

3—Alternatives

This chapter describes the management alternatives for the Charles M. Russell and UL Bend National Wildlife Refuges. Alternatives are different approaches to management designed to achieve the refuge purposes, vision, and goals; the mission of the Refuge System; and the mission of the Fish and Wildlife Service. Alternatives are formulated to address significant issues, concerns, and problems identified by the Service, cooperating agencies, interested groups, tribal governments, and the public during public scoping and throughout the development of the draft plan. Chapter 1 contains descriptions of these issues.



Draft alternatives were presented to the public in the fall of 2008.

USFWS

3.1 Criteria for Alternatives Development

Following the initial scoping process in fall 2007 and early 2008, the Service held meetings and workshops with the cooperating agencies and the public and identified a reasonable range of preliminary alternatives. Some ideas were eventually eliminated, and those are discussed under section 3.10—Elements Considered but Eliminated from Further Consideration. The Service carried forward the following four alternatives and analyzed them in detail in this EIS:

- Alternative A—No Action
- Alternative B—Wildlife Population Emphasis
- Alternative C—Public Use and Economic Use Emphasis
- Alternative D—Ecological Processes Emphasis (Proposed Action)

These alternatives examine different ways for providing permanent protection and restoration of fish, wildlife, plants, habitats, and other resources and for providing opportunities for the public to engage in compatible wildlife-dependent recreation. Each alternative incorporates specific actions intended to achieve the goals described in chapter 2. However, the no-action alternative A represents the current, unchanged refuge management and may not meet

every aspect of every goal. The no-action alternative provides a basis for comparison of the action alternatives B, C, and D.

3.2 Elements Common to all Alternatives

Key elements of refuge management will be included in the final CCP regardless of the alternative selected. For example, the Service will comply with all applicable laws, regulations, and policies for management activities that could affect refuge resources such as soil, water, air, threatened and endangered species, and archaeological and historical resources. These activities include subsurface mineral reservations and management of utility lines, easements, contaminants, and invasive species. A list of key legislation and policies that the Service adheres to is in Appendix D—Key Legislation and Policy. Specific elements common to alternatives follow:

- Significant cultural and paleontological resources will be protected and managed. Individual projects may require additional consultation with the State of Montana's Historic Preservation Office, Tribal Historic Preservation Offices, and other interested parties.
- A number of special regulations for public access on the refuge will continue to apply. Many of these are identified at the beginning of the access discus-

sion under Public Use and Education in section 3.8. The Service will continue to allow for access to private inholdings or State lands. Although the amount or type of access would vary by alternative, the Service will develop a step-down management plan for transportation based on the alternative selected for the final CCP.

- The Service will continue to collect grazing fees in accordance with the region 6 grazing policy.
- The Service will collaborate with USACE in accordance with established agreements. As an example, operation of the Fort Peck Interpretive Center and Museum is a cooperative effort between USACE, the Service, and Fort Peck Paleontology Incorporated.
- The UL Bend Wilderness and all proposed wilderness will be protected in accordance with the 1964 Wilderness Act and the Service's Wilderness Stewardship Policy (FWS 2008d).
- All wildfire suppression and prescribed fire activities will be carried out under an approved fire management plan.
- The Service will carry out actions in the CCP through cooperation and collaboration with Federal, State, tribal, and local governments; nongovernmental organizations; and adjacent private landowners. Section 3.11 describes existing and potential partnerships.
- Through a reciprocal agreement between the Service and DNRC, the Service would aggressively suppress all wildfires that occur on State school-section lands within the boundary of the refuge. The Service would continue to issue special use permits for grazing on the State school sections that recognize those AUMs allotted.
- The control of invasive weeds and integrated pest management will be done using a variety of tools such as biological and mechanical controls, grazing, and herbicides. The Service will continue to update invasive species mapping, use the Service's weed strike team, and work in partnership with others to reduce weed infestations.
- Artesian wells will be capped to prevent depletion of groundwater.
- Several refuge permittees have grazing permits that include Service lands, BLM, and DNRC lands. The implementation of prescriptive grazing on Service lands may impact the ability of permittees to continue to graze DNRC lands within the refuge boundary. It is not the intent of the Service to impact the DNRC's ability to meet their obligation of generating revenue for local schools. The Service will work with local DNRC land managers to allow permittees continued access for grazing DNRC lands. If current permittees of DNRC lands do not want to retain their permits, the Ser-

vice will work within current budget constraints to obtain leases that benefit refuge management activities.

- The Service would cooperate with partners to provide comparable accessible opportunities for all.

3.3 Structure of Alternative Descriptions

Each alternative is designed to clearly address the goals described in chapter 2; therefore, the alternatives are organized by the following goal headings:

- Habitat and Wildlife Management
- Threatened and Endangered Species and Species of Concern
- Research and Science
- Fire Management
- Public Use and Education
- Wilderness
- Cultural and Paleontological Resources
- Refuge Operations and Partnerships

Sections 3.4–3.7 summarize alternatives A–D, respectively, that the Service developed to achieve the refuge vision and goals and to address the significant issues. There is a no-action, or current management, alternative (A) and three action alternatives (B–D). The Service has identified alternative D as the proposed action. These alternative summaries describe the overall focus of each alternative along with its key management elements. In addition, there is a map of each alternative showing management elements that could be visually represented.

To easily compare the alternatives by topic, section 3.8 contains the detailed actions by which the goals would be achieved. Each goal title is followed by the related objectives for each of the four alternatives. The timeframe to accomplish each objective refers to the number of years after the Service approves the final CCP. Detailed rationale explains how and why each objective would help meet the goal under the specific emphasis of the associated alternative. Additionally, there are strategies listed for achieving each objective. Comparing the objectives and strategies by goal, instead of separating out the topics by alternative, makes it easier to compare the differences between specific objectives without having to flip back through numerous pages. Table 7 in section 3.15 at the end of this chapter is a summary of the actions for each alternative. Table 56 at the end of chapter 5 summarizes the consequences of these actions.

3.4 Summary of Alternative A (No Action)

Few changes would occur in managing existing wildlife populations and habitat. Wildlife-dependent public and economic uses would continue at current levels. Figure 7 depicts the management of resources and public use for alternative A.

HABITAT and WILDLIFE MANAGEMENT, THREATENED and ENDANGERED SPECIES and SPECIES of CONCERN, RESEARCH and SCIENCE, and FIRE MANAGEMENT

Goals for the topics above are intricately linked in managing habitat, wildlife, and water resources. The elements below reflect these relationships for alternative A.

Habitat

There would be a continued emphasis on big game management, annual livestock grazing, use of fencing for pastures, and invasive species control. Habitats would continue to be managed in the 65 habitat units that were established by BLM for grazing purposes, and residual cover on these units would be measured. Some small bottomland or riparian area restoration projects would occur. Monitoring of habitat would continue at existing levels: (1) residual cover; and (2) sentinel plants (plant species that vanish first when natural ecological processes are out of balance) in areas throughout the refuge.

Livestock Grazing. Livestock would be kept out of most riparian areas with fencing. There would be a gradual move to prescriptive grazing only when units became available or habitat evaluations are completed and when prescriptive grazing is identified as necessary to meet wildlife or habitat objectives.

Wildfire. The current habitat management regime would be maintained mostly through a wildfire suppression program with little use of prescribed fire.

Invasive Species. The existing control programs for invasive species would continue. Actions include mapping; using biological controls, chemical spraying, and weed wash stations; and requiring horse users to use weed-seed-free hay.

Climate Change. Following Service policy and guidelines on climate change initiatives, the Service would carry out the following actions: (1) maintain a wind turbine; (2) continue recycling; (3) increase energy efficiency and adopt other ways to reduce the carbon

footprint; and (4) consider what conditions precipitated by climate change the refuge may deal with such as increased drought, longer fire seasons, hotter fires, loss or increase of plant and wildlife species, change in migration patterns, and relocation of species.

Water Resources

Select stock ponds would be maintained and rehabilitated. Riparian habitat would be restored where possible and standard watershed management practices would be enforced. Water rights would be adjudicated and defined.

Wildlife

Inventory and monitoring of wildlife would continue at existing levels: (1) wildlife surveys of Rocky Mountain elk, mule deer, Rocky Mountain bighorn sheep, black-footed ferret, and raptors; (2) lek locations for grouse; (3) black-tailed prairie dog mapping; and (4) mourning dove counts.

Big game would be managed to achieve target levels in the 1986 EIS record of decision: and 2.5 elk per square mile, 10 mule deer per square mile, and 160 bighorn sheep. This includes a more restrictive rifle season for mule deer in some State hunting districts as compared to the State season.

Predator control coordinated by the U.S. Department of Agriculture (Wildlife Services) would occur on a limited basis, but mountain lion hunting and predator hunting or trapping would not be allowed. Limited coyote hunting would be allowed from mid-October through March 1.

Threatened and Endangered Species and Species of Concern

The black-footed ferret recovery effort would continue including releasing animals, intensive monitoring, and disease and habitat management.

PUBLIC USE and EDUCATION

The Service would continue managing public uses to provide for a variety of wildlife-dependent opportunities and programs.

Hunting

Hunting programs would continue for wild ungulates (elk, deer, and pronghorn), upland birds, waterfowl, and coyote (limited hunting). Shooting of nongame species, trapping, and shed-antler hunting would all be prohibited. All other wildlife would be protected. The Service would cooperate with USACE on providing deer hunting opportunities for persons with disabilities. Facilities such as the accessible hunting blind would be maintained or upgraded.

Fishing

State regulations would apply. The Service would continue to allow fishing to be regulated by MFWP.

Wildlife Observation, Photography, Interpretation, Environmental Education, and Outreach

Limited programs would be offered and include the educational bus tour, school visits, and refuge personnel at the fair booth. Facilities such as the auto tour route, elk-viewing area, and other kiosks would be maintained. Seasonal refuge personnel would staff the interpretive center at Fort Peck Field Station.

Access

About 670 miles of road and trails would remain open with limited, seasonal closure of some roads when necessary. The following activities would be allowed: all-terrain vehicle use on public roads providing they are licensed, biking on numbered roads including seasonally closed roads, horseback riding, and public planes that could land only on water or ice as determined by USACE and the refuge's aircraft landing plan. Camping would be allowed throughout the refuge, and vehicle access would be allowed to campsites within 100 yards of a road.

Recreation Sites

The Service would work with USACE on management of boat ramps (about nine ramps have access to water).

Commercial Recreation

Eleven outfitting permits would continue to be offered for hunting, and unregulated commercial fishing and guided fishing would continue to be allowed. Commercial outfitting for coyote hunting would be prohibited. [Note: USACE has primary jurisdiction over Fort Peck Lake and is the lead agency in managing commercial activities on the lake and other USACE-managed lands.]

WILDERNESS

The Service would continue to manage the 20,819-acre UL Bend Wilderness (see figure 7) in the UL Bend refuge as a class 1 air shed. About 155,288 acres of proposed wilderness within 15 units of the Charles M. Russell refuge (see figure 7) would be managed in accordance with Service policy. Roads in proposed wilderness units would remain closed except for roads that provide access to private lands within the refuge. Within 2 years, the Service would finalize the study of all units that meet the wilderness criteria (refer to Appendix E—Wilderness Review and Summary) and submit final recommendations to the Service directorate and Secretary of the Department of the Interior. The study would include an evaluation of the appropriateness of all minimum tools, including hand carts, for use in wilderness.

CULTURAL and PALEONTOLOGICAL RESOURCES

Cultural resources are sites, buildings, structures, and objects that are the result of human activities and that are more than 50 years old. They include prehistoric, historic, and architectural sites; artifacts; historical records; and traditional cultural properties including traditional use areas for Native Americans that may or may not have material evidence. Paleontological resources include fossils of both animals and plants.

Cultural Resources

Cultural resources would be identified, and significant resources would be protected in accordance with the National Historic Preservation Act and other relevant laws. Some old homesteads would continue to be maintained, but others would not. Known gravesites would be protected and the cultural resource inventory would be maintained. The Service would maintain closures of roads through sensitive areas. A refuge history brochure would be provided.

Paleontological Resources

The Service would continue to issue permits to institutions that investigate paleontological resources from a scientific perspective. Permits would not be issued for recreational paleontology requests that do not follow a scientific study design. All permits would continue to meet compatibility requirements and the regulations for the Paleontology Resource Protection Act.

REFUGE OPERATIONS and PARTNERSHIPS

The vision and goals would be met through commensurate refuge operations and the refuge's collaboration with many partners.

Refuge Operations

The refuge relies on personnel, equipment, and facilities to carry out both the day-to-day operations along with the long-term programs.

Personnel. Personnel would be maintained at current levels.

Equipment and Facilities. Equipment and facilities would be maintained a current levels. (Same as B.)

Land Acquisition. The Service would cooperate with USACE to transfer jurisdiction of lands not needed by USACE to meet its legal mandates.

Minerals. Mineral withdrawal on all refuge land would continue, and the Service would work to renew these withdrawals. The Service would adhere to legal obligations for rights-of-way, including those

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for oil and gas extraction, for access to private and State lands.

Partnerships and Collaboration

The Service would maintain existing partnerships with Federal and State agencies, counties, conservation districts, adjacent private landowners, local communities, and others.

3.5 Summary of Alternative B (Wildlife Population Emphasis)

The Service would manage the landscape, in cooperation with our partners, to emphasize the abundance of wildlife populations using (1) balanced natural ecological processes such as fire and herbivory (grazing and browsing) by wild ungulates, and (2) responsible synthetic methods such as farming practices or tree planting. Wildlife-dependent public uses would be encouraged, and economic uses would be limited when they compete for habitat resources. Figure 8 depicts the management of resources and public use for alternative B.

HABITAT and WILDLIFE MANAGEMENT, THREATENED and ENDANGERED SPECIES and SPECIES of CONCERN, RESEARCH and SCIENCE, and FIRE MANAGEMENT

Goals for the topics above are intricately linked in managing habitat, wildlife, and water resources. The elements below reflect these relationships for alternative B.

Habitat

The Service would actively manage and manipulate habitat, thus creating a diverse plant community of highly productive wildlife food and cover plants. The management emphasis would be on habitat for specific target species of wildlife in separate parts of the refuge, largely based on the species recommendations in Olaus Murie's 1935 biological assessment. Murie talked about the refuge's habitat potential to support a variety of wildlife species such as elk, bighorn sheep, and bison to name a few. The Service would consolidate the 65 habitat units; subsequently, the refuge staff would write new HMPs based on field station boundaries and habitat evaluation and management for each target species. The Service would work with others to develop methods to monitor and evaluate target species and habitat needs.

Desired habitat conditions may be created using natural ecological processes (such as fire, grazing by

wildlife, or flooding) or through management practices (such as agricultural plantings and managed fire). For example, the dense understory of juniper, ponderosa pine, and Douglas-fir in forested coulees (ravines) could be thinned, which would lessen the likelihood of wildfire moving into the overstory and possibly eliminating mature forest stands.

An aggressive approach to reduction of invasive plants in the river bottoms would be based on priorities. Work would include using prescribed fire, spraying with herbicides, and planting wildlife food crops to clear invasive plants. In addition, the Service would collaborate with others to combat invasive plants in shoreline habitat. Mechanical means could be used to improve shoreline habitat for fish, birds, or other wildlife. Where feasible and combined with research, the Service would restore the functioning condition of riparian areas and preserve fire refugia (places where fire rarely burns).

