habitat management tool on refuges. It can be used to set back succession, prepare seedbeds, control exotic, noxious, and invasive weeds, and meet other management objectives while providing supplemental food for biannual migrations. However, there are also concerns about genetically modified organisms and pesticide use associated with farming. In the past, agriculture was a larger part of the refuges' habitat management program, and the cooperative farming program provided an opportunity to minimize refuge equipment and personnel costs, support the local

economy, and promote relationships with refuge neighbors. The refuge now proposes to use agricultural practices to achieve long-range habitat goals and to address exotic, invasive, or noxious plants. Since these areas will be sprayed or disked anyway to control these species, this objective allows us to plant a cover crop to provide erosion control and offer a food source for migration.

Strategies (DeSoto NWR)

1. Upon CCP approval, eliminate cooperative and financial incentive farming, and reduce the use of farming techniques for habitat management to levels specified in the objective (generally not to exceed 200 acres per year).
2. Use farming techniques as habitat management needs and staff levels warrant over the life of the CCP.
3. Use annual planning activities to determine the extent farming techniques for habitat management will be used on the refuge each year. Areas planted will be limited to areas that require control of exotic, invasive, and/or noxious plants.
4. No genetically modified organism (GMO) crops or neonicotinoids will be used on the refuge.
5. Adhere to all regional and national guidance/policy regarding farming and pesticide use on refuges.
6. Planted crops will generally be limited to small grains that can offer both erosion control and food value for wildlife.
7. No crops will be planted or harvested for commercial market or sale.
8. All crops will be left in the field as a supplemental food source for wildlife.

Objective 1.6: Land Acquisition

DeSoto NWR: The authorized refuge boundary is fully acquired at 8,365 acres. Over the life of the CCP, continue to evaluate acquisition opportunities for important habitats adjacent to the refuge, the sum not to exceed 10 percent of the existing refuge acreage.

Boyer Chute NWR: Over the life of the CCP, continue to use priorities established in the 1997 expansion document (FWS 1997) to guide acquisition of the remaining inholdings (5,309 acres excluding the Missouri River surface area) within the authorized 10,010-acre refuge boundary.

Rationale

Land acquisition (fee title) is an important tool for permanently protecting wildlife habitat. The Refuge System identifies land protection priorities, and then designates formal boundaries within which acquisitions can be made at fair market value from willing landowners. By extending permanent protection to important natural resources of the Nation, the Refuge System is sustaining wildlife and habitats, “for the benefit of present and future generations of Americans” as directed by the mission of the Refuge System. Protection emphasis at Boyer Chute NWR is focused first on land that retains natural cover types, and then extends to those areas that have the greatest potential for the restoration of priority habitats such as wetlands, bottomland forests, and grasslands. Protection of habitat also extends benefits to other

important aquatic resources, wildlife, and habitat—while providing valuable open space and recreation opportunities to the public.

Strategies (Boyer Chute NWR)

1. Actively work with partners to secure lands via grant opportunities, donations, bequeaths, and purchases.
2. Provide accurate and up-to-date land acquisition information to landowners within the refuge acquisition boundary.
3. Where land acquisition is not practical within the refuge acquisition boundary, work to obtain conservation easements.

Objective 1.7: Invasive Plant Species

Both refuges: Monitor extent of invasive plant species annually, and maintain refuge habitats with less than 15 percent adversely impacted by invasive plant species.

Rationale

Invasive plant species are often introduced from other areas, typically Europe or Asia, and they rarely have adequate native biological controls in the United States. The plants are often early successional species adapted to disturbance that move in quickly. They are difficult to control and interfere with natural ecological processes. If the invasive plant species are not controlled they can out-compete and displacing native flora, reducing the habitat's biological integrity and benefit to native wildlife.

Strategies

1. Document the location and size of invasive populations on the refuges using GIS.
2. When available, use biological controls as a preferred strategy.
3. Where appropriate, use prescribed fire to control invasive plant species.
4. Use chemical and mechanical means to control infestations in cases where biological control techniques are not available, feasible, or practical.
5. Monitor invasive species infestations and the effectiveness of control measures taken.
6. Support and work with the Service's Partners for Fish and Wildlife program and refuge partners and neighbors to provide education and services (identification, mapping, and control programs) related to invasive species within a 15-mile radius of the refuges.

Wildlife (2)

Wildlife Goal

Protect, maintain, and enhance a diversity of resident, migratory, and endangered species native to the Missouri River floodplain.

Objective 2.1: Waterfowl

Both refuges: Over the life of the CCP, provide for the seasonal stopover needs of migratory waterfowl with a target of three million waterfowl use days per migration period, ensuring a thorough waterfowl monitoring program.

Rationale

First and foremost, DeSoto NWR's primary establishment purpose is to provide an inviolate sanctuary for migratory waterfowl. In addition, conserving a diversity of fish, wildlife, and plants and their habitats, including threatened and endangered species is one of the fundamental goals of the Refuge System.

It is necessary to monitor outcomes to evaluate whether or not management actions are having the predicted outcomes. A representative sample of sites and conditions is used to ensure that, on average, the effects of a particular treatment match expectations. Information gained through monitoring that is clearly linked to refuge management actions helps the refuges learn and adapt, increasing the overall effectiveness in meeting conservation objectives.

Strategies:

1. Over the life of the CCP, continue weekly waterfowl counts during the fall (September to January) and spring (March to May) migrations, and continue conducting the Mid-Winter Waterfowl Survey in collaboration with state partners.
2. Include all waterfowl species in surveys and monitoring efforts; focal species will include Canada Geese and dabbling ducks (including Northern Pintails, Mallards, and Blue-winged Teal).
3. Further refine monitoring efforts for the refuges in an inventory and monitoring step-down management plan within three years of CCP approval.
4. Annually manage refuge wetland habitats to provide enough food to support seasonal migration of waterfowl in excess of three million waterfowl use days.
5. Continue to provide refugia and areas of minimal disturbance for birds during critical migration periods, including wetland areas and DeSoto Lake.
6. Investigate the potential benefits of closing the west arm of DeSoto Lake for the migration one month earlier (September 14 instead of October 14).

Objective 2.2: Shorebirds

Both refuges: Increase shorebird use on both refuges by improving habitat management and refining monitoring efforts as described in the associated strategies.

Rationale

Conserving a diversity of fish, wildlife, and plants and their habitats, including threatened and endangered species is one of the fundamental goals of the Refuge System. Furthermore, one of the purposes of the refuge is to provide habitat for migratory birds. Migratory shorebird conservation is a priority for the refuges, and refuge management strives to support the goals identified in the U.S. Shorebird Conservation Plan (Brown et al. 2001). By providing quality

habitat, the refuges contribute to shorebird numbers at the local level, which helps maintain shorebird populations at the continental level.

To evaluate whether or not management actions are having the predicted outcomes, it is necessary to monitor outcomes. A representative sample of sites and conditions is used to ensure that, on average, the effects of a particular treatment match expectations. Information gained through monitoring that is clearly linked to refuge management actions helps the refuges learn and adapt, increasing the overall effectiveness in meeting conservation objectives.

Strategies

1. Establish baseline shorebird use on the refuges, set migratory stopover targets for the refuges, and complete an inventory and monitoring step-down management plan further defining shorebird monitoring and management within three years of CCP approval.
2. Conduct seasonal monitoring of migratory shorebirds on the refuges in three-year cycles (begin within three years of CCP approval). Annual monitoring recommended by the Service's Midwest Division of Migratory Birds for the refuges includes three spring surveys (April 1–10, May 10–20, and May 20–30) and three fall surveys (July 15–30, August 15–30, and September 15–25).
3. All shorebird species will be included in surveys and monitoring; however, focal species will include Greater Yellowlegs, Lesser Yellowlegs, Pectoral Sandpiper, Short-billed Dowitcher (less common), and Hudsonian Godwit.
4. Provide 200 acres of shorebird habitat (i.e., mudflats) annually.
5. Within the life of the CCP, develop a research project to assess the potential benefits of providing sandbar habitat and the feasibility of restoring and maintaining sandbar habitat on the refuges.
6. Continue to collaborate with the U.S. Army Corps of Engineers (Corps) to develop shallow water and sandbar projects that provide shorebird habitat in support of the 2000 "Missouri River Biological Opinion," as amended.

Objective 2.3: Secretive Marshbirds

Both refuges: Increase secretive marshbird use on both refuges by improving habitat management and refining monitoring efforts as described in the associated strategies.

Rationale

Conserving a diversity of fish, wildlife, and plants and their habitats, including threatened and endangered species is one of the fundamental goals of the Refuge System. Furthermore, one of the purposes of the refuge is to provide habitat for migratory birds. Secretive marshbird conservation is a priority for the refuges, because marshbird populations are declining across North America according to the Breeding Bird Survey (Sauer et al. 2008). As a result, several species have acquired a federal, state, or local conservation status. Furthermore, secretive marshbirds are difficult to detect and adequately monitor because of their tendency to occupy dense vegetation and vocalize infrequently. Monitoring will allow the refuge staff to track population trends locally and improve our understanding of how the populations respond to habitat changes and associated management actions. Information gained through monitoring

that is clearly linked to refuge management actions helps the refuges learn and adapt, increasing the overall effectiveness in meeting conservation objectives.

Strategies

1. Establish baseline secretive marshbird use on the refuges and complete an inventory and monitoring step-down management plan further defining secretive marshbird monitoring and management within three years of CCP approval.
2. Ensure that future habitat management step-down management plan considers fall migratory habitat for secretive marshbirds.
3. Use secretive marshbird monitoring data to establish population targets for the refuges.
4. Conduct seasonal monitoring of breeding secretive marshbirds on the refuges in three-year cycles within three years of CCP approval. Annual monitoring recommended by the Service's Midwest Division of Migratory Birds for the refuges includes two annual surveys (May 15–31 and June 1–15).
5. All secretive marshbird species will be included in surveys and monitoring; however, focal species will include Sora, Virginia Rail, Black Rail (very rare), and King Rail (very rare).
6. Provide an additional 100 acres of wet meadow habitat in support of secretive marshbird species.

Objective 2.4: Grassland Birds

Both refuges: Improve habitat management and refine monitoring efforts for grassland birds as described in the associated strategies.