Livestock Grazing. The Service would carry out a prescriptive grazing regime—designating the use of livestock grazing with written directions to achieve specific desired outcomes—across most of the refuge. Within 4–7 years, a prescriptive livestock-grazing plan would be developed for 50–75 percent of the refuge. Interior fencing would be removed if necessary. The refuge boundary would be fenced to exclude common pastures and allow the Service to conduct management treatments for achieving the habitat objectives. The use of exclosures and prescriptive grazing would be increased where needed to exclude livestock from river bottoms or other riparian areas with the exception of developed water gaps if determined to be appropriate and compatible with habitat management objectives.

Wildfire. The Service would increase the use of prescribed fire—any fire ignited by management actions to meet specific objectives. Increased monitoring would be used to measure and understand the implications of prescriptive livestock grazing and prescribed fire.

The Service would work with USACE and other partners to address the wildland-urban interface at the Pines Recreation Area and other USACE recreation areas. Wildfire would be used to protect, maintain, and enhance resources and, where possible, be allowed to function in its natural ecological role.

Invasive Species. There would be an increased effort to reduce invasive plants by converting former croplands that are now infested with invasive plants (more than 3,000 acres) to food plots for wildlife. The Service would emphasize visitor awareness about invasive plants and invasive aquatic wildlife, such as the zebra mussel, through education along with increasing the weed-seed-free requirements for out-

fitters or permittees and increasing enforcement if necessary.

Climate Change. Based on climate change predictions and following Service and departmental policies and initiatives, the Service would identify (1) species of plants that are likely to be first to decline, (2) animals that are associated with these plant species including insects, birds, and mammals, and (3) species of plants and animals that could increase. Additionally, the Service would design science-based, long-term monitoring protocols to document changes in plant and animal composition or health due to climate change. The Service would coordinate with adjoining agencies and partners to immediately alleviate declines, if needed, using tools such as prescriptive grazing, prescribed fire, or flooding. The Service would cooperate on national and international projects to maintain biological diversity, integrity, and environmental health on a global basis.

In addition to the climate change elements in alternative A, the Service would do the following: (1) replace all vehicles with more fuel-efficient vehicles; (2) upgrade offices to “green” standards; (3) consider installing solar panels or small wind turbines for offices and field stations; (4) provide more recycling bins; (5) encourage more teleconferencing instead of meetings; (6) encourage staff to be more energy efficient (such as turning off lights, recycling, and turning down heat); and (7) study and promote the carbon sequestration benefits of the refuge.

(Same as C and D.)

Water Resources

In addition to the water resources elements in alternative A, the Service would work to restore water quality for fish and wildlife habitats and populations by addressing soil erosion from overgrazing, roads, or other sources (such as contamination from recreational or economic uses including human use of camping areas or excessive livestock use of streams). There would be efforts to retain ground cover throughout the refuge to increase groundwater flow into streams and to reduce runoff and soil erosion, thus protecting riparian corridors.

The Service would acquire water rights associated with the purchase of inholdings and would obtain senior upstream water rights only when approached by a landowner or current water-right holder.

Wildlife

Through cooperation and collaboration with MFWP and adjoining landowners, the Service would use wildlife- and habitat-based objectives and strategies that consider natural densities, social structures, and population dynamics at the landscape level. The Service and these cooperators would mutually agree on population levels that can be tolerated by adjoining

landowners and provide for quality recreational experiences without negatively affecting habitat or other wildlife species. The Service would collaborate with others to manage wildlife to benefit all species in and around the refuge. Actions would include using hunting to improve habitat, developing conservation easements, or other incentives to benefit species diversity and ecological integrity.

Reintroductions. The Service would identify habitat suitable for Rocky Mountain bighorn sheep and establish new populations based on modeling and MFWP transplant criteria. The Service would seek to restore and increase native fish populations in the Missouri River and its tributaries and in artificially developed impoundments (existing or new).

Threatened and Endangered Species and Species of Concern

The Service would protect or enhance populations of threatened and endangered species such as the black-footed ferret, nongame species such as the black-tailed prairie dog, and bird species or other species of management concern through research, disease management, population augmentation, or habitat manipulation.

The Service would develop management plans for the gray wolf and for the grizzly bear, in accordance with Federal and State regulations and plans to address potential immigration of these species to the refuge. With approved MFWP management plans and in cooperation with MFWP and others, the Service would consider reintroduction of additional black-footed ferrets, swift foxes, black-tailed prairie dogs, pallid sturgeons, and bighorn sheep into the landscape. Predators would be managed as an important component of the wildlife community, and predator management by the U.S. Department of Agriculture would be eliminated.

PUBLIC USE and EDUCATION

In addition to the elements for public use and education in alternative A, the Service would encourage the wildlife-dependent opportunities and elements described below. The Service would not allow new secondary recreational uses unless they facilitate one of the wildlife-dependent recreational uses.

Hunting

The Service would work with others to provide opportunities for quality hunting as a management tool that maintains both sustainable populations of big game and improves habitat for nongame species.

Fishing

The Service would work with others to provide opportunities for quality fishing that maintain both sustainable populations of game and nongame fish.

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Wildlife Observation, Photography, Interpretation, Environmental Education, and Outreach

Environmental education and interpretation programs would be created based on wildlife biology and habitat requirements. The Service would work with additional partners to expand interpretive and educational opportunities and update the signage, website, and other interpretive media and facilities as needed. More opportunities would be provided for persons with disabilities where needed. The Service would collaborate with others to develop a science center at Sand Creek Field Station.

Access

The Service would manage access to benefit and increase wildlife populations and promote harvest opportunities. The Service would close about 106 miles of road and some access. The Service would work with partners (Federal and State agencies, counties, and others) to develop a travel plan and secure access to the refuge through other lands. Nonmotorized access would be promoted, but the Service would consider allowing motorized access on existing roads only for game retrieval and restricting access on a seasonal basis to sensitive areas by river and road. All-terrain vehicle use would be monitored on numbered trails and managed if there was documented disturbance of wildlife or visitors. The Service would monitor boat use and determine if disturbance is an issue, and then the Service would work with cooperators and users to identify solutions for limiting disturbance to wildlife along the river corridor.

Recreation Sites

Vehicular camping would be managed to fit the associated use, for example, paddlefish fishing lends itself to concentrated camping versus big game hunting and dispersed camping. Backcountry camping would be permitted. The Service would ensure that camping does not severely affect surrounding habitat.

Commercial Recreation

The Service would collaborate with USACE to permit commercial fishing operations, including fishing tournaments, through USACE's permit process. Additional commercial backcountry-outfitting permits would be developed for hunting to accomplish habitat and wildlife objectives.

WILDERNESS

In addition to the wilderness elements in alternative A, the Service would evaluate the proposed wilderness units to determine if they still meet the wilderness criteria identified in the Wilderness Act and Service policy. The Service would make recommendations on any modifications including additions or deletions for Ser-

vice, Department, and congressional approval. The Service would potentially increase the amount of proposed wilderness by about 25,037 acres to enhance management capabilities and habitat manipulation.

CULTURAL and PALEONTOLOGICAL RESOURCES

Cultural resources and paleontological resources would be protected as identified in alternative A.

Cultural Resources

In addition to the protection elements in alternative A, the Service would create a sensitivity model for cultural resource locations and conduct surveys in areas with a moderate or high potential for resources. A comprehensive cultural resource overview and step-down plan would be completed. Oral histories would be collected to help understand and interpret the history of some of the structures on the refuge. Opportunities to work with partners to fund and implement preservation projects would be explored, and any artifact collections would be located and properly curated. There would be increased protection of cultural and paleontological sites through law enforcement and public education.

(Same as D.)

Paleontological Resources

For paleontological resources, elements would be similar to alternative A, except the refuge would develop a step-down plan with Montana State University and USACE for these resources. The number of education permits for universities for excavation of paleontological resources could be decreased if necessary to increase protection.

REFUGE OPERATIONS and PARTNERSHIPS

The vision and goals would be met through commensurate refuge operations and the refuge's collaboration with many partners.

Refuge Operations

The refuge relies on personnel, equipment, and facilities to carry out both the day-to-day operations along with the long-term programs.

Personnel. In addition to elements in alternative A, the Service would increase staff to include an outdoor recreation planner, an additional full-time law enforcement officer, and a fire technician at the Fort Peck Field Station.

Equipment and Facilities. Same as A.

Land Acquisition. In addition to elements in alternative A, the Service would acquire inholdings from willing sellers and facilitate the exchange of State lands within the refuge boundary where feasible.

(Same as C.)

Minerals. In addition to elements in alternative A, the Service would seek permanent withdrawal of all minerals, including oil and gas and other leasable and saleable minerals on all refuge lands and future acquisitions.

Partnerships and Collaboration

In addition to partnerships and collaboration elements in alternative A, the Service would review the refuge's partnerships and adapt them as needed based on new management direction. Staff would coordinate with USACE on lands that could be transferred to the Service for primary jurisdiction. The Service would continue to explore opportunities to collaborate with partners on wildfire suppression, use of prescribed fire, and habitat manipulation. Staff would seek additional partnerships and funding to support endeavors such as increased control of invasive species or for initiation of a friends group. For a full list of existing and potential partners, refer to section 3.11–Partnerships.

Land exchange with the State, BLM, private landowners, or nongovernmental organizations would be explored when exchange opportunities became available.

(Same as C.)

3.6 Summary of Alternative C (Public Use and Economic Use Emphasis)

The Service would manage the landscape, in cooperation with our partners, to emphasize and promote the maximum, compatible, wildlife-dependent public uses and economic uses while protecting wildlife populations and habitats to the extent possible. Damaging effects on wildlife habitats would be minimized while using a variety of management tools to enhance and diversify public and economic opportunities. Figure 9 depicts the management of resources and public use for alternative C.

HABITAT and WILDLIFE MANAGEMENT, THREATENED and ENDANGERED SPECIES and SPECIES of CONCERN, RESEARCH and SCIENCE, and FIRE MANAGEMENT

Goals for the topics above are intricately linked in managing habitat, wildlife, and water resources. The elements below reflect these relationships for alternative C.

Habitat

In addition to the habitat elements in alternative A, the Service would generally manage habitats to provide more opportunities for wildlife-dependent recreation. In places, the refuge staff would manage for plant communities that could necessitate a compromise between providing wildlife food and cover and livestock forage needs. Where needed, fencing and water gaps would be used to manage livestock use and prevent further degradation of riparian habitat. Camping areas would be managed to limit expansion and further degradation of riparian habitat. Similar to alternative A, the Service would monitor residual cover to measure forage availability.

Livestock Grazing. The Service would gradually move to a prescriptive livestock-grazing program when current grazing permits become available due to a ranch changing ownership (this would not include generational transfer). If monitoring revealed that populations of the first-to-decline grazing or browsing sentinel plant species (refer to appendix F) were not viable, a balanced reduction in permitted livestock numbers and in wild ungulate numbers would occur. Similarly, prescribed fire would be used to enhance wildlife habitat and improve forage for livestock.

Wildfire. The Service would work with DNRC to make forage available on the refuge to replace forage on State lands that is reduced due to use of prescribed fire in a burn unit containing refuge land and State land. Aggressive initial attack would be used in identified habitat units to minimize economic loss from wildfire. Fire (both prescribed fire and wildfire) would be used as a mechanism for natural succession in habitat units. To minimize fuel loading, additional use of prescriptive grazing could be necessary.

Invasive Species. Similar elements as for alternatives B and D. The Service would work with partners to increase efforts to reduce the acreage of invasive species and measure trends of other species not currently classified as noxious.

Climate Change. Same as B and D.

Water Resources

In addition to elements in alternative A, the Service would allow for natural and constructed water sources for livestock use and public fishing and hunting. Future water developments would be allowed on a site-specific basis and consideration of effects (positive and negative) to all resources. The Service would adhere to any other regulatory or permitting requirements and would balance water-quality restoration with public use and economic needs.

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Wildlife

Through collaboration with MFWP and others, the Service would maintain a balance between numbers of big game (elk, deer, and pronghorn) and livestock to sustain habitats and populations of big game and sharp-tailed grouse. Similar balancing could be necessary when managing for nongame or migratory bird populations and livestock needs. For example, it could be necessary to balance prairie dog populations and habitat needs with public and economic uses like livestock grazing or with other wildlife population needs.

The staff would work with partners to increase fish populations in the Missouri River and its tributaries and in artificially developed impoundments or to create new impoundments for fish populations and livestock water.

At the landscape level, the emphasis would be on public and economic uses, and the Service would work with others to identify and secure public access to the refuge, manage all ungulate species to benefit all wildlife species, and work to promote private conservation easements.

Reintroductions. Suitable habitat for Rocky Mountain bighorn sheep would be identified, and a new population would be established in accordance with suitability models and MFWP transplant criteria.

Threatened and Endangered Species and Species of Concern

Threatened and endangered species would be protected, but there would be less intensive manipulation of habitat for those species. Similar to alternative B, a wolf and a grizzly bear management plan would be developed in accordance with Federal and State regulations and plans to address potential immigration of these species to the refuge.

PUBLIC USE and EDUCATION

The Service would emphasize and maximize opportunities for wildlife-dependent use, as described below.

Hunting

Working with MFWP to improve habitat, the Service would maximize hunting opportunities by expanding (1) programs to include new species and traditional or niche (primitive weapon) hunting, (2) the mule deer season, and (3) predator hunting. Additionally, there would be an expanded program offering opportunities to young people to go hunting. Trapping could be allowed.

Fishing

Increased fishing access would be provided to areas that are no longer accessible due to the changing level of Fort Peck Lake. The Service would consider permitting vehicular access to shorelines for ice fish-

ing in the winter. Additional fishing opportunities would be created by stocking stock select reservoirs and holding fishing events for young people and fishing groups.

Wildlife Observation, Photography, Interpretation, Environmental Education, and Outreach

The Service would create programs based on popular activities such as hunting, fishing, birding, camping, photography, and all other wildlife-dependent activities. Curriculum-based activities would focus on threatened and endangered species, reintroduced species, restoration activities, and aquatic species including invasive aquatic species.

New areas for wildlife viewing would be identified, and ecotourism opportunities would be increased. The Service would work with partners to develop an interpretive center at Sand Creek Field Station, construct an interpretive trail near the Sand Arroyo area, and increase the interpretation of paleontological resources.

To encourage more children to visit the refuge, the refuge would consider sponsoring geocaching (a hobby in which objects are hidden outdoors for people to find using Global Positioning System [GPS] positions posted on the Internet). In addition, programs for troubled youths would be increased.

Access

Refuge access would be managed to benefit public and economic uses. The Service would consider expanding access (establishing new roads or trails) in some areas along with seasonally closing other areas, such as those around Fort Peck, to protect habitat and to provide for a diversity of experience. Access to boat ramps would be improved. The Service would promote nonmotorized access but would consider allowing motorized access on existing seasonally closed roads for game retrieval only. The Service would evaluate creating more trails that are open for bicycle use. Working within existing policies, livestock permittees would be allowed to manage infrastructure and stock within habitat units, or the Service would consider designating administrative use-only roads for livestock management where appropriate and allowed by policy and laws.