Rationale

Conserving a diversity of fish, wildlife, and plants and their habitats, including threatened and endangered species is one of the fundamental goals of the Refuge System. Furthermore, one of the purposes of the refuge is to provide habitat for migratory birds. Grassland birds are uniquely adapted to a specific suite of habitat features (grass heights and densities) that were historically created by disturbance mechanisms such as large-scale herbivory and prairie fires. The loss of these disturbance mechanisms and the overwhelming conversion of prairie habitat to agriculture have led to steeper, more consistent, and more widespread population declines over the past 25 years than any other avian guild in North America. Grassland bird species are increasingly dependent on land managers for the habitats they require. A diversity of grassland habitats were endemic to the Missouri River floodplain, and a large portion of both refuges is dedicated to providing these habitat types.

Monitoring is a key aspect of grassland bird management. To evaluate whether or not management actions on habitat conditions are having the predicted outcomes, it is necessary to monitor outcomes in the bird populations. A representative sample of sites and conditions is used to ensure that, on average, the effects of a particular treatment match expectations. Information gained through monitoring that is clearly linked to refuge management actions helps the refuges learn and adapt, increasing the overall effectiveness in meeting conservation objectives.

Strategies

1. Establish baseline grassland bird use on the refuges and complete an inventory and monitoring step-down management plan further defining grassland bird monitoring and management within three years of CCP approval.
2. Use grassland bird monitoring data to establish population targets for the refuges.
3. Begin conducting seasonal monitoring of breeding grassland birds on the refuges in three-year cycles within three years of CCP approval. Annual monitoring recommended by the Service's Midwest Division of Migratory Birds for the refuges consists of one survey (June 1–15).
4. All secretive marshbird species will be included in survey and monitoring efforts; however, focal species will include Eastern Kingbird and Western Meadowlark during dry years and Sedge Wren and Henslow's Sparrow (rare) during wet years.
5. Provide a combined grassland habitat acreage of approximately 3,350 on the refuges.
6. Provide for the migratory habitat needs of grassland birds by creating diverse successional habitat through periodic disturbance (fire, herbivory, mowing, and agriculture).
7. Use diverse, local-ecotype seed sources for grassland plantings.

Objective 2.5: Fish and Aquatic Species

Both refuges: Over the life of the CCP, support the viability and health of riverine fish and aquatic threatened and endangered species populations through collaborative monitoring and habitat management programs as described in the associated strategies.

Rationale

Conserving a diversity of fish, wildlife, and plants and their habitats, including threatened and endangered species is one of the fundamental goals of the Refuge System. While the majority of waters within the authorized refuges' boundaries are managed by Service, the Corps maintains jurisdiction over the Missouri River. The vast majority of federally and state listed fish, aquatic invertebrates, and other aquatic species occur within the Missouri River and its associated riverine habitats. The refuges can provide benefits to these species by working collaboratively with the its partners including the Corps and by supporting the restoration of river-associated habitats.

Strategies

1. Completing an inventory and monitoring step-down management plan further defining fish and aquatic species monitoring and management within three years of CCP approval.
2. Improve connectivity of DeSoto Lake and the Missouri River so that lake can better support endemic riverine fishes.
3. Continue to assist and partner with other agencies to monitor trends of aquatic threatened and endangered species and other native riverine species.

4. Continue collaborating with the Corps to develop shallow water habitat projects in support of the 2000 “Missouri River Biological Opinion,” as amended.
5. Assess DeSoto Lake for breeding and over-wintering habitat on a five-year cycle.
6. All fish species will be included in survey and monitoring efforts; however, focal species will include pallid sturgeon, paddlefish, shovelnose sturgeon, and lake sturgeon.

Objective 2.6: Game Species

Both refuges: Over the life of the CCP, maintain a target post-hunt deer population of 17 deer per square mile on both refuges; continue deer monitoring surveys conducted once every 2–5 years; and increase management and monitoring of quail populations.

Rationale

Hunting is one of the six compatible, wildlife-dependent recreational uses. Careful monitoring and management of game species can help prevent negative impacts to associated habitats and wildlife, including overgrazing, disease, and starvation. Overgrazing by deer can lead to changes in plant community composition and structure, which can result in negative impacts to other plant and animal species. In addition to impacts on biological resources, game species populations can have impacts on neighboring properties, area businesses, and the local economy. Game management decisions are based on a firm understanding of the size and trends of local populations, which is dependent on regular monitoring. It is important to understand the dynamics of local emigration and immigration, which impacts the population size and density, making game species populations variable from year-to-year.

Strategies

1. Continue deer monitoring surveys conducted once every 2–5 years, over the life of the CCP.
2. DeSoto NWR’s acreage (non-water surface) of approximately 7,166 acres (11.19 sq. mi.) should support 190 deer, and Boyer Chute NWR’s acreage of 4,040 land acres (6.31 sq. mi.) should support 107 deer.
3. Within five years begin monitoring quail populations on the refuges in partnership with state agencies.
4. Further refine game species monitoring by completing an inventory and monitoring step-down management plan within three years of CCP approval.
5. Manage for grassland bird migratory habitat with diverse successional stages and a high proportion of annuals to benefit refuge quail populations.

Objective 2.7: Federally Threatened and Endangered Species

Over the life of the CCP, continue to monitor federally listed species trends and manage for refuge conditions that benefit federally threatened and endangered species endemic to refuges, including the Piping Plover, Interior Least Tern, and pallid sturgeon.

Rationale

It is a priority for the refuges to monitor and protect rare, threatened, and endangered species because they are trust resources of the Service and it is a goal of the Refuge system. It is also required by the Endangered Species Act of 1973, “that all Federal departments and agencies shall seek to conserve endangered and threatened species . . .” All living things are part of a complex, often delicately balanced network within an ecosystem . It is difficult to predict how the extinction of organisms will affect other members of its ecosystem, but the removal of a single species can set off a chain reaction affecting many others (FWS 2005). It is important that the refuges contribute, where possible, to the agency mission of protecting species from extinction.

Currently there are no federally listed endangered species inhabiting DeSoto and Boyer Chute Refuges, but the refuges support several state listed species and many Midwest Region Resources of Conservation Concern (RCC) species. Bald Eagles were once listed as a federally threatened species. They were delisted on August 9, 2007, moved to a protected status, and remain an RCC species in the Midwest Region. Bald Eagles are commonly observed in the area during spring and fall migration, and DeSoto NWR currently supports one nesting pair. Because of its recent delisting and its protected status in Region 3, Bald Eagles should be monitored and considered during management activities. Over time, and as additional research takes place, species may be added or removed from state and federal lists. Thus, it is necessary for the refuge to maintain an adaptive management approach regarding individual species protection and monitoring.

Strategies

1. Maintain close coordination with the Service’s Division of Ecological Services and with partners to monitor the status of federally threatened and endangered species on the refuges.
2. Continue to partner with the state and federal agencies to restore habitats recommended by the 2000 “Missouri River Biological Opinion,” as amended, that benefit threatened and endangered species along the Missouri River corridor.
3. Investigate the feasibility and potential to create or improve sandbar habitat for terns and plovers on the refuges.
4. Include considerations for federally listed species in the development of the inventory and monitoring step-down management plan.
5. Monitor Bald Eagle nesting activities and adjust management to minimize disturbance in these areas during key periods of the year.

People (3)

People Goal

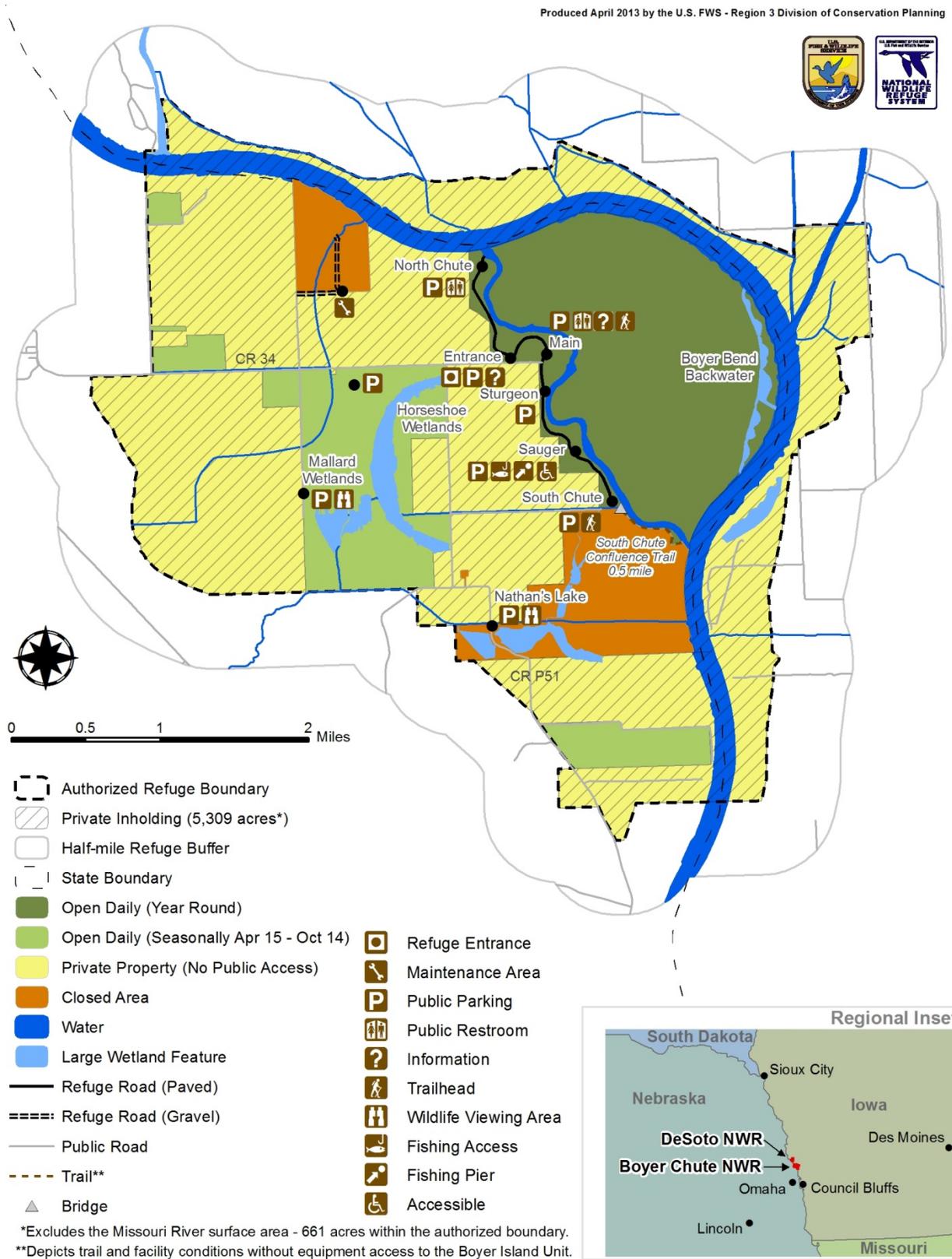
Refuge visitors will understand and appreciate management of the refuges and the Refuge System through participation in diverse wildlife-dependent recreation, environmental education, and outreach opportunities and will understand the progression of change in the Missouri River Valley as reflected through the Steamboat Bertrand Museum Collection and its history. (See figures 4-4 and 4-5.)