Recreation Sites

The Service would collaborate with other agencies to provide facilities and services that enable people of all abilities to enjoy the education and recreation opportunities at the refuge.

New campsites and campgrounds would be considered, if needed. For example, the Service would evaluate the need for designated horse camps or campsites along the lake.

Commercial Recreation

Commercial recreation would be permitted if it contributes to the refuge purposes or the mission of the Refuge System. The Service would increase opportunities for appropriate and compatible commercial recreation such as promotion of ecotourism tours and experiences on the refuge. Outfitting permits would be increased, and the Service would ensure this does not negatively affect public hunting. The Service would coordinate with USACE on commercial activities occurring on Fort Peck Lake and the Missouri River where USACE has primary jurisdiction.

WILDERNESS

In addition to the wilderness elements in alternative A, the Service would evaluate and make recommendations about whether the proposed wilderness units still meet the wilderness criteria. The Service would recommend eliminating four proposed wilderness units of about 35,881 acres in the East Beauchamp Creek, West Beauchamp Creek, East Hell Creek, and Burnt Lodge units.

CULTURAL and PALEONTOLOGICAL RESOURCES

Cultural resources and paleontological resources would be protected as identified in alternative A.

Cultural Resources

In addition to elements in alternatives A, B, and D, the Service would increase education-oriented ecotourism opportunities (nonconsumptive). The refuge staff would develop brochures and kiosks that interpret cultural resources and work with others to identify or stabilize cultural resources. There would be more use of interpretive signs, but archaeological sites would not be identified.

Paleontological Resources

The Service would increase educational opportunities and permits for universities. Documentaries and classes would be promoted. The Service would consider the purchase of inholdings for protection.

REFUGE OPERATIONS and PARTNERSHIPS

The vision and goals would be met through proportionate refuge operations and the refuge's collaboration with many partners.

Refuge Operations

The refuge relies on personnel, equipment, and facilities to carry out both the day-to-day operations along with the long-term programs.

Personnel. In addition to elements in alternative A, the Service would increase personnel to include an

outdoor recreation planner at each of the Fort Peck and Lewistown field stations, a full-time law enforcement officer at Fort Peck Field Station, a manager at the UL Bend refuge, two maintenance employees, and a fire specialist on the east end of the refuge.

(Same as D.)

Equipment and Facilities. In addition to elements in alternative A, the Service would expand facilities at Jordan Field Station and provide more office space at Jordan and Sand Creek field stations. A bunkhouse would be built at Fort Peck Field Station and an interpretive center at Sand Creek Field Station.

Land Acquisition. Same as B.

Minerals. Same as B.

Partnerships and Collaboration

Same as B.

3.7 Summary of Alternative D (Ecological Processes Emphasis, Proposed Action)

In cooperation with our partners, the Service would use natural, dynamic ecological processes and management activities in a balanced, responsible manner to restore and maintain the biological diversity, biological integrity, and environmental health of the refuge. Once natural processes are restored, a more passive approach (less human assistance) would be favored. There would be quality wildlife-dependent public uses and experiences. Economic uses would be limited when they are injurious to ecological processes. Figure 10 depicts the management of resources and public use for alternative D.

HABITAT and WILDLIFE MANAGEMENT, THREATENED and ENDANGERED SPECIES and SPECIES of CONCERN, RESEARCH and SCIENCE, and FIRE MANAGEMENT

Goals for the topics above are intricately linked in managing habitat, wildlife, and water resources. The elements below reflect these relationships for alternative D.

Habitat

Where feasible, the Service would apply management practices that mimic and restore natural processes on the refuge, managing for a diversity of plant species in upland and riparian areas. Initially, this would include a concerted manipulation of habitats or wild-

back of Figure 10 west

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Figure 10 west

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Figure 10 east

back of Figure 10 east

life populations (prescribed fire and grazing and hunting) through coordinated objectives. Eventually, the Service would favor more passive approaches using fire, grazing, or flooding, which require less manipulation and funding.

The Service would maintain plant diversity and health using fire in combination with wild ungulate herbivory (wildlife feeding on plants) or prescriptive livestock grazing, or both. The objective would be to ensure viable populations of sentinel plant species (refer to appendix F), which are those plant species that decline first when management practices are injurious.

Livestock Grazing. The Service would remove interior fences to facilitate management of environmental processes including patch burning and long-distance movement of animals. Generational transfer of permits would continue; however, grazing would be on a prescriptive basis. In sensitive areas like river bottoms, fencing would be used to exclude livestock except at designated water gaps (areas where livestock can access water).

Wildfire. The Service would restore the natural fire regime through an increased use of prescribed fire to increase the viability of fire-dependent plant species. The Service would burn patches of varying size and within the historical fire-return intervals on a rotational basis. This technique would create a mosaic of habitats that (1) restores heterogeneity (more natural diversity in species) within landscapes, (2) preserves fire refugia (areas where fires occur very infrequently or not at all) and associated plant species, (3) enhances food resources for wildlife, (4) ensures biological diversity and integrity and environmental health, and (5) promotes ecological resilience. Furthermore, some areas could need intensive manipulation with mechanical and hand restoration tools. The Service would minimize the use of fire in other areas to protect species of concern like the greater sage-grouse.

The Service would work with partners to address wildland-urban interface areas at the Pines Recreation Area and other USACE recreation areas. In adherence with an approved fire management plan and using historical fire frequency data and current fire conditions, the Service would evaluate each wildfire to determine the management response and whether the wildfire could be used in the patch-burning program.

Invasive Species. Similar to elements in alternatives A, B, and C, the Service would work with many partners to combat invasive plants and encourage growth of native vegetation. When feasible, the Service would also work with USACE and others on habitat enhancement to benefit plovers, terns, or other species of Federal and State concern along the shoreline.

The biological potential and economical feasibility of using additional biological control measures would be evaluated for safety and effectiveness as a way to reduce the use of chemical controls for treatment of invasive plant infestations.

Climate Change. Same as B and C.

Research

Research and monitoring would be designed to understand the interaction between fire, grazing, plant response, wildlife populations, and other ecological factors. The Service would adopt an active approach to using livestock grazing as a management tool by shifting from traditional annually permitted grazing to a prescriptive grazing regime for enhancement of wildlife habitats. If monitoring revealed that adequate populations of sentinel plant species were not viable, changes in livestock permitting such as reduced AUMs or retired permits would be initiated.

Water Resources

In addition to the water resources elements in alternative A, the Service would work with others to restore or encourage natural water development within streams such as increased flow, pools, and beaver ponds to restore ecological processes. The Service would refer to riparian research and publications for guidance on improving water quality in identified areas. Additionally, the Service would assess the uses and needs of current reservoirs and remove those no longer needed for livestock or wildlife.

Wildlife

In collaboration with MFWP and others, the Service would maintain the health and diversity of all species' populations including game, nongame, and migratory bird species by restoring and maintaining balanced, self-sustaining populations. This could include manipulating livestock grazing and using hunting to control wildlife numbers, or both, if habitat monitoring determines conditions are declining or plant species are being affected by overuse.

The Service would review plans for the Partners in Flight program and joint ventures to identify key parameters for improving habitats to support grassland-dependent birds. Additionally, the Service would collaborate with others to prevent species from being listed, primarily through restoring biological diversity, integrity, and environmental health across the landscape.

Predator control by the U.S. Department of Agriculture (Wildlife Services) would be eliminated, and predators would be managed to benefit the ecological integrity of the refuge.

Reintroductions. Similar to wildlife elements in alternatives B and C, the Service would work collabor-

actively with MFWP and adjoining landowners to identify suitable habitat for Rocky Mountain bighorn sheep and establish new populations using modeling and transplant criteria.

At a landscape scale, the Service would work with others on ways to benefit wildlife diversity and health such as (1) promoting private conservation easements and conservation incentives to benefit species diversity or restore extirpated (eliminated) species, and (2) cooperating with MFWP to consider species reintroductions or expansion of species when there is adequate habitat to support the species.

Threatened and Endangered Species and Species of Concern

In addition to the elements for threatened and endangered species and species of concern in alternative B, populations of the black-tailed prairie dog would be expanded to maintain or increase the health and diversity of all species' populations where prairie dogs are a critical component.

PUBLIC USE and EDUCATION

The Service would emphasize quality (versus quantity) wildlife-dependent uses and experiences and secure access to the refuge, as described below.

Hunting

The Service would cooperate with MFWP to provide hunting experiences that maintain big game species and other game species at levels that sustain ecological health and improve habitat but that also provide opportunities for quality experiences including diverse male-age structures provided by appropriate population objectives. When formulating population management objectives, the Service would consider natural densities, social structures, and population dynamics at the refuge level as well as guidance found in national policies, such as the biological integrity policy. The Service would allow opportunities for limited, compatible, and appropriate hunting and trapping.

Fishing

The Service would cooperate with other agencies to enhance fishing opportunities while maintaining game species and other species.

Wildlife Observation, Photography, Interpretation, Environmental Education, and Outreach

Environmental education and interpretation programs would incorporate the Service's conservation goals in the themes, messages, and activities. The Service would provide opportunities for wildlife observation and photography across diverse habitats that show the full spectrum of plant and animal species found in the area.

Access

Refuge access would be managed to benefit natural processes and habitat. The Service would evaluate roads and initially implement permanent or seasonal road closures on about 23 miles of road as needed to encourage free movement of animals, permit prescribed fire activities, harvest wild ungulates, provide for quality wildlife-dependent recreation, or allow other activities that contribute to overall improved ecological health. The Service would consider allowing motorized access on existing seasonally closed roads for game retrieval only. If conditions warrant, other improvements or closures would be considered.

Working with USACE and other agencies, the Service would monitor boat use along the Missouri River to determine use levels and whether wildlife disturbance, particularly during hunting season, was an issue. The Service would then work with cooperators and users to manage access where needed to limit disturbance to wildlife along the river corridor. Motorized vehicle use would be monitored on numbered trails and managed if there is documented disturbance of wildlife or visitors.

Bicycles would be restricted to numbered roads only, including seasonally closed roads. The Service would provide facilities and services that enable people of all abilities to enjoy the education and recreation opportunities available on the refuge.

Recreation Sites

Facilities would be upgraded and designed to meet accessibility standards. Camping needs would be evaluated as use changes on the refuge; adaptive management (refer to figure 11 under section 3.12) would be used to address camping demand, for example, harden the frequently used sites to minimize erosion and effects on habitat. Camping would be limited to within 100 yards of numbered routes.

Commercial Recreation

The Service would only permit commercial recreation when it benefits natural ecological processes or habitats. For example, commercial activities could be allowed in roadless areas to facilitate big game harvest for meeting wildlife and habitat objectives.

WILDERNESS

In addition to the wilderness elements in alternative A, the Service would evaluate proposed wilderness units according to Service policy to determine if they still meet the wilderness criteria. The Service would recommend expanding six of the proposed wilderness units—a total of 18,559 acres in the Antelope Creek, Crooked Creek, Alkali Creek, Wagon Coulee, West Hell Creek, and Sheep Creek units—and eliminating three units for a reduction of 26,744 acres in the

East Beauchamp Creek, West Beauchamp Creek, and East Hell Creek units. This would accommodate more public access in some areas and increase protection of wilderness values in other areas.

CULTURAL and PALEONTOLOGICAL RESOURCES

Cultural resources and paleontological resources would be protected as identified in alternative A.

Cultural Resources

Same as B.

Paleontological Resources

Similar to B.

REFUGE OPERATIONS and PARTNERSHIPS

The vision and goals would be met through proportionate refuge operations and the refuge's collaboration with many partners.

Refuge Operations

The refuge relies on personnel, equipment, and facilities to carry out both the day-to-day operations along with the long-term programs.

Personnel. Same as C.

Equipment and Facilities. In addition to elements in alternative A, the Service would expand facilities at Jordan Field Station and provide more office space at Jordan and Sand Creek field stations. A bunkhouse would be built at Fort Peck Field Station. The Service would collaborate with others to develop a science and interpretive center at Sand Creek Field Station.

Land Acquisition. In addition to elements in alternatives B and C, the Service would look to facilitate the exchange of State lands within the refuge boundary where feasible.

Minerals. Same as B.

Partnerships and Collaboration

In addition to the partnerships and collaboration elements in alternatives B and C, the Service would seek ways to highlight refuge resources including the use of promotional materials.

3.8 Objectives and Strategies

As discussed in sections 3.1 and 3.3 above, the alternatives stemmed from the planning goals identified in chapter 2. This section describes the specific objectives that would achieve the goals and meet the emphasis of each alternative. Objectives are concise statements of what needs to be achieved; how much, when, and where it would be achieved; and who would be responsible. To the extent possible, each objective has been developed to be specific, measurable, achievable, results-oriented, and time-fixed (FWS 2000c). Timeframes for the objectives are based on the assumption that implementation will begin following the record of decision for the final CCP and will occur over 15 years.

Objectives provide the basis for determining strategies, monitoring refuge accomplishments, and evaluating success in meeting the goals. Strategies are specific tools or techniques used to carry out the objectives. An explanation, or rationale, for each objective describes how and why the objective's actions are important to achieving the associated goal in conjunction with the alternative's emphasis.

Each goal title is listed below, followed by the associated objectives, rationale, and strategies for each of the four alternatives A–D. Where an objective or strategy is similar or the same as for another alternative, this has been noted and for conciseness it is generally not repeated.



Redosier Dogwood

OBJECTIVES for GOALS

Habitat and Wildlife Management, Threatened and Endangered Species and Species of Concern, Research and Science, and Fire Management

The above goals are intricately linked in managing habitat, wildlife, and water resources; therefore, the objectives for all these goals are grouped in this section under three topics—habitat, wildlife, and threatened and endangered species and species of concern.

- The habitat objectives are split into four vegetation categories: upland, river bottom, riparian area and wetland, and shoreline. There are additional objectives for the major factors that influence habitat: invasive species, prescribed fire, wildfire, and climate change.
- While the habitat objectives would benefit most wildlife on the refuge, the following categories of wildlife were identified based on scoping comments and have specific objectives: big game (elk, deer, pronghorn, Rocky Mountain bighorn sheep, and mountain lion), furbearers, bison, birds, gray wolf, and other wildlife (invertebrates, amphibians, reptiles, fish, and small mammals).
- Objectives for threatened and endangered species and species of concern are for the following species: black-footed ferret, least tern, pallid sturgeon, piping plover, grizzly bear, gray wolf, black-tailed prairie dog, greater sage-grouse, mountain plover, burrowing owl, sicklefin chub, sturgeon chub, and northern leopard frog.

HABITAT–UPLAND

Each species of wildlife that uses the uplands has unique habitat needs. Their requirements for food, water, and protection are different. Ecological processes (disturbances) affect each species' habitat. The major disturbances that occur in the uplands are herbivory (ungulate grazing) and fire. Uplands exist in alternate states depending largely on the frequency and intensity of herbivory and fire.

Objectives for Upland Habitat, Alternative A

In large part, existing habitat objectives and strategies are based on the decisions resulting from the record of decision on the 1986 resource management plan and EIS for the refuge (FWS 1986). Although many actions have been carried out, under alternative A the upland habitat would be managed according to direction set by this earlier plan. The 1986 plan blended objectives and strategies, and these were separated to the extent practical to more closely follow the below format used in current CCPs. Rationale statements were pulled from the 1986 plan or are based on direction stemming from the plan.