Figure 4-4: Future Visitor Services, DeSoto NWR



Figure 4-5: Future Visitor Services, Boyer Chute NWR

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Objective 3.1: Hunting

Both refuges: As compared to current conditions, increase upland (Wild Turkey and Ring-necked Pheasant) hunting opportunities, big game (deer archery) hunting opportunities, and consider increased waterfowl hunting opportunities on the refuges through the development of a hunting step-down management plan that will be completed within one year of CCP approval.

Rationale

Hunting is one of the six priority wildlife-dependent recreational uses identified in the National Wildlife Refuge System Improvement Act of 1997. Service policy directs us to provide hunting opportunities when compatible with refuge management. Increasing hunting opportunities was also identified as a need in the 2011 visitor survey conducted at DeSoto NWR (Sexton et al. 2011). Managed hunting programs help promote an understanding and appreciation of natural resources and their management. Properly planned and managed hunts on the refuges provide a traditional recreational activity with negligible adverse impacts to the biological integrity or habitat sustainability of refuge resources. Due to the loss of large predators, hunting programs can be used to reduce game wildlife populations to local carrying capacities. Refuge staff can provide hunting opportunities in a regulated manner, direct these activities to specific audiences, and adaptively evaluate the hunting programs based on demand and program success.

Strategies

1. Further define refuge management of the hunt program through the development of a hunting step-down management plan (to be completed within one year of CCP approval) so that new hunting opportunities can be incorporated into the visitor services step-down management plan (to be completed within three years of CCP approval).
2. Use the visitor services step-down management plan to revise hunt program zoning and scheduling—ensuring a design that minimizes disturbance of bird migrations.
3. Prepare DeSoto NWR's West Side Unit and additional Boyer Chute NWR units for managed hunts.
4. Prepare and submit all materials required to open or expand hunting on the refuges.
5. Partner with Iowa DNR and Nebraska Game and Parks Commission, National Wild Turkey Federation, Pheasants Forever, local sportsmen's clubs, and others to conduct managed hunts.
6. As additional land is acquired within the acquisition boundary at Boyer Chute NWR, reevaluate the areas that are available and safe for hunting with the long-term goal of opening additional areas to hunting.
7. Ensure that concerns over seasonal deer stand use on DeSoto NWR are addressed in the hunting step-down management plan.

Objective 3.2: Fishing

Both refuges: Over the life of the CCP, increase fishing opportunities over current conditions by opening new areas, promoting the fishing program, and through infrastructure improvements described in the associated strategies.

Rationale

Fishing is one of the six priority wildlife-dependent recreational uses identified in the National Wildlife Refuge System Improvement Act of 1997, and Service policy directs refuges to provide fishing opportunities when compatible. It is a goal of the Refuge System to provide the most appropriate and compatible, highest quality, and most sustainable wildlife-dependent recreation opportunities for the public. Fishing provides a traditional recreational activity on the refuges with no definable adverse impact to the biological integrity or habitat sustainability of the refuges' resources. Furthermore, fishing programs help promote an understanding and appreciation of natural resources and their management on lands and waters in the Refuge System. Fishing is also a way to engage visitors in activities related to water resources and water-associated habitats. The refuges enjoy a high degree of satisfaction with their fishing programs and plan to maintain this trend. The visitor survey conducted in 2010–2011 on DeSoto NWR indicated that 71 percent of anglers were either somewhat satisfied or very satisfied with the fishing opportunities on the refuge, and only 6 percent were unsatisfied (23 percent responded as indifferent) (Sexton et al. 2011).

Strategies

1. Increase fishing opportunities on both refuges, after CCP approval, by allowing bank fishing on the open waters of all refuge units that are open to the public (see figures 4-4 and 4-4).
2. Maintain two permanent boat launches on DeSoto Lake within 10 years of CCP approval. This includes the existing Middle Boat Ramp, and a new boat ramp and parking lot on the south end of DeSoto Lake (see figure 4-4).
3. Increase accessible fishing options on DeSoto Lake.
4. Continue to facilitate interagency partnerships that monitor and make management recommendations for the refuges' recreational fishing opportunities.
5. Investigate the potential benefits of closing the west arm of DeSoto Lake for the migration one month earlier (September 14 instead of October 14).

Objective 3.3: Wildlife Observation and Photography

Both refuges: Over the life of the CCP, increase wildlife observation and photography opportunities on both refuges over current conditions by opening new areas of the refuges allowing leashed dogs and improving infrastructure as described in the associated strategies.