Upland A1. Over 15 years, continue to manage refuge habitats in the 65 habitat units (see figure 16 in chapter 4) that were originally established by BLM for grazing purposes and that were based on habitat management plans (HMPs) developed in the early 1990s.

Rationale for Upland A1. Each HMP describes wildlife habitat issues and provides specific management actions—such as grazing seasons of use, prescribed fire, planting, and rest—to correct problems from grazing if necessary. These actions would continue to be coordinated with BLM in joint pastures; the plans recognized that BLM and the Service have different management objectives for livestock grazing (FWS 1986).

Upland A2. By 2013, increase the quantity and quality of deciduous shrubs using prescribed fire on about 1,900 acres and on a total of 7,700 acres by 2028.

Upland A3. By 2013, plant shrubs on about 100 acres and on a total of 500 acres by 2028.

Upland A4. Over 15 years, continue planting shrubs on about 25–30 acres per year.

Rationale for Upland A2–A4. Habitat analysis indicates that deciduous shrub species are declining in both in abundance and vigor on the refuge, and historical accounts indicate shrubs were once more abundant than current conditions. HMPs would determine the best means of reestablishing shrubs in each habitat unit; management actions would require adjustments in grazing, prescribed fire, and planting, in that order. Shrubs would be planted to reestablish a seed source for natural revegetation, and it is estimated that this would involve about 25 acres per year depending on the success of grazing adjustments and prescribed fire. Following prescribed fire or planting, grazing would not be allowed until plants are successfully established.

Upland A5. Over 15 years, continue a gradual move toward prescriptive grazing. Make the transition only when units become available through sale of a ranch to a third party or habitat evaluations are completed, or both, and when prescriptive grazing is identified as necessary to meet wildlife or habitat objectives.

Upland A6. Over 15 years, use grazing at current levels to maintain existing plant communities at desired habitat conditions at light livestock grazing levels.

Upland A7. Over 15 years, implement a monitoring program to determine if additional changes in graz-



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Refuge staff monitor plants on the refuge.

ing would need to be implemented on specific areas not responding to upland management.

Rationale for Upland A5–A7. The specified number of AUMs is based on what would have been permitted in 2009 if all grazing permittees exercised their full permitted AUMs. Since implementation of the 1986 record of decision, several ranches have sold. Furthermore, livestock grazing permits do not transfer with the sale of a ranch (FWS 1982; *Schwenke v. Secretary of the Interior*, 720 F.2d 571, Ninth Circuit Court of Appeals, 1983).

The 1986 record of decision called for livestock grazing to be substantially reduced to improve habitat conditions for wildlife. Each habitat unit (see figure 16 in chapter 4) was examined in terms of existing range conditions, slope, water, and soil limitations. Concurrently, the Service evaluated wildlife habitat conditions by habitat unit and noted deficiencies. In most areas where evaluation demonstrated existing livestock-wildlife conflicts, limitations of slope, water, and soil were the reason for the necessary grazing change. In the remaining areas, grazing adjustments allowed the achievement of applicable wildlife objectives. This process determined that light grazing (0–35 percent utilization) coupled with various seasons of use would achieve the diversity of habitat conditions mandated by the refuge goals and objectives. Most livestock grazing would continue on a seasonal basis (winter, spring, summer, fall, or

combination of seasons), although spring turn-in dates would be later and grazing would be reduced to light stocking levels. Early spring use would be eliminated.

The use of livestock grazing as a management tool would provide habitat conditions to benefit particular wildlife species. In years of below-average forage production due to drought, fire, insects, or other natural causes, grazing permits might be suspended in whole or in part to minimize damage to range and wildlife resources.

Upland A8. By 2013, fence at least one habitat unit. Fence other portions of the boundary if problems arise with unauthorized livestock use. Construct only a limited amount of interior fencing.

Rationale for Upland A8. About 425 miles of fence have been constructed between 1986 and 2009, and additional fence may be required. Fence would be constructed where necessary to achieve objectives; the location of fences would be determined after consultation among the concerned parties.

Strategies for Upland A1–8. Many of these strategies are the tools selected in the record of decision from the 1986 EIS.

- Construct fences where necessary to achieve agency objectives, with locations to be determined after consultation among the concerned parties from when the HMPs were written.

- Construct fences in the best and most practical locations.
- Construct boundary fence to be 42 inches high and 3-strand with 12 inches between wires; in areas where pronghorn would likely encounter fences, place the bottom wire 18 inches above the ground and use smooth wire.
- Potentially locate new water facilities or implement grazing systems designed to meet objectives for both the Service and BLM in suitable common pastures.
- Upgrade habitat evaluation criteria as information becomes available.
- Continue inventorying and monitoring wildlife and habitat at existing levels including monitoring of residual cover and sentinel plants.
- Establish sampling techniques to monitor at prescribed intervals the long-term changes in wildlife habitat and range conditions. Use different treatments for habitat if evaluations indicate that wildlife objectives were not met.
- Phase out cooperative farming and haying along bottomlands of the Missouri River. Use lure cropping (planting crops to draw elk to those areas) on the refuge's west end to decrease elk depredation on adjoining private croplands. Install about 6 miles of fence (900 acres) to protect selected riparian areas from livestock and enhance shrub reproduction.
- Acquire several priority land parcels totaling about 2,000 acres by willing-seller basis only. Acquire additional land in pronghorn range.
- Eliminate sheep grazing on the refuge unless needed on a prescriptive basis to manipulate vegetation.
- Continued to emphasize big game management, annual livestock grazing, fencing, invasive species control, and water development.

Objectives for Upland Habitat, Alternative B

The Service would manage the upland grassland-shrub mosaic and conifer-grassland mosaic with prescriptive grazing and prescribed fire. The management emphasis would be on single target species in separate uplands of the refuge, largely based on the recommendations of Olaus Murie's original biological assessment (refer to chapter 4). Management criteria would focus on the food, protection, and water needs of each target species. Where needed, using artificial food resources would be provided to promote wildlife populations.

Upland B1. Within 3 years, develop new HMPs for target plant and wildlife species (primarily elk, pronghorn, and sharp-tailed grouse) that are defined in Olaus Murie's 1935 biological assessment (refer to chapter 4). Base the HMPs on habitat units that are

ecologically similar. Develop specific habitat evaluation and management plans for each target species.

Upland B2. Within 3 years, in cooperation with universities, the Natural Resources Conservation Service (NRCS), other partner scientists and statisticians, continue to develop and modify methods to identify, inventory, and monitor target species' habitat needs and management actions.

Upland B3. Within 4–7 years, develop a prescriptive livestock-grazing plan for 50–75 percent of the refuge in all locations where boundary fences or cooperative agreements with wildlife conservation partners exist.

Upland B4. Over 15 years, fence 50–75 percent of the unfenced refuge boundary or the boundary established with wildlife conservation partners.

Upland B5. Over 15 years, evaluate the success of management treatments with population surveys or habitat surveys (height-density plots [HDPs] or sentinel plants [refer to appendix F], or both). Develop adaptive management strategies (refer to section 3.12 and figure 11) if wildlife populations or habitats are not responding as anticipated.

Upland B6. Over 15 years on 30–50 percent of the refuge, improve overall habitat conditions based on HDPs and sentinel plant monitoring where 70 percent residual cover is achieved with viable populations of sentinel plant species by managing herbivory through time and place. There would be 25–50 percent of selected populations of sentinel species that reach the height and fruit-bearing potential in locations without physical protection on all four sides of plants.

Upland B7. Within 5 years, work with range ecologists and biostatisticians to establish a protocol to assess wildlife habitat conditions. Every 7–10 years, monitor habitat health to evaluate conditions for meeting wildlife needs.

Upland B8. Over 15 years, maintain existing densities or populations of fire-intolerant big sagebrush on fire refugia (areas where fire is generally absent) to support sage-dependent species in each of the habitat units to restore shrub diversity in the shrub-steppe uplands.

Rationale for Upland B1–B8. Much of the focus for the upland objectives is based on the earliest assessment of the refuge and surrounding area. In August 1935, Olaus J. Murie, a renowned wildlife biologist for the U.S. Biological Survey (eventually the U.S. Fish and Wildlife Service), traveled to the proposed game range and filed his Report on the Fort Peck Migratory Bird Refuge (Murie 1935). This report was the first biological assessment of the existence and abundance of plants and wildlife species. Murie documented the abundance of many plants—yellow pine or ponderosa

pine, cottonwood, willow, juniper, grasses including gramma grasses, buffaloberry, and snowberry—along with wildlife species including mule deer, white-tailed deer, pronghorn, black-footed ferret, coyote, and sharp-tailed grouse. Additionally, Murie identified species (elk, bison, and Audubon bighorn sheep) for which he found evidence of earlier occupation, and he discussed whether they could or should be reintroduced. Murie's biological assessment would be used to inform the basis for the target species (plant and wildlife) emphasized under alternative B.

While several habitat units have recovered from past abuse, current monitoring has identified several units that are not meeting their stated habitat objectives as identified in 1986 EIS and associated HMPs. Alternative B would remove annual livestock grazing from the refuge in all habitat units that are fenced separately from surrounding lands. Only prescriptive grazing would be permitted. Continuing construction of the refuge boundary fence would be a priority so that all refuge lands would have the potential for best wildlife management practices. Removal of interior fencing would also be a priority due to the ending of annual grazing; interior fences would be removed from units enrolled into prescriptive grazing to facilitate the movement of all ungulates. Prescriptive grazing practices could then be applied to larger areas if needed. Fence removal and construction would be an ongoing process that would take time and would need to be prioritized. As a result, the Service estimates that only 75 percent of the refuge would convert to prescriptive grazing; however, if funding and resources permitted, more areas would be converted over 15 years.

Reducing the number of HMPs and developing HMPs along field station boundaries or units that are ecologically similar would increase efficiency in managing for a prescriptive grazing and fire regime. The habitat requirements (food, water, and cover) for each target species would be provided across large landscapes. Managing in larger habitat blocks instead of 65 fenced units would (1) allow for increased long-distance animal movement (animals move greater distances to seek the best forage due to patch burns), and (2) enable the refuge to target the differing habitat requirements (food, cover, and water) of each target species.

Wildlife population surveys and habitat surveys would indicate improving or worsening conditions for targeted wildlife populations. Additionally, surveys would provide measures of the success of habitat treatments using the HDP method and procedures developed to monitor the food, protection, and water needs of each target wildlife species. The HDP method records the height of visual obstruction of plant cover. A measuring pole is observed at points along a line transect from a set distance and angle. It

provides a measure of residual cover remaining after livestock grazing has occurred.

Sentinel plants are species that are the first to decline as a result of too much or too little expression of ecological processes. Viable populations should include large collections of sentinel plants that are mature and bearing abundant fruit or seeds, young plants recently sprouted from seed, and all intermediate stages. While sentinel species would not be emphasized under this alternative, they would still be included. Service personnel are working with Oklahoma State University, WEST, Incorporated, and NRCS to develop monitoring techniques for sentinel plants. This work would identify the key sentinel plant species for fire and herbivory, evaluate various survey techniques, and develop methods for measuring changes in populations and robustness. (See a full discussion of sentinel plants under alternative D).

Strategies for Upland B1–B8

- Within 2 years, determine the habitat needs and current conditions for target wildlife species on specific sites.
- Continue to work with range ecologists and use existing knowledge from current monitoring to develop adaptive management strategies as new information is acquired.
- Continue current HDP readings and implement HDP surveys to measure residual cover within 25–50 percent of the areas currently absent of livestock.
- Within 3 years, develop new HMPs based on recommendations found in Olaus Murie's field notes. In HMPs, include effective implementation of new management strategies (such as prescriptive grazing, prescribed fire and wildfire return, habitat monitoring and enhancement, and food plots) that promote desired habitat conditions.
- Within 4–7 years, implement prescriptive grazing, prescribed fire, and habitat restoration and consider the use of artificial food resources to promote wildlife populations with emphasis on single-species management based on recommendations in Olaus Murie's original biological assessment.
- In cooperation with universities, NRCS, and other partner scientists and statisticians, continue to develop and modify methods to identify, inventory, and monitor sentinel plant species.
- Identify areas for implementing pyric herbivory (patch burning and grazing) to restore historical fire-return intervals and the fire-grazing interaction including concentrated herbivory coupled with long periods of abandonment (rest) to increase the amount and diversity of palatable plants to reduce selectivity for sentinel species.

- If monitoring for the population viability of herbivory-sensitive sentinel plant species within a unit indicates a declining population, take the following actions: (1) eliminate prescriptive livestock grazing in the unit; and (2) cooperate with MFWP to manage elk, deer, and bighorn sheep to meet objectives in the MFWP's management plans for the Missouri River Breaks. Where monitoring indicates habitat conditions and sentinel plants are stable, the Service would work with MFWP to manage for higher deer and elk populations (refer to objectives for Big Game).
- Evaluate success of habitat treatments by using HDPs and sentinel plant monitoring in permanently established trend sites to assess the population viability of all plant species and structural heterogeneity of the landscape.
- Over 15 years, remove 25–50 percent of the interior fences where prescriptive grazing is fully implemented and construct refuge boundary fences where absent, on priority basis. Potentially expand boundary fences to include partner lands that share the same objectives and strategies.
- Hire seasonal employees for fence removal and professional fence builders for boundary fence construction of remaining fences (the remaining boundary fences are located in the most difficult terrain).
- Implement prescriptive grazing across the refuge through the development and implementation of HMPs by working with BLM, DNRC, conservation districts, and permittees. Use prescriptive grazing only on Service-managed lands. Since it is possible that prescriptive grazing practices on Service lands may impact current permittees that graze BLM, DNRC, and Service lands, work with DNRC as budgets allow to mitigate any loss of revenue by assuming leases on these pastures. (Same strategy in alternatives C and D).
- Manage with MFWP the total ungulate effects collectively rather than each species alone.

Objectives for Upland Habitat, Alternative C

The Service would manage the present habitat units to improve range condition with domestic and wild ungulates as defined by NRCS ecological site condition and management guidelines.

Upland C1. Within 7 years, develop new HMPs (based on factors such as soil characteristics, historical fire occurrence, grazing, and field station boundaries) in cooperation with the NRCS. Within the HMPs, include fencing for better livestock distribution, water development, rotational grazing, and other management techniques designed to improve range condition.

Upland C2. Within 3–6 years, in cooperation with the NRCS, conduct ecological site evaluations on habitat units with boundary fences that permit control over livestock numbers and management. Continue current HDP surveys and implement surveys in 50 percent of the areas currently absent of livestock to measure residual cover.

Upland C3. Over 15 years, implement a prescriptive grazing program on up to 50 percent of the refuge by continuing the practice of holding grazing permits as ranches sell their lands to outside parties.

Upland C4. Over 15 years, develop pyric-herbivory (relying on fire and wildlife grazing interaction) programs for habitat units where boundary fences or cooperative agreements with wildlife conservation partners exist and where physical features allow for efficient use of fire as a management tool.

Upland C5. Over 15 years, coordinate the construction of boundary fences to facilitate a move to a prescriptive grazing program with the BLM, DNRC, and local ranchers.



Dave Menke/USFWS

Upland habitat is important to the lazuli bunting.

Upland C6. Over 15 years, evaluate the success of prescriptive grazing and the pyric-herbivory program with HDPs and sentinel plant monitoring in locations where the Service has the capability to manage ungulates. Measure success through a comprehensive monitoring program that evaluates changes in viability, distribution, and robustness of individual sentinel plants within established plots. Develop adaptive management changes if sentinel plants continue to decline (refer to section 3.12 and figure 11).

(Same as Upland D5.)

Upland C7. Over 15 years, improve habitat conditions, based on HDPs and sentinel plant monitoring, on 20–40 percent of the refuge. Manage habitat conditions for a minimum of 70 percent residual cover and viable populations of sentinel species where 30–60 percent of selected sentinel species populations are able to reach height and fruit-bearing potential in locations without physical protection on all four sides of plants.

Upland C8. Within 2–4 years, begin working with range ecologists and biostatisticians to develop and establish a protocol to assess the effectiveness of the sentinel species concept on select areas of the refuge absent of livestock. Every 7–10 years, monitor habitat health, heterogeneity, and ecosystem resilience (the ability to recover from disturbance or stress).

(Same as Upland D6.)

Upland C9. Over 15 years, increase both the population viability and a 1–5 percent increase in coverage by winterfat, saltbush, grey rubber rabbitbrush, and other fire-adapted sentinel species on sites with remnants of these species.

Upland C10. Over 15 years, maintain existing stands or densities of fire-intolerant big sagebrush on fire refugia to support sage-dependent wildlife species in each of the habitat units while restoring shrub diversity in the shrub-steppe uplands (such as fire refugia, sage-grouse leks, and the UL Bend refuge).

(Same as Upland D8.)

Upland C11. Over 15 years, increase both the population viability and a 1–5 percent increase in coverage by purple prairieclover, white prairieclover, dotted gayfeather, purple coneflower, stiff sunflower, and other sentinel forb species as appropriate to sites with remnants of these species across 5–10 percent of the refuge.

Rationale for Upland C1–C11. Alternative C would retain livestock in habitat units that are currently permitted to local family-ranch operations. Some highly nutritious plant species such as saltbush, white prairieclover, and golden currant are highly preferred by both livestock and wild ungulates. These same plant species are also important to pollinators, birds (for seeds

and insects), and other wildlife species. Livestock and wild ungulates are competitive for sentinel plant species, the first to decline from herbivory. To preserve and restore biodiversity to the extent possible, wild ungulate numbers may need to be reduced.

HMPs would include fencing for better livestock distribution, water development, rotational grazing, and other management techniques designed to improve range condition.

As habitat units become vacant of livestock, they may be combined with other vacant or permitted units to implement a prescriptive grazing program, prescribed fire, or other habitat restoration tools to achieve excellent range condition, based primarily on the health of the grass community. Range condition would be improving if range communities were maintained at, or moving toward, an ecological site condition rating of high (NRCS 2003). Ecological sites that are similar to the historical or potential community have a higher condition rating than dissimilar sites. Ecological sites are based on soil, moisture, and vegetation potentials of different parts of the landscape.

Strategies for Upland C1–C11

- Within 3–6 years, determine the species of plants first to decline (sentinel species) due to herbivory and fire and due to lack of herbivory and fire in areas absent of livestock. Continue current HDP surveys and implement HDP surveys within 50 percent of the areas currently absent of livestock to measure residual cover.
- In cooperation with universities, NRCS, and other partner scientists and statisticians, continue to develop and monitor methods to identify, inventory, and monitor sentinel plant species.
- Over 15 years, as current habitat units become vacant of livestock, implement a prescriptive grazing program to restore the fire-grazing interaction, long-distance animal movement, long periods of abandonment, reducing selectivity for sentinel species, and increasing landscape species and structural heterogeneity.
- Improve the population viability of herbivory-sensitive sentinel plant species in three ways—ungulate number control, prescribed fire, and periods of rest.
- If monitoring for the population viability of herbivory-sensitive sentinel plant species indicates a declining population, cooperate with MFWP to manage deer, elk, and bighorn sheep to meet the objectives in the MFWP's management plans for the Missouri River Breaks.
- Manage all species of ungulates (wild and domestic) collectively and work cooperatively with others to address the effects of all ungulates rather than the effects of each species alone. Where annual

livestock grazing is permitted, compensate for the livestock forage use where and when possible by reducing the wild ungulate population levels.

- In habitat units with prescriptive livestock grazing only, manage the landscape with pyric herbivory (patch burning) to restore historical fire-return intervals and the fire-grazing interaction.
- In habitat units with prescriptive livestock grazing only, use concentrated herbivory coupled with long periods of abandonment to increase the amount and diversity of palatable plants to reduce selectivity for sentinel species.
- Evaluate success of habitat treatments (to achieve population viability of all species and structural heterogeneity of the landscape) with a focus on sentinel plant species, HDPs, and population viability analysis at permanently established trend sites.
- As HMPs for prescriptive grazing are developed for vacant habitat units, remove interior fences within the units where only prescriptive livestock grazing is permitted and construct refuge boundary fences where absent. Potentially expand boundary fences to include partner lands that share the same objectives and strategies.
- Hire seasonal employees for fence removal and professional fence builders for boundary fence construction of remaining fences (the remaining boundary fences are located in the most difficult terrain).
- Implement prescriptive grazing across the refuge through the development and implementation of HMPs by working with BLM, DNRC, conservation districts, and permittees. Use prescriptive grazing only on Service-managed lands. Since it is possible that prescriptive grazing practices on Service lands may impact current permittees that graze BLM, DNRC and Service lands, work with the DNRC as budgets allow to mitigate any loss of revenue by assuming leases on these pastures. (Same strategy in alternatives B and D).

Objectives for Upland Habitat, Alternative D

The Service would promote ecological resilience, restore the fire-grazing interaction (pyric herbivory), promote animal movement with long periods of abandonment to reduce plant species selectivity, and increase landscape species and structural heterogeneity. This alternative would address the objectives and strategies identified in the Service's Climate Change Strategic Plan (FWS 2009f).

Upland D1. Within 5 years, develop new HMPs, including inventory and monitoring plans based on soil characteristics and historical fire occurrence. Include effective implementation of new management strategies (prescriptive pyric herbivory, prescribed fire

and wildfire return, and sentinel plant monitoring and enhancement) that promote desired habitat conditions and restoring ecological resilience (see the rationale below for a definition).

Upland D2. Within 6–9 years, consolidate the 65 habitat units into 3–8 units for restoration of the fire-grazing interaction (pyric herbivory), long-distance animal movement, long periods of abandonment, reduced selectivity for sentinel species, and increased landscape species and structural heterogeneity (diversity or dissimilar species within a landscape) to promote resilience and stability of ecological systems.

Upland D3. Within 6–9 years, implement a prescriptive grazing program and pyric herbivory (patch burning and grazing by wildlife) across 50–75 percent of the refuge to restore the resilience and stability of ecosystems on the refuge.

Upland D4. Over 15 years, coordinate the construction of boundary fences to facilitate moving to a prescriptive grazing program with the BLM, DNRC, and local ranchers. Work with permittees in developing the HMPs, so they can make arrangements in their operations for future grazing needs.

Upland D5. Same as Upland C6.

Upland D6. Same as Upland C8.

Upland D7. Over 15 years, increase both the population viability and a 10–15 percent increase in coverage by winterfat, saltbush, grey rubber rabbitbrush, and other fire-adapted sentinel species on sites with remnants of these species across 20–30 percent of the refuge.

Upland D8. Same as Upland C10.

Upland D9. Over 15 years, increase both the population viability and 10–15 percent increase in coverage by purple prairieclover, white prairieclover, dotted gayfeather, purple coneflower, stiff sunflower, and other sentinel forb species as appropriate to the sites with remnants of these species across 20–30 percent of the refuge to restore diversity and promote ecological resilience of highly palatable, summer-growing forbs.

Rationale for Upland D1–D9. As described under alternative B, while several existing habitat units have recovered from past abuses, there are currently several units that are not meeting their stated habitat objectives as identified in the 1986 EIS and associated HMPs. A principal focus of alternative D is the directive found in the Service's Biological Integrity, Diversity, and Environmental Health Policy (FWS 2001). Using the concepts of resilience management (Resilience Alliance 2009), the Service would strive to improve the resilience in the refuge's ecological systems. Key components of resilience management

include major ecological processes or disturbances, alternate stable states, thresholds between states, adaptive cycles, cross-scale interactions, interventions, and management.

Resilience is the ability to absorb disturbances, to be changed, and then to reorganize and still have the same identity, that is, retain the same basic structure and ways of functioning. A resilient system is forgiving of external shocks; a disturbance is unlikely to affect the whole. As resilience declines, the magnitude of a shock from which it cannot recover gets smaller. A resilient habitat: (1) sustains many species of plants and animals and a highly variable structural composition; (2) is asymmetric; (3) exemplifies biological integrity, biological diversity, and environmental health; and (4) adapts to climate change (Resilience Alliance 2009).

In contrasting stability and resilience, Holling (1973) writes, “A management approach based on resilience, on the other hand, would emphasize the need to keep options open, the need to view events in a regional rather than local context, and the need to emphasize heterogeneity. Flowing from this would be not the presumption of sufficient knowledge, but the recognition of our ignorance; not the assumption that future events are expected, but that they will be unexpected. The resilience framework can accommodate this shift of perspective, for it does not require a precise capacity to predict the future, but only a qualitative capacity to devise systems that can absorb and accommodate future events in whatever unexpected form they may take.”

The following sources have more information about managing ecological resilience: Gunderson and Holling (2002), Walker and Salt (2006), Norberg and Cumming (2008), and the Resilience Alliance (2009).

As part of the actions needed to improve the resiliency of the refuge’s habitats, alternative D emphasizes restoration of the environmental processes, plants, and animals that have been damaged. This alternative calls strongly for the return of the evolutionary forces of fire and herbivory (grazing by wildlife) that shaped this landscape during the past 6,000 years. Total ungulate effects and fire effects on plant communities would be measured with diagnostic species (sentinel species). A list of these sentinel species is in appendix F.

When declining trends are found or when competition for resources results in habitat damage, livestock numbers would be reduced or eliminated before wild ungulates. The Service estimates it could convert about 75 percent of the refuge to prescriptive grazing due to the need to add or eliminate fences. Much of the fencing work that remains is in rugged terrain, and the work would need to be prioritized. If funding and resources permitted, more of the refuge could convert to prescriptive grazing over 15 years.

At the same time, the Service would work with grazing permittees so they can plan for and successfully adapt their operations to prescriptive grazing.

The Service would continue working with range ecologists, statisticians, other scientific disciplines from NRCS and universities, and other experts in using existing knowledge from current monitoring methods to develop adaptive management strategies as new information is acquired if habitat objectives were not met. HDP monitoring could be reduced as sentinel species management and monitoring programs are developed across the refuge. Many of the existing staff have expertise and education in range management. Monitoring for range health generally involves looking at the dominant community plants, mostly grasses, and determining if they are viable, versus the refuge’s wildlife habitat monitoring program, which would include looking at select plants that are the first to decline due to too much or too little fire and grazing that comprise the community and ensuring that they are healthy, vibrant, and able to reach maturity. Successful implementation of the objectives would be defined as follows:

- Fifty percent of populations of winterfat, saltbush, grey rubber rabbitbrush, and other fire-adapted sentinel shrub species were able to reach their height and fruit-bearing potential and successfully recruit young plants into the population on uplands without physical protection during normal weather conditions.
- Fifty percent of populations of chokecherry, golden currant, redosier dogwood, green ash, silver buffaloberry, aspen, cottonwood, limber pine, and other fire-adapted sentinel species would be able to reach their height and fruit-bearing potential and successfully recruit young plants into the population in coulees and riparian areas.
- Populations of purple prairieclover, white prairieclover, dotted gayfeather, purple coneflower, stiff sunflower, Maximilian sunflower, and other sentinel forb species have increased in coverage on remnant sites by approximately 10 percent over 15 years.
- Fire-intolerant species would be maintained in areas that did not burn or where there is a low fire-interval level.

Since the demise of the bison in 1881, the fire-return interval has lengthened on the refuge, and the fires that do occur are often more intense than commonly happened historically (Frost 2008). Figure 18 in chapter 4 shows the fire frequency intervals found on the refuge. The fire-grazing interaction (which included intense herbivory after fire, long-distance movement, and years of abandonment) was replaced by constant grazing and no fire with the transition to ranches, fences, and livestock. The landscape changed from patches of diverse habitats to a more uniform

landscape as a result of constant fire suppression and annual grazing within fenced pastures (Fuhlendorf and Engle 2001). Today, many species of plants that are fire-adapted, fire-dependent, or highly palatable have been locally eliminated or reduced to remnants. In the uplands, the formerly diverse shrub-steppe community now supports extremely low populations of fire-adapted, palatable shrub species such as salt-bush, winterfat, silver sagebrush, and grey rubber rabbitbrush. The landscape today is almost a monoculture of relatively unpalatable and fire-intolerant big sagebrush. In addition, highly palatable forbs such as white prairieclover are gone from most sites. Introduced plants such as Japanese brome and yellow sweetclover have prospered in this environment and have replaced native species that are more valuable. The lack of variety in management strategies has additionally reduced the heterogeneity of plant community structure.

These changes have affected wildlife populations. For example, grassland bird species have declined at a faster rate than any other guild of terrestrial birds in North America (Fuhlendorf and Engle 2001, Knopf 1994). Particularly affected are the sentinel bird species and sentinel habitats that are positioned at the ends of natural processes such as those species that live in the wake of recent fire or require long periods of no disturbance, such as Baird's sparrow. Also affected are species that require a wide diversity of vegetation structure and plant species within their home range such as sharp-tailed grouse and sage-grouse. There are similar concerns for some small mammals, invertebrates, and other wildlife groups.

Upland health would be restored on the refuge by reestablishment of historical fire-return intervals and the historical fire-grazing interaction. There would be careful control of the numbers of all ungulate species (both wild and domestic) to compensate for the overgrazing effects of the last 100–150 years. Inventory and monitoring procedures would focus on the first to decline plant species (sentinel species) that have been most severely affected. Monitoring would also include the grasses and other plants to ensure that all species' populations are viable.

Strategies for Upland D1–D9

- Within 2–4 years, fully determine the species of plants that are first to decline and the cause of the decline (refer to appendix F for the list of existing sentinel species).
- Continue to work with range ecologists and use current monitoring results, along with newly acquired information, to develop adaptive management strategies.
- In cooperation with universities, NRCS, and other partner scientists and statisticians, continue to

develop and monitor methods for identification, inventory, and monitoring of sentinel plant species. Reduce HDP monitoring as sentinel plant-monitoring procedures are developed that efficiently and consistently monitor habitat conditions.