Rationale

Wildlife observation and photography are priority wildlife-dependent recreation activities listed in the National Wildlife Refuge System Improvement Act of 1997. They are important and valuable activities that promote understanding and appreciation of natural resources and their management. If properly managed, these uses provide invaluable opportunities for interaction between people and the natural environment with little or no adverse effects to wildlife or habitat. By maintaining and developing trails, boardwalks, observation decks, and other infrastructure it is possible to enhance mobility and access to locations that offer premium wildlife viewing opportunities. The various modes of travel permitted on the refuge also help facilitate year round access to these opportunities and provide enjoyment of scenic views and a

diversity of wildlife not available on adjacent private lands. Allowing leashed dogs on open areas of the refuge will improve the wildlife viewing experience for some visitors. Disturbance created by leashed dogs on average is no greater than other pedestrian activities traditionally permitted on the refuge.

Strategies

1. Open additional areas to the public during the nonmigratory season at DeSoto NWR, including the East Dike South and on the West Side Units; and at Boyer Chute NWR including the Boyer Island, Horseshoe, Yellowlegs, Rail, Northwest, and Wildflower Units (see figure 3-2 for a map of management units).
2. Add a new trail near the DeSoto NWR Visitor Center, and a trail on the West Side Unit.
3. Offer wildlife observation opportunities at Nathan's Lake and improve parking and viewing capabilities on the Horseshoe Lake Unit of Boyer Chute NWR.
4. Develop a visitor services step-down management plan within three years of CCP approval.
5. Monitor and respond to needs for signage, orientation, information, and facilities.
6. Provide basic signage, orientation, information, and facilities in newly opened or acquired areas.
7. Continue to offer wildlife observation and photography opportunities for portable blinds in open areas.
8. Allow leashed dogs on open areas of the refuges.
9. Continue to allow biking on the refuges on all roads that are open to the public.
10. Monitor the bridge to the Boyer Island Unit, plan for its removal within the life of the CCP, and consider replacement options that will avoid the current maintenance needs, safety risks, and chute habitat disturbance.
11. Maintain free access to Boyer Chute NWR, and the existing fee structure for DeSoto NWR.

Objective 3.4: Environmental Education

Both refuges: Over the life of the CCP, maintain current environmental education programs in area schools (7,500 student visits per year) with a special emphasis on increasing interaction with inner city schools.

Rationale

Environmental education is a priority wildlife-dependent recreational use identified in the National Wildlife Refuge System Improvement Act of 1997. Well-designed environmental education programs can be effective management tools and provide the opportunity to influence visitor attitudes about natural resources, refuges, the Refuge System, and the Service. They can help develop public awareness, knowledge, attitudes, skills, motivation, and commitment to work cooperatively towards the conservation of our Nation's natural resources. They can also influence visitor behavior when visiting units of the Refuge System. Environmental education efforts for students span a broad diversity of science and natural resource topics, help connect

the Nation's youth with the natural world, and engage children in the outdoors. The educational partnership with the Blair Public School District (Nebraska) is nationally recognized, bringing thousands of onsite student visits annually. Future growth in formal educational student visits will be targeted at Omaha–Council Bluffs inner city schools located approximately 30 miles south of the refuges.

Current environmental education programs and activities include:

- Staff-conducted formal environmental educational school programs
- Self-guided school educational, with pre-visit and post-visit materials
- Friends Group educational bookstore in the DeSoto NWR Visitor Center

Strategies

1. Continue coordinating existing environmental education program partnership with local schools in Blair, Edison, and Fort Calhoun Schools (Nebraska), and West Harrison Schools (Iowa).
2. Work with local educators, refuge environmental education staff, and others to increase inner city education efforts by identifying new inner city education audiences and topics for environmental education programs.
3. Continue to encourage self-directed learning on the refuge in addition to providing programs, activities, talks, publications, audio-visual media, signs, and exhibits.
4. Continue to serve as a local resource for environmental education related to area wildlife, habitats, water resources, and cultural history by providing curricula, workshops, outdoor classrooms, and teaching materials.
5. Because DeSoto NWR's Steamboat Bertrand Museum Collection offers a one-of-a-kind cultural history education resource, the refuges will continue to offer formal cultural history programs and resources highlighting cultural history aspects of environmental education.
6. Continue to work with local educators to develop environmental education curricula and conduct workshops.
7. Develop operational measures of success for the environmental education program.

Objective 3.5: Interpretation

Both refuges: Over the life of the CCP, improve interpretive facilities and services as described in the associated strategies to increase visitor appreciation and understanding of the refuge purposes and FWS mission.

Rationale

Interpretation is a priority wildlife-dependent recreational use identified in the National Wildlife Refuge System Improvement Act of 1997. Well-designed interpretation programs can provide the opportunity to influence visitor attitudes about natural resources, refuges, the Refuge System, and the Service. They can help develop public awareness, knowledge, attitudes, skills, motivation, and commitment to work cooperatively towards the conservation of our Nation's

natural resources. They can also influence visitor behavior when visiting units of the Refuge System.

Current interpretation programs and activities include:

- Junior Refuge Manager program
- Winter backyard bird feeding programs
- Wildlife observation walks and talks
- Wilson Island campfire talks
- Refuge-specific interpretive brochures and publications
- Wildlife and refuge orientation videos shown in the DeSoto NWR Visitor Center
- Wildlife observation stations with viewing scopes
- Family fishing clinics
- Interpretive wayside and kiosk panels
- Visitor Center exhibits
- Refuge website and Facebook pages

Strategies

1. Within the life of the CCP, as needed create new exhibit panels at DeSoto NWR's main entrance, wetland viewing platforms, trails, Missouri River Overlook, Steamboat Bertrand Discovery Site, boat launch sites, and at new areas opened to the public at both refuges.
2. Increase information at viewing platforms within three years, introducing a wider range of interpretive media over the life of the CCP; and update interpretive products to better reflect biological topics.
3. Within three years of CCP approval, develop a visitor services plan that identifies target audiences, establishes interpretive themes, and identifies the best tools and techniques to strategically apply interpretive programs and products.

Objective 3.6: Welcoming and Orientation

Both refuges: Within 5 years of plan approval, improve welcoming, orienting, and associated information and infrastructure as described in the associated strategies.

Rationale

Successfully welcoming and orienting refuge visitors is an important part of the development of a quality wildlife-dependent recreation program as identified in the National Wildlife Refuge System Improvement Act of 1997 and defined in the Service Manual (605 FW 1). The ease with which the public can navigate to visitor use areas on the refuges, understand guidelines for appropriate conduct and safety, meet basic needs (i.e., parking, restrooms, orientation, etc.), and fully engage in wildlife-related activities directly translates to a quality recreational experience, a positive impression of the Service, and an identification with the mission and goals of the Service.

On DeSoto NWR, the quantity of visitor services and resulting visitation have been sustained at high levels since the establishment of the refuge in 1958—and were further enhanced by the construction of the Visitor Center and Steamboat Bertrand Museum Collection display in 1981. DeSoto NWR is a destination for visitors, attracting a mix of individuals with wildlife-dependent recreation interests as well as interest in the refuge’s historical and cultural history. Adequate way-finding, orientation, signage, and other refuge information continues to be essential to directing people to the refuge and providing a positive visitor experience across the broad spectrum of public uses.

Information, orientation, and signage needs are even greater at Boyer Chute NWR, which does not maintain a daily staff presence. Proper signage and other welcoming and orienting materials can reduce the need for direct interaction with refuge staff and allows a greater amount of self-guided use.

Strategies

1. Complete a visitor services step-down management plan within three years of CCP approval to further evaluate and define refuge welcoming and orientation needs.
2. Establish a sign replacement plan, which will be revised/updated every three years during the life of the CCP.
3. Update existing kiosk and wayside information and orientation exhibits according to the sign plan priorities at both refuges.
4. Create new exhibit panels, within the life of the CCP, at DeSoto NWR main entrance, wetland viewing platforms, trails, Missouri River Overlook, Steamboat Bertrand Discovery Site, boat launch sites, and at new areas opened to the public at both refuges.
5. Work with the regional Departments of Transportation, within 10 years of CCP approval, to establish way-finding signage on U.S. 30 in Missouri Valley, Nebraska and Blair, Iowa; and on I-29 and I-80 in Council Bluffs, Iowa and Omaha, Nebraska.
6. Inspect refuge signs annually, updating and rehabilitating where necessary.
7. Maintain and update visitor service information provided by social media, brochures, and refuge websites over the life of the CCP.

Objective 3.7: Outreach

Over the life of the CCP, maintain current levels of media engagement and the current annual number of onsite small events (10) and offsite events (nine) with review and revision as necessary at five-year intervals.

Rationale

The Service’s “National Outreach Strategy” (FWS 1997a) defines outreach as a two-way communication between the Service and the public to establish mutual understanding, promote involvement, and influence attitudes and actions, with the goal of improving joint stewardship of our natural resources.

It is critical to the mission of the Refuge System and to DeSoto and Boyer Chute Refuges that neighbors, citizens, organizations, and agencies in the surrounding area know about the refuges and support them as valuable, contributing assets to area communities. Continued support is essential for the success of the refuges and their long-term viability. Developing relationships with other conservation agencies and organizations is of mutual benefit in meeting broader natural resource goals and objectives. Also, building support for land and water conservation among refuge neighbors is essential to the protection of natural resources over the long-term. It is important that the refuges continue efforts to build and maintain open lines of communication, informing partners and the public about the successes, opportunities, and challenges of conservation and wildlife-dependent recreation.

Current activities include:

Onsite

National Public Lands Day
Spring Earth Day Cleanup
Boyer Butterfly Count
Family Fishing Clinics (5)
Spring Migration Weekend
National Wildlife Refuge Week
Fall Migration Weekend
Art-In-The Wild
Bertrand Days
Teachers Workshop
Junior Refuge Manager (6)

Offsite

Nebraska Fishing Clinic
Family Nature Nights (4)
Party for the Planet
Gifford Farm Park
Durham Teachers Workshop
Omaha Public Schools Career Day
Nebraska Science Festival
Wilson Island Campfire Talks (12)

Strategies

1. Evaluate visitor feedback and participation in annual onsite and offsite refuge events and programs for continuity, relevance, and changes.
2. Complete a visitor services step-down management plan within three years of CCP approval to further evaluate and define refuge events and outreach efforts.
3. Continue to interact with public media outlets to promote and report refuge programs activities, accomplishments, and management.
4. Continue to develop periodic news articles and radio/TV programs on refuge-related topics.
5. Maintain active communication with community leaders, schools, agencies, and partner organizations.
6. Continue to develop good relations with landowners in, and immediately adjacent to refuge authorized boundaries.
7. Work cooperatively with local universities, colleges, and other organizations and agencies to promote research on the refuges.
8. Continue to use the refuge website and social media to communicate with off-site audiences.