- In cooperation with the NRCS, reestablish populations of sentinel plant species on 50 percent of the sites where they have been eliminated.
- Improve the population viability of herbivory-sensitive sentinel plant species in four ways: (1) control numbers of ungulates (domestic and wild); (2) coordinate management of ungulates and fire; (3) reduce selectivity by ungulates for sentinel species (through pyric herbivory); and (4) manage for long (several-year) periods of rest or abandonment.
- When monitoring of the population viability of herbivory-sensitive sentinel plant species indicates a declining population, manage livestock grazing by reducing AUMs or the season of use or by resting areas. If sentinel plant populations continue to decline after elimination of livestock grazing, explore opportunities to promote periods of rest or abandonment for sensitive areas. If sentinels continue to decline due to herbivory pressure, work with MFWP to reduce the numbers of large ungulates throughout the Missouri River Breaks to levels lower than objectives in MFWP's management plans.
- Manage the landscape with pyric herbivory (patch burning) to restore historical fire-return intervals and the fire-grazing interaction including concentrated herbivory coupled with long periods of abandonment to increase the amount and diversity of palatable plants to reduce selectivity for sentinel species.
- Evaluate the success of habitat treatments—the population viability of all species and the structural heterogeneity of the landscape—using methods developed by universities, NRCS, the Service, or other scientists. Focus on viability analysis of sentinel plant species populations at permanent trend sites.
- As HMPs for prescriptive grazing are developed, conduct fence projects based on defined priorities to achieve removal of interior fences on about 10–25 percent of the refuge and construction of boundary fences where absent. Use practical fencing strategies in cooperation with other landowners in areas where topography is too rugged. Hire seasonal employees for fence removal and professional fence builders for boundary fence construction; the remaining boundary fences are located in the most difficult terrain.
- Implement prescriptive grazing across the refuge through the development and implementation of

HMPs by working with BLM, DNRC, conservation districts, and permittees. Use prescriptive grazing only on Service-managed lands. Since it is possible that prescriptive grazing practices on Service lands may impact current permittees that graze BLM, DNRC and Service lands, work with the DNRC as budgets allow to mitigate any loss of revenue by assuming leases on these pastures. (Same strategy in alternatives C and D).

HABITAT—RIVER BOTTOM

River bottoms are areas above high pool of the lake exclusively on the west end of the refuge and within the original floodplain of the Missouri River. These areas consist of former agricultural fields that are now infested with invasive plants. There are 17 river bottoms totaling 5,000–7,000 acres on the west end of the refuge: 2 river bottoms are undergoing restoration, and the other 15 areas have about 4,500–6,000 acres that need removal of invasive plants (refer to figure 20 in chapter 4). The plant communities left on the river bottoms have now predominately been invaded by Russian knapweed, leafy spurge, smooth brome, and quackgrass, which have very little value to wildlife.

The Service is defining restoration of the river bottoms to be a healthy native plant community consisting of plants that would have occurred on the river bottoms 150 years ago. Climax river bottom communities include but are not limited to maximilian sunflower, diamond bark willow, sand bar willow, redosier dogwood, green ash, cottonwoods, and grasses.

Objectives for River Bottom Habitat, Alternative A

Refuge staff started restoring 160 acres of bottom lands in 2005, and an additional 160-acre project is planned to start in 2009 on the west end of the refuge.

River Bottom A1. Over 15 years, continue working with partners and pursuing outside funding to restore native plants to river bottoms.

Rationale for River Bottom A1. A healthy diverse native plant community in the river bottoms would enhance wildlife diversity and populations in addition to promoting biological diversity, ecological integrity, and environmental health. Healthy stands of native plants withstand or outcompete many nonnative species and create many more niches than that of monoculture food plots or invasive plants.

Restoring river bottoms with native species would allow these areas to perform their natural ecological function of trapping sediment during floods, which promote cottonwood regeneration. In addition, these native plants provide valuable wildlife habitat for numerous species. Vibrant native species would pro-



Maximilian Sunflower

mote resilience and resist invasive species invasions in the future.

Strategies for River Bottom A1

- Initiate five to seven small bottomland restoration projects over 15 years.
- Continue to restrict livestock from all bottomlands.

Objectives for River Bottom Habitat, Alternative B

River Bottom B1. Within 1–3 years, identify and rank according to priority and resource value all former farm fields on river bottoms that have been invaded by invasive plants for food plot potential. Develop a comprehensive plan that identifies methods and timeframes for completing each phase.

River Bottom B2. Within 2–4 years, work with NRCS and cooperators to develop treatment plans for each bottomland. The treatment plan will address equipment needs, grants and partnerships, and a farming plan. The plans will also identify types of food plots to be planted at each site to maximize game populations.

River Bottom B3. Within 3–5 years, begin implementing the approved management plan on the first river bottom on the priority list.

River Bottom B4. Over 15 years, complete a minimum of 30–40 percent of the identified projects for invasive plant removal. If time, personnel, and funding allows, start one new river bottom per year until all identified bottoms have a food plot present.

River Bottom B5. Over 15 years, continue to monitor and spot treat all invasive plants that may become established after removal of invasive plants is completed.

Rationale for River Bottom B1–B5. In alternative B, an aggressive approach to removal of invasive plants would be implemented. Work would include burning, discrete spraying with herbicides and planting with wildlife food crops to clear invasive plants (Anderson 1985). An herbicide such as Roundup® would be used initially to kill invasive grasses such as smooth brome and quackgrass. Following this, a broadleaf herbicide could be used if needed, unless invasive grasses encroached again. When the bottoms are treated and replanted to wildlife food crops, they would attract elk, deer, upland birds, and waterfowl. Wildlife numbers should increase with food plots and therefore, allowing for more hunting opportunities.

Strategies for River Bottom B1–B5

- Plant the lower priority bottoms to nongenetically modified organism alfalfa or grain crops to remove invasive plants and provide wildlife value.

- Continue restricting domestic livestock grazing from the river bottoms.
- Continue to seek partnerships for projects already in progress to remove invasive plants in river bottoms.
- Continue to seek outside funding opportunities such as grants from The Rocky Mountain Elk Foundation and other cooperators to secure necessary funding to acquire equipment and supplies needed.
- Hire a grant writer to pursue additional funding avenues to secure funding for weed removal projects.
- Clean former river bottoms through the application of herbicides and farming. If funding permits hire a biological technician who is knowledgeable in planting crops to start work on the first river bottom on the priority list.
- Work with NRCS and cooperators using knowledge gained in prior projects and experiences to establish methods of operation.
- Coordinate work with the road maintenance staff to fix roads necessary to safely access river bottoms (some areas would have to be accessed by foot or horse).
- Initially burn areas to be planted and have the Service's weed strike team spray invasive plants. Plant areas with wildlife food crops to clear invasive plants. Native plantings could follow after invasive plants have been removed to meet national and regional priorities.
- Over 15 years, continue to monitor and spot treat all invasive plants that may become established.

Objectives for River Bottom Habitat, Alternative C

River Bottom C1. By year 4–6, identify all river bottoms in need of invasive plant removal and develop plans for each. Include use of cooperative farmers to complete invasive plant removal work using a variety of methods including seeding of native plants and possible nongenetically modified organism crops such as alfalfa or other cereal grain (Roundup® could be used initially to treat area prior to planting).

River Bottom C2. Over 15 years, complete 50–60 percent of the identified projects for invasive plant removal. These areas would be restored to healthy native plant communities that are essential for wildlife habitat and resistance to invasive plant invasions (Colorado State Parks 1998).

Rationale for River Bottom C1–C2. In alternative C, the Service would rely on partnerships with cooperative farmers to restore the river bottoms. The use of cooperative farmers would allow the Service to treat more areas in less time and with fewer refuge resources.

Cooperative farmers have the necessary equipment and knowledge. Initially, there could be a short-term increase in the use of chemicals like Roundup® to kill invasive grasses like smooth brome or quackgrass, but this would soon be eliminated so plants would not build up a resistance to it. Other herbicides like Milestone™ would be used for spot spraying. Only non-genetically modified organism crops would be allowed for planting due to the likelihood of weeds becoming resistant to treatment. The number of weed removal projects would depend on the number of local farms interested in entering into cooperative farming contracts with the refuge.

The refuge would reinstate farming on river bottoms for up to 15 years so local individuals could get an economic benefit from the crops produced while weed seeds were eliminated. A contract inspector would be hired to discuss options with contractors and ensure that the terms of the special use permit were being followed.

Wildlife and people would benefit from the reduction in invasive plants and the eventual return of a healthy native plant community.

Strategies for River Bottom C1–C2

- Continue restricting domestic livestock grazing from the river bottoms.
- Continue invasive plant removal of river bottoms already in progress.
- Solicit interested parties to farm river bottoms in need of invasive plant removal, and if funding permits hire a biological technician knowledgeable in invasive plant removal work to oversee all removal of these plants in river bottoms.
- After invasive plant removal plans are developed, solicit and identify individuals and cooperators interested in farming the river bottoms in need of invasive plant removal and develop cooperative farming contracts. Contracts would contain acceptable methods to be used for invasive plant removal of river bottoms (for example, area to be plowed on each individually identified river bottom, herbicides acceptable for use, crops that can be planted, invasive plant reduction necessary, time tables for replanting native seed mixtures, and penalties to be incurred if the contract is not fulfilled).
- Identify the native plant mixture to be planted at the end of the contract and use penalties if the contractor defaults on the contract.
- Road maintenance and repair of access roads to river bottom would occur as needed. Some of these roads may be service roads only.
- On the third year, contract holders would begin reducing the invasive plants present by spraying and/or plowing predetermined areas, and

plant them with mutually agreed on crops (crops produced would be the property of the contract holder to use as that person wishes, following compatibility determination).

- Use ecological site descriptions prepared by the NRCS as a baseline for determining grass and forb planting mixture, but modify as necessary to promote sustainable big game populations. All seed mixture would be purchased by the Service and planted by a contractor or cooperator.
- On contract completion, the Service would plant native shrubs and trees and protect the new plantings from browsing with exclosures until they are able to grow out of the browse zone.
- Over 15 years, monitor and spot treat all invasive plants that may become established.

Objectives for River Bottom Habitat, Alternative D

River Bottom D1. Similar to B1, except food plots would not be used for restoration, but work could be contracted.

River Bottom D2. Within 2–4 years, work with NRCS and cooperators to develop restoration plans for each bottomland necessary to implement the comprehensive restoration plan. Treatment plans would address equipment needs, farming plan, identify native plant composition mix for planting, and grants and partnerships.

River Bottom D3. Within 3–5 years, begin implementing the approved restoration plan on the first river bottom on the priority list.

River Bottom D4. Over 15 years, develop and implement a habitat-monitoring plan to determine success of invasive plant removal efforts. Make adjustments to ensure successful native plant restoration.

River Bottom D5. Over 15 years, complete 20–30 percent of the identified restoration projects (more if funding is available). If time, personnel and funding allows, start one new river bottom project every 2 years until all are restored to healthy native plant communities.

Rationale for River Bottom D1–D5. In alternative D, the approach to removal of invasive plants in river bottoms would be slightly less aggressive than alternative B and would be more gradually implemented. This is due to the expense and time needed to establish native plants.

Native plant communities that once existed on these bottoms have been unable to reestablish themselves. This is most likely due to a lack of a viable seed source and competition from nonnative species.

Once established, the correct combination of native forbs, shrubs and grasses, such as maximilian sunflower, wild licorice, basin, wildrye, green needle-

grass, redosier dogwood, and silver buffaloberry would be highly competitive with these invaders (Riley and Wilkinson 2007). NRCS' ecological site description has a complete list of native plants that most likely occurred on these sites (NRCS 2009).

Refuge staff would continue to consult with NRCS range specialists and design a restoration program that includes prescribed fire, herbicide application, tilling and native seed planting.

Strategies for River Bottom D1–D5. Similar to B, except:

- When native forbs and grasses are reestablished, plant native shrubs in the fields and protect them from browsing by total exclosures until they are able to grow out of the browse zone. Water shrubs and trees four to six times during the first summer they are planted.

HABITAT–RIPARIAN AREA and WETLAND

Riparian habitat areas include wetland and upland vegetation associated with rivers, streams, and other drainage ways. Riparian and wetland areas provide important habitat for a variety of wildlife species, ranging from reptiles and amphibians to upland mammals and many birds. While riparian areas occupy a small proportion of the landscape, wildlife and livestock depend on these areas more than any other habitat type (Kaufman and Krueger 1984, Mosconi and Hutto 1982, Johnson et al. 1977, Ames 1977). The ability of a riparian site and its associated stream reach to perform normal riparian functions determines the health of the site. Other important functions of riparian vegetation include sediment filtering, stream bank stabilization, water storage and aquifer recharge, and dissipation of stream flows (Hansen et al. 1995). Considering the importance of riparian areas, the alternatives would be very similar in emphasizing maintenance or restoration of healthy riparian zones.

Objectives for Riparian Area and Wetland Habitat, Alternative A

Alternative A would continue managing riparian areas according to actions or directions set in the 1986 EIS even though many have already been implemented.

Riparian Area and Wetland A1. Over 15 years, continue managing migratory bird habitats (riparian areas) first for production and then for use during migration.

Riparian Area and Wetland A2. Over 15 years, continue improving and maintaining riparian habitat on the Missouri and Musselshell Rivers and other suitable riparian areas in good to excellent condition to benefit wildlife species such as elk, white-tailed deer, raccoons, beaver, waterfowl, kingbirds, mourning doves, American kestrels, ring-necked pheasants, and turkeys.

Rationale for Riparian Area and Wetland A1–A2. Keeping with the priorities and direction set by the 1986 record of decision through the HMPs, livestock grazing would be managed to promote waterfowl habitat in good or excellent condition. Livestock ponds would be maintained, and new ones constructed.

Fencing would be used to exclude livestock from the vast majority of the riparian habitats along the Missouri and Musselshell Rivers. Livestock has been excluded by fencing in a few other important riparian areas (for example, Rock Creek in Phillips County and Bobcat Creek in McCone County). Through changes in ranch ownership, management changes, and other factors, livestock grazing has been reduced or eliminated from several other habitat units and conditions in these riparian habitats are improving.

A contractor was hired in 1995–7 to evaluate riparian conditions and was hired for the 2009 season to re-evaluate current riparian conditions and function and compare to previous surveys. Another contractor was hired to monitor effects of the exclosure on Rock Creek (refer to Chapter 4–Affected Environment). Restoration practices such as shrub and tree plantings were initiated in Rock Creek/Bug Creek Habitat Unit, Hawley Creek and Telegraph Creek areas. A local group of farmers and ranchers along the Lower Musselshell River hired the same contractor to design a riparian monitoring plan and gather baseline data from Mosby to the refuge at Fort Peck Reservoir. Additionally, USGS conducted a 5-year study to gage streams on the refuge (Sando et al. 2009). Montana Department of Environmental Quality conducted water quality sampling on the refuge in 2006–2007 (refer to Chapter 4–Affected Environment).

Strategies for Riparian Area and Wetland A1–A2. None.

Objectives for Riparian Area and Wetland Habitat, Alternative B

Riparian Area and Wetland B1. Within 2–4 years, implement management actions to improve health of those streams identified as in poor condition based on the survey that was conducted in 2009 by Hansen.

(Same as Riparian Area and Wetland C1 and D1).

Riparian Area and Wetland B2. Over 15 years, remove all reservoir and stock ponds that do not support species of concern (for example, northern redbelly dace and finescale dace) and adhering to any permit requirements, initiate restoration of the natural hydrology of the drainage. Determine if additional stock ponds are needed to meet requirements of target species.

(Same as Riparian Area and Wetland D2).

Riparian Area and Wetland B3. Within 4–6 years, those reservoirs and stock ponds that cannot be removed

due to species of concern should be maintained or improved for amphibian, reptile, bird, or fish use.

(Same as Riparian Area and Wetland D3).

Riparian Area and Wetland B4. Over 15 years, survey the current health of a representative sample of segments of the Missouri River using the “U.S. Lotic Wetland Health Assessment for Large River Systems” (Ecological Solutions Group 2010).

(Same as Riparian Area and Wetland C5 and D4).

Riparian Area and Wetland B5. Within 5–7 years, re-survey the current health of segments previously surveyed on the Musselshell River (Riparian Wetland and Research Program 2001) using the “U.S. Lotic Wetland Health Assessment for Large River Systems” (Ecological Solutions Group 2010).

(Same as Riparian Area and Wetland C6 and D5).

Riparian Area and Wetland B6. Over 15 years, construct wildlife-friendly fence based on highest need as determined by current river health assessments along Missouri and Musselshell Rivers where prescriptive livestock grazing will be occurring (Paige 2008).

(Same as Riparian Area and Wetland C7 and D6).

Riparian Area and Wetland B7. Over 15 years, identify locations along riverbanks in need of stabilization and revegetation and restore 50 percent of those locations. Adhere to all regulatory permitting requirements.

Riparian Area and Wetland B8. Within 7-10 years describe the habitat requirement of the target species and implement habitat and population monitoring protocol on 25–50 percent of the river. Over 15 years, further develop the program on 50–75 percent of the refuge.

Rationale for Riparian Area and Wetland B1–B8. The first priority for riparian restoration would be those sites already found to be nonfunctioning as identified by the latest riparian study completed in the summer of 2009 (Hansen 2009).

Restoration measures would vary depending on the condition and trend of the riparian-wetland habitat. Considerations should include the potential of the site; desired plant community; stabilization of streambanks and elimination of bank hoof shearing; value of site for forage production, and amount of vegetation stubble required to trap and hold sediment deposits during run-off events. For instance, if one of the objectives for a riparian-wetland area is stream bank stability, then woody vegetation vitality should be of utmost importance due to the vastly different stream bank stability protection afforded by the woody vegetation when compared to the herbaceous vegetation (Hansen 1992). Also to be considered are water quality and quantity issues, wildlife, aesthetic values, amount of time for restoration, and

reduction of erosion and maintenance of soil production (Hansen 1992).

Key species vary with the potential of each site. The Riparian and Wetland Research Program developed the key to riparian and wetland sites of the refuge (1996). This reference should be utilized whenever possible. Willows and other large woody vegetation (such as trees) filter large water borne organic material and their root systems provide streambank stabilization. Sedges, rushes, grasses, and forbs capture and filter out the finer materials while their root masses help stabilize streambanks and colonize filtered sediments (Hansen 1992).

The objectives and strategies recognize the habitat value of stock ponds. Phytoplankton (algae) is consumed by zooplankton, insects, crustacean, and tadpoles that live in ponds. Larger invertebrates, amphibians, reptiles, fish and birds also will utilize a stock pond. (NRCS 2005).

Fencing would be used to exclude livestock from the vast majority of the riparian habitats along the Missouri and Musselshell Rivers. Livestock has been excluded by fencing in a few other important riparian areas (for example, Rock Creek in Phillips County and Bobcat Creek in McCone County). Through changes in ranch ownership, management changes and other factors, livestock grazing has been reduced or eliminated from several other habitat units and conditions in these riparian habitats are improving.

Strategies for Riparian Area and Wetland B1–B8

- Contract with a qualified riparian habitat consultant to resurvey riparian areas surveyed by Cook et al. (1996), Parker and Hansen (1996), Thompson and Hansen 1996 and 1997, Lower Musselshell River (2001), and Ecological Solutions Group (2009) to determine current health.
- Prioritize stream restoration using Thompson and Hansen 1999 (functioning versus nonfunctioning streams) and USGS gauge information; establish more permanent stream gauging stations on refuge; identify species of concern that are being affected by nonfunctioning streams; and identify dams on private and BLM land off refuge that have the ability to influence stream health on the refuge; Define realistic and attainable management objectives for the site or stream reach.
- Prioritize stream restoration based on water rights and/or the ability to influence stream health.
- Locate key areas for monitoring in representative portions of the riparian-wetland areas as well as in the uplands.
- Determine the amount of vegetation stubble required to trap and hold sediment deposits dur-

ing run-off events to rebuild stream banks and restore and recharge aquifers.

- Reestablish vegetation along stream banks using willow cuttings, tree revetments, perennial grasses or other stream bank stabilization planting techniques.
- Restore the refuge prairie streams by using enclosures in riparian areas, prescriptive livestock management; rehabilitating stock reservoirs that are no longer needed, and planting of riparian species, placing salt and mineral blocks, establishing or improving off-stream watering sites, installing stable access points to limit streambank trampling, requiring permittees to use riders to keep herds out of riparian areas, considering different turn-in locations, placing in-stream structures such as boulders to increase the water tables (Fitch and Adams 1998, Leonard et al. 1997, Kaufman and Krueger 1984, Ehrhart and Hansen 1997, Wyman et al. 2006).
- Restore beaver colonization of perennial and intermittent streams.
- Seasonally restrict livestock access to wetlands or limit duration and intensity of use; establish water troughs with escape ramps (troughs shouldn't be placed in locations that lead to unacceptable impacts to important upland habitats (Pilliod and Wind 2008). When livestock have to cross a stream, then a bridge, water-gap, or a streambed crossing should be constructed.
- Encourage livestock to move away from the stream through several methods such as conducting prescribed burns of uplands to regenerate desirable species or placing salt and supplemental feed in upland areas.
- Rangeland rest should be employed wherever and whenever possible.
- Incorporate applicable regulatory compliance (such as wetlands permitting) into stock pond removal efforts.
- Within stock ponds incorporate logs for amphibians and turtles to bask, egg-laying sites for fish, frogs, and salamanders, perches for birds.
- Provide a buffer of woody vegetation around a portion of constructed earthen livestock watering ponds.
- Design a monitoring plan that will evaluate the effectiveness of the management plan. Grazing management must be flexible enough to accommodate changes.
- Monitor vegetation community change in response to management actions by using the U.S. Lotic Wetland Inventory (current as of June 22, 2009) to record species canopy and habitat type or community type covers on a reach of stream and its

riparian zone. Quantify such vegetative variables as invasive plants, undesirable herbaceous species, and the structure and diversity of the plant community.

- Determine site potential, existing vegetation types and desired plant community or desired future condition. Continue to exclude livestock from riparian areas if possible.
- Follow Hoitsma Ecological, Inc.'s (2006) recommendations for future riparian efforts along Telegraph Creek as well as the refuge staff's restoration efforts from 1991–3 in Rock Creek/Bug Creek Habitat Unit, and Hawley Creek.
- Supervise frequently to avoid adverse effects such as trampling damage to stream banks and excessive use.

Objectives for Riparian Area and Wetland Habitat, Alternative C

Riparian Area and Wetland C1. Same as Riparian Area and Wetland B1 and D1.

Riparian Area and Wetland C2. Within 10 years, evaluate current stock ponds and determine which ponds need to be rehabilitated or eliminated and determine if additional ponds are needed to meet NRCS range conditions across the unit. Those reservoirs and stock ponds that cannot be removed due to species of concern should be maintained or improved for fishing or livestock use (see strategies, which include pond management).

Riparian Area and Wetland C3. Within 5 years, determine the potential of selected sites (for example, the riparian-wetland plant association) and desired plant community to stabilize stream banks and eliminate bank hoof shearing.

Riparian Area and Wetland C4. Over 15 years on priority streams, raise the elevation of the present water table; improve or maintain water quality and quantity; stabilize the stream banks; establish proper stream channels, stream banks, and floodplain conditions and functions.

Riparian Area and Wetland C5. Same as Riparian Area and Wetland B4 and D4.

Riparian Area and Wetland C6. Same as Riparian Area and Wetland B5 and D5.

Riparian Area and Wetland C7. Same as Riparian Area and Wetland B6 and D6.

Riparian Area and Wetland C8. Same as Riparian Area and Wetland D7.

Rationale for Riparian Area and Wetland C1–C8. Same as B, except under alternative C, management of riparian resources is geared toward maximizing livestock grazing and recreation while still maintaining a balance

with other needs and requirements. Service resources will be allocated with the priority on improving ponds for livestock and recreation, only indirectly benefiting wildlife. With those resources, additional ponds could be established utilizing pond management. Fewer resources under large river objectives would be available for revegetation, restoration, and monitoring. Also, no resources would go towards restoring natural hydrology of first-, second-, and third-order streams.

Historical grazing by large herds of bison and other ungulates included long periods of rest after intensive disturbance such as drought, fire, and grazing. Bison did not linger in riparian areas (Van Vuren 1981, Fuhlendorf et al. in press) and did not use an area all season long. Cattle spend a disproportionate amount of time in riparian areas (5–30 times longer) (Ehrhart and Hansen 1997).

Strategies for Riparian Area and Wetland C1–C8

Same as B, plus:

- Utilization monitored annually, but progress in reaching long-term resource objectives such as stream bank stabilization, rebuilding of the streamside aquifer, and the reestablishment of beaver or fish habitat can only be determined over a longer period. Targets would be developed for riparian-wetland areas that would:
 - maintain both herbaceous species and woody species (where present) in a healthy and vigorous state and promote their ability to reproduce and maintain different age classes in the desired riparian-wetland plant community
 - leave sufficient plant residue necessary to protect stream banks during run-off events and provide for adequate sediment filtering, and dissipation of flood water energy
 - are consistent with other resource values and objectives such as for aesthetics, water quality, water quantity, and wildlife populations.
 - limit stream bank shearing and trampling to acceptable levels.
- Stock ponds with predatory largemouth bass and prey species such as bluegill, yellow perch, golden shiners, or fathead minnows. Protect population for 5 years. Stocking rates are 100 2-inch largemouth bass per acre and 500 1-inch bluegill per acre (FWS 1994).
- Use techniques in “A Guide for Building and Managing Private Fish Ponds in Montana” (MFWP 2006a) to address water quantity and quality, watershed and soil analysis, design and construction including: contour, depth and water exchange, excavation, revegetation; stocking; and pond management.

Objectives for Riparian Area and Wetland Habitat, Alternative D

Riparian Area and Wetland D1. Same as Riparian and Wetland B1 and C1.

Riparian Area and Wetland D2–D3. Same as Riparian and Wetland B2–B3.

Riparian Area and Wetland D4. Same as Riparian and Wetland B4 and C5.

Riparian Area and Wetland D5. Same as Riparian and Wetland B5 and C6.

Riparian Area and Wetland D6. Same as Riparian and Wetland B6 and C7.

Riparian Area and Wetland D7. Over 15 years, provide alternate water sources for cattle where requiring prescriptive grazing to accomplish habitat objectives away from riparian areas and sensitive upland sites on a priority basis.

Riparian Area and Wetland D8. Over 15 years, identify locations along riverbanks in need of stabilization and revegetation, and restore 50–75 percent of those locations.

Riparian Area and Wetland D9. Over 15 years, restore natural hydrology of five first-, second-, and third-order streams that would normally flow into the Missouri and Musselshell Rivers.

Rationale and Strategies for Riparian Area and Wetland D1–D9 (*Same as B*)

HABITAT—SHORELINE

The shoreline is a highly dynamic area that fluctuates based on current lake level. Shoreline habitat is defined as the vegetation found between current lake level and high pool elevation. This habitat type is used during periods of drought.

Objectives for Shoreline Habitat, Alternative A

No objectives were developed for the 1986 EIS for Shoreline management. Currently, the Service does not manage the shoreline but does cooperate with USACE in their efforts to treat invasive species along the shoreline.

Shoreline A1. When completed, cooperate with USACE and others in implementing the Missouri River Ecosystem Restoration Plan, which is currently being developed in addressing habitat needs for threatened and endangered species and other species along the shoreline.

(Same as Shoreline B1, C1, and D1).



Dave Menke/USFWS

The spotted sandpiper uses shoreline habitat.

Rationale for Shoreline A1. The USACE has primary jurisdiction for management of the lakeshore areas including treating saltcedar infestations; therefore, the refuge does not take the lead role in managing the shoreline. The Service would defer to the Missouri River Ecosystem Restoration Plan to guide management of this habitat and provide assistance as requested. The Service is working in cooperation with the USACE and other partners to develop the plan (USACE 2009b) to meet the habitat needs of various threatened and endangered species such as piping plover, least tern, and pallid sturgeon. Once this restoration plan is completed, refuge staff would cooperate to implement any recommendations that come out of the plan.

Continual water fluctuations and changes in shoreline exposure result in constant infestations of saltcedar along the exposed shoreline. The Service will continue to partner with the USACE in treating saltcedar both above and below the high water line. The invasive species discussion below has additional details.

(Same as B, C, and D).

Strategies for Shoreline A1 (None)

Objectives for Shoreline Habitat, Alternative B

Shoreline B1. Same as Shoreline A1, C1, and D1.

Shoreline B2. Over 15 years, continue to cooperate with USACE and other partners—such as nongovernmental organizations, neighboring counties, and the State of Montana—in treating a minimum of 200 acres of invasive plant species per year that colonize Fort Peck Reservoir and the Missouri River shorelines.

(Same as Shoreline A2, C2, and D2).

Rationale for Shoreline B1–B2. The actions would be similar to alternative A, but there would be more emphasis on being aggressive with treating invasive species.

Strategies for Shoreline B1–B2

- Maintain water gap structures as the shoreline recedes.
- Coordinate invasive plant control by meeting and cooperating with USACE and other partners to share information and discuss control strategies.
- Use integrated pest management and review literature for updated information on control techniques.
- Map all treatment sites.
- Monitor and re-treat areas to prevent reinfestation.
- Restore bare areas resulting from saltcedar removal to native plant cover and monitor results.
- Obtain assistance with invasive plant control and monitoring by pursuing additional funds through partnerships, grants, and invasive species programs.
- Deploy early detection and rapid response strategies to attack newly found infestations before they become large and costly initiatives.
- Within 1 year, invite all parties that have an interest in invasive plant control to pool resources and coordinate efforts at control and restoration methods.
- Over 15 years, when funds are available continue to contribute to USACE efforts at saltcedar control and cottonwood restoration.
- Over 15 years, continue to assist USACE with historical plover and tern surveys so that the survey data remains consistent.

Objectives for Shoreline Habitat, Alternative C

Shoreline C1. Same as Shoreline A1, B1, and D1.

Shoreline C2. As funding permits, cooperate with any potential partners—such as USACE, nongovernmental organizations, neighboring counties, and the State of Montana—in treating a minimum of 250 acres of invasive plant species per year that colonize Fort Peck Reservoir and Missouri River shorelines.

Rationale for Shoreline C1–C2. Same as A, except the Service would work with others to treat more areas of the shoreline.

Strategies for Shoreline C1–C2 (Same as B)

Objectives for Shoreline Habitat, Alternative D

Shoreline D1. Same as Shoreline A1, B1, and C1.

Shoreline D2. Same as Shoreline B2.

Rationale and Strategies for Shoreline D1–D2 (Same as B)

HABITAT–FIRE MANAGEMENT

Fire management and habitat management are inseparable, thus objectives for prescribed fire and wildfire were developed to support the achievement of habitat objectives for the four vegetation categories—uplands, river bottoms, riparian areas and wetlands, and shorelines.

The terms and concepts for wildfire—prescribed fire and wildfire—are based on Federal interagency policy (Fire Executive Council 2009). Wildfire is any nonstructure fire that occurs in the wildland including prescribed fire. Response to wildfire is based on consideration of a full range of fire management actions—allowing the fire to benefit the resource where possible or taking suppression action when those benefits are not attainable or there is a likely risk to important resources or adjacent lands. Fire management actions may include controlling the fire's perimeter, protecting a specific area with highly valued resources, and monitoring fire conditions and activity.

Prescribed Fire

A prescribed fire is any fire ignited by management actions to meet specific objectives. A prescribed fire is conducted under a project-specific prescription of requirements for conditions such as weather, fuel moisture, and soil moisture. The prescription is designed to confine the fire to a predetermined area and produce the intensity of heat and rate of spread required for the fuel consumption that would accomplish the objectives.

Objectives for Prescribed Fire, Alternative A

Prescribed Fire A1. Continue with the 1986 record of decision strategy of treating existing plant communities with prescribed fire to achieve desired habitat conditions.

Rationale for Prescribed Fire A1. Habitat analysis indicates some deciduous shrubs have diminished on the refuge, and historical accounts indicate shrubs were once more abundant than they are today. A combination of actions would be taken to improve the present situation; the actions in priority order would probably be adjustments in livestock grazing, burning, and planting.

Strategies for Prescribed Fire A1

- (From the 1986 EIS) Increase the quality and quantity of deciduous shrubs by prescribed burning 525 acres per year. Following burning or planting, allow no livestock grazing for 2–3 years or longer, if necessary, to ensure successful establishment of the desired vegetation.
- Implement a fire management program to provide for appropriate management response areas and prescribed burns to protect fragile habitats,

valuable coniferous areas, critical wildlife habitats, recreational developments, and other private and refuge developments.

Objectives for Prescribed Fire, Alternative B

Prescribed Fire B1. Within 2–4 years, revise the fire management plan.

Prescribed Fire B2. Within 5 years, determine priority units where prescribed fire would be used to meet the habitat needs of focal species or where needed to reduce hazard fuel.

(Same as Prescribed Fire D2.)

Prescribed Fire B3. Develop a patch-burning system using wildland fire to improve annually at least 2,500 acres of habitat suitable for target species. Additionally, reestablish natural fire regimes (fire occurs on average every 8–70 years) of nonfire refugia sites on about 30,000 acres using prescribed fire and wildfire managed for resource benefit.

(Same as Prescribed Fire D3.)

Prescribed Fire B4. Within 5–7 years, develop prescribed fire plans for the major habitat units.

Prescribed Fire B5. Within 1–2 years, work with the Ecological Services branch of the Service to identify what and how critical habitat for threatened and endangered species and species of concern would be adversely affected by prescribed fire and incorporate into fire management plan.

(Same as Prescribed Fire C4.)

Prescribed Fire B6. Over 15 years, use prescribed fire and wildfire managed for resource benefit to restore the natural ecological process of fire and to reduce by 5–10 percent the encroachment of ponderosa pine and Douglas-fir into the dry needlegrass-wheatgrass prairie.

(Same as Prescribed Fire C5 and D6.)

Prescribed Fire B7. Over 15 years, reduce 5 percent of hazard fuel on forested slopes, with an emphasis on protecting old-growth forests that have a fire-return interval of 75–100 years from catastrophic fire.

(Same as Prescribed Fire C6 and D7.)

Prescribed Fire B8. Over 15 years, establish partnerships with nongovernmental organizations, local governments, and private cooperators to identify and reduce 200–400 acres of hazard fuel in the wildland-urban interface.

(Same as Prescribed Fire D8.)

Rationale for Prescribed Fire B1–B8. See the rationale under uplands for alternative B about changes in the landscape since the demise of bison in 1881.

The Service has long recognized fire as a unique process that shapes wildlife habitat structure and function, and the agency has managed and used fire

extensively for the past 70 years. Guiding principles of fire management in the Service include responsible stewardship, habitat management strategies based on conserving ecological integrity, reducing hazardous fuels and establishing effective partnerships.

The emphasis of the refuge's fire management program has switched from strictly being suppression-oriented to a program that uses prescribed fire and wildfire as management tools to achieve habitat objectives and large, landscape-level change.

The sagebrush flats in UL Bend National Wildlife Refuge are critical nesting and wintering habitat for sage grouse. Wildfire in an area such as this could dramatically alter the habitat and result in severe impacts on associated wildlife. Within 1–2 years, refuge biologists would evaluate such areas and provide fire managers with a detailed map of the critical habitat to be protected, which would be taken into account in prescribed fire and wildfire plans.

There are large tracts of old-growth forest on the western half of the refuge that have not burned in the last 75–100 years (Douglas-fir and ponderosa pine). If a late-season, wind-driven wildfire were to occur in these areas, as has occurred throughout the central section of the refuge during the past decade, these old-growth forests would be practically eliminated, possibly forever. The refuge fire staff would evaluate these areas for possible reduction of hazard fuel and treat identified areas with prescribed fire or mechanical thinning, or both.

(Similar to C, with exceptions described under alternative C. Same as D.)

Strategies for Prescribed Fire B1–B8

- In cooperation with universities, partner scientists, and staff biologists, evaluate suitable areas for using prescribed fire as a habitat management tool to promote the abundance and viability of focal species.
- Enhance the fire organization with an increase of fire staff and prescribed fire competency: 2 prescribed fire burn bosses (type 1 and type 2), 15 prescribed fire seasonal employees, and 1 prescribed fire specialist (the seasonal employees and prescribed fire specialist would be additions to the current staff). These individuals would write burn plans and carry out an aggressive prescribed fire program. If increased funding through the fire program is not available, work to secure funding through the refuge program to hire the above fire staff. (Same as D.)
- Using research, fire-history data, and fire-scar evidence, conduct an inventory of sites that have exceeded average fire intervals. Set priorities for a burn rotation of hazard fuel in these areas, taking into account habitat and wildlife objectives. (Same as D.)
- Evaluate critical habitat areas across the refuge and provide the fire management officer with a detailed map of the critical habitat to be protected within 1 year of plan approval. (Same as C and D.)
- Evaluate old-growth forest areas that have a fire frequency of 75–100 years for possible fuel reduction and treat identified areas with fire or mechanical thinning. (Same as C and D.)
- Contract a fire planner to develop plans pertaining to the use of wildland fire that would cover all burnable acres on the refuge. (Same as C and D.)
- With the use of historical photos, aerial photos, GIS, and onsite evaluation, identify areas where conifer encroachment into grasslands has been the greatest. Manage these areas with fire or mechanical treatment. (Same as C and D.)
- Using the refuge's 2005 Hazardous Fuels Assessment and in cooperation with USACE and local cooperators and private landowners, carry out fuel reduction projects in wildland-urban interface areas including the Pines, Hell Creek, Rock Creek, and Nelson Creek recreation areas. Support communities in acquiring community assistance grants for mechanical treatment of wildland-urban interface areas. (Same as C and D.)

Objectives for Prescribed Fire, Alternative C

Prescribed Fire C1. Within 5 years, develop prescribed fire plans for habitat units with prescriptive livestock grazing to implement pyric-herbivory management for sentinel plants.

Prescribed Fire C2. Within 15 years, initiate a prescribed fire program in habitat units where vegetation palatability and composition has been identified as fair to poor or where there are large amounts of hazard fuel, or both, to improve range health and increase use of plant biomass by grazing ungulates.

Prescribed Fire C3. Over 15 years, work with partners and cooperators to reduce the risk of wildfire and negative economic effects to permittees by reducing fuel loading in habitat units through a combination of prescriptive livestock grazing and prescribed fire. Strike a balance between the needs of wildlife and improved forage for livestock.

Prescribed Fire C4. Same as Prescribed Fire B5.

Prescribed Fire C5. Same as Prescribed Fire B6 and D6.

Prescribed Fire C6. Same as Prescribed Fire B7 and D7.

Rationale for Prescribed Fire C1–C6. Similar to rationale for B, except there is more emphasis given to the economic effects of burning large units and units with active livestock grazing systems. Pastures without permit holders or where the permittee has taken voluntary nonuse would be the primary criteria for selecting prescribed fire units.

Strategies for Prescribed Fire C1–C6. Four strategies noted under B, plus:

- In cooperation with universities, partner scientists, and staff biologists, evaluate declining rangelands for the feasibility of using prescribed fire as a habitat management tool to improve range conditions and increase the use of plant biomass by grazing ungulates.
- Enhance the fire organization with an increase of fire staff and prescribed fire competency: 2 prescribed fire burn bosses (type 2) and 5 prescribed fire seasonal employees (additions to the current staff). These individuals would write burn plans and carry out a prescribed fire program.
- Within 5 years, contract with private vendors for 2,000 acres of mechanical fuels reduction in old-growth forests that are prone to a fire frequency of 70–150 years, with emphasis on habitat units that have the highest risk of loss to catastrophic wildfire.

Objectives for Prescribed Fire, Alternative D

Prescribed Fire D2. Same as Prescribed Fire B1.

Prescribed Fire D2. Within 5 years, identify priority habitat units where sentinel plant species have declined due to lack of fire or too much fire, and develop burn plans to apply prescribed fire in those areas.

Prescribed Fire D3. Same as Prescribed Fire B3.

Prescribed Fire D4. Within 2 years, identify critical habitat for threatened and endangered species and species of concern that could be adversely affected by fire; in addition, use prescribed fire in conjunction with research to determine if there would be any negative effects on species or critical habitat.

Prescribed Fire D5. Same as Prescribed Fire B5.

Prescribed Fire D6. Same as Prescribed Fire B6 and C5.

Prescribed Fire D7. Same as Prescribed Fire B7 and C6.

Prescribed Fire D8. Same as Prescribed Fire B8.

Rationale for Prescribed Fire D1–D8 (Same as B)

Strategies for Prescribed Fire D1–D8

Similar to B, except:

- Manage the landscape with a coordinated program of prescribed fire (patch burns) and livestock grazing to restore historical fire-return intervals and the fire-grazing interaction. This includes concentrated herbivory (grazing and fire) coupled with long periods of abandonment and reduced selectivity for important sentinel species (species that disappear first).
- In cooperation with universities, partner scientists, and staff biologists, evaluate areas with declining sentinel plant species due to lack of fire for the feasibility of using prescribed fire as a habitat management tool to promote the abundance and viability of sentinel plant species.
- Use prescribed fire to establish a semi-natural mosaic of burned patches that would (1) reestablish a more natural fire-browsing-grazing interaction; (2) promote long-distance animal movement; (3) cause long periods of abandonment from grazing and browsing ungulates; (4) reduce the selectivity for sentinel species by all ungulates; and (5) increase landscape species and structural heterogeneity.



USFWS

A small, low-intensity prescribed fire in 2008.

Wildfire

A wildfire is an unplanned ignition such as a fire started by lightning or an unauthorized or accidental fire started by humans. The response to a natural ignition fire is based on an evaluation of risks to firefighter and public safety and the circumstances under which a fire occurs including weather and fuel conditions, natural and cultural resource management objectives, values to be protected, and protection priorities.

Objectives for Wildfire, Alternative A

Wildfire A1. Within 15 years, revise the fire management plan and carry out a fire program that provides for a response strategy for wildfire with the primary objective of protecting fragile habitats, valuable coniferous areas, critical wildlife habitats, recreational developments, and other private and refuge developments consistent with resource objectives.

Rationale for Wildfire A1. Wildfire is a natural component of a healthy ecosystem. The Service has long recognized the many ecological benefits of fire in restoring, maintaining, and enhancing refuge lands. Keeping this capability is critical to the Service mission because most Service lands, including the refuge, evolved with fire as a natural disturbance. Not all wildfires are detrimental, nor should they be suppressed at all costs. It is important to evaluate wildfires for opportunities to use modified suppression tactics to promote natural processes.

Strategies for Wildfire A1

- Evaluate each wildfire to determine the safest and most economical and beneficial manner for suppression. This strategy may entail allowing a fire to burn toward natural barriers such as the river, lake, or bare clay ridges, while taking full suppression action on other areas of the fire (FWS 2004). In addition, this strategy may result in a larger fire but could provide resource benefits.
- Aggressively suppress that portion of any fire that threatens to burn off the refuge unless there is an agreement in place to do otherwise.

Objectives for Wildfire, Alternative B

Wildfire B1. Within 2–4 years, revise the fire management plan using the most current information. Incorporate a full spectrum of fire management actions for response to wildfire—knowing that managing fire is a dynamic process—including management of wildfire for resource benefit.

(Same as Wildfire D1.)

Wildfire B2. Within 10 years, develop maps to identify areas with the highest potential of success for reestablishment of fire on the landscape, using available scientific data on natural fire intervals, prescribed fire plans, and recent fire data.

Wildfire B3. Within 5 years, identify the locations with the highest valued resources, such as houses or wellheads, and ensure those values are not lost. Additionally, develop databases with maps that are readily available for managers to use in making sound decisions.

(Same as Wildfire C3 and D3.)

Wildfire B4. Within 5 years, identify areas where perimeter control is needed to preserve public safety and to protect both natural and human-made values at risk. Categorize these as hazard-fuel reduction areas, which would protect them as high-value resources (often called point protection).

(Same as Wildfire C4 and D4.)

Wildfire B5. After revision of the fire management plan, carry out appropriate fire management actions on natural ignition fires on the north side of the Missouri River. Control the fire perimeter for fires south of the Missouri River and in wildland-urban interface areas, both of which would be the highest priority for hazard fuel reduction.

(Same as Wildfire D5.)

Wildfire B6. Within 2 years, update and execute cooperative agreements with neighboring agencies—BLM, DNRC, the six counties, nongovernmental organizations, and neighboring landowners—for consideration of all fire management options when determining the management response to wildfires.

(Same as Wildfire D6.)

Wildfire B7. Within 1 year, identify areas of critical habitat for endangered species and/or species of concern that would be adversely impacted by fire. Fully suppress fires in these areas.

(Same as Wildfire D7.)

Rationale for Wildfire B1–B7. Consideration of the full spectrum of management response to wildfire does not replace, supersede, or give emphasis to any one particular strategy or tactic. Instead, the Service would consider all available strategies and tactics to determine a calculated response based on the circumstances of a particular fire at a particular time with particular characteristics. There is often more than one way to respond to a set of circumstances. (Northern Rockies Coordinating Group 2008).

Practices such as the following give the refuge the tools needed to manage wildfire for achieving multiple objectives. Fire has a role in maintaining the characteristics of an ecosystem (The WILD Foundation 2006) and in sustaining species. Sentinel plants and fire-return intervals have been studied on the refuge, showing that both have been interrupted by human activity (Frost 2008). Using the appropriate fire management actions to manage wildfire would help return natural processes to the Missouri River Breaks ecosystem. Wildfire management in concert

with a monitoring program and aggressive use of prescribed fire would ensure protection of areas of higher fire-return intervals.

The Service would use intensive suppression strategies where perimeter areas are threatening to burn off the refuge. While not all of the refuge's neighbors and cooperators share the Service's vision for wildfire, the refuge staff would continue