Objective 3.8: Gathering

Both refuges: After CCP approval, allow mushroom gathering in all areas and seasons that are open to the public.

Rationale

Access for gathering is not a wildlife-dependent recreational use of the Refuge System. Refuge resources can support this activity, which can also provide enjoyment of scenic views and a diversity of wildlife not usually available on adjacent private lands. Access for gathering is a high priority for many refuge visitors. In addition, consistency in the management of public use across both refuges will ease visitor understanding and management considerations related to this use.

Strategies

1. Monitor impacts to new areas open to mushroom gathering.
2. Provide updated visitor use information related to mushroom gathering through the refuge website, brochures, and other media.

Objective 3.9: Steamboat Bertrand Museum Collection and Discovery Site

Continue stewardship and display of the Steamboat Bertrand Museum Collection over the life of the CCP and improve interpretation of the Steamboat Bertrand Discovery Site for visitors by developing a new site interpretation proposal within 5 years of CCP approval.

Rationale

DeSoto NWR's Steamboat Bertrand Museum Collection and Discovery Site connect visitors to an important story in our national heritage, and constitute an invaluable and irreplaceable national treasure. Relaying the entire story of the Steamboat Bertrand—its construction, use, loss, rediscovery, excavation, preservation, and eventual display—highlights the importance of safeguarding historic sites and protecting these antiquities from degradation, looting, and other adverse impacts. It also tells the story of how the Missouri River once migrated freely across the floodplain, continually altering habitats along its course. Stewardship of the collection is derived from numerous laws, including the National Historic Preservation Act of 1966 as amended (16 U.S.C.470 et seq.) and the Archeological Resources Protection Act of 1979 as amended (16 U.S.C. 47011-mm).

Strategies

1. Develop and implement new interpretation around the Steamboat Bertrand Museum Collection and Discovery Site in coordination with the Nebraska State Historic Preservation Officer and Service Regional Historic Preservation Officer to ensure compliance with Section 106 of the National Historic Preservation Act of 1966, ARPA, and NAGPRA.

2. Ensure that the design and planning of the Steamboat Bertrand Museum Collection storage and interpretation includes updated considerations for disaster mitigation and evacuation procedures.
3. Ensure archaeological and cultural resources at the Steamboat Bertrand Discovery Site are better identified, interpreted, and accessible to the public.
4. Remove the existing overlook at the Steamboat Bertrand Discovery Site, and build a new interpretive kiosk within two years of CCP approval.
5. Ensure the Steamboat Bertrand Discovery Site story is connected to the resources displayed and interpreted at the Visitor Center.
6. Complete and maintain a comprehensive inventory of the Steamboat Bertrand Museum Collection.

Objective 3.10: Refuge Support

Both refuges: Over the life of the CCP, maintain an average of at least 3,500 annual volunteer hours and existing levels of support for the refuges from the Friends Group, law enforcement partnerships with local police departments and state game officers, partner agencies, and non-government organizations.

Rationale

The human resource hours required to effectively manage a refuge often exceed that which can be provided by staff alone. The accomplishments of any refuge, especially the exemplary work above and beyond the day-to-day management needs, are often the result of joint public and private teamwork and the collective interests and enthusiasm of the multitude of individuals that benefit from the refuge. As public servants, Service staff manage a public resource owned by the citizens of this Nation. The greater the involvement of the public, the more successfully the mission of the Service is met, “working with others . . . for the continuing benefit of the American people.”

The volunteer program over the past ten years for both refuges (combined) has averaged over 300 individuals each year that have helped with refuge awareness, wildlife surveys, DeSoto NWRs Eagle Emporium bookstore, general maintenance, environmental education, seed collecting, and fundraising activities.

As an extension of refuge volunteerism, a refuge Friends Group is a grassroots organization formed by citizens who have a shared desire and vision to support their local refuge. They join with Service personnel in a partnership that seeks to accomplish mutually defined goals. Maintaining a Friends Group helps build a constituency of support for the refuges, provides people with opportunities to assist in the accomplishment of the FWS mission, and enhances refuge performance through the creativity, innovations, labor, and expertise contributed by its members.

Strategies:

1. Fill existing (five) vacancies in the staffing chart for the refuges with the associated priority order (highest to lowest): wildlife biologist, maintenance, administrative assistant, maintenance, and park ranger.

2. Actively recruit new volunteers in areas within, and adjacent to, the refuges authorized boundaries, and throughout the Omaha–Council Bluffs Metropolitan Area.
3. Partner with the Friends Group to provide six onsite and offsite events as opportunities to recruit new volunteers and promote the Friends Group.
4. Work with volunteer organizations and area service groups to increase volunteerism at the refuges.
5. Support the refuge Friends Group in refuge education and resource management.
6. Work cooperatively with local universities, colleges, and other agencies to promote research on the refuges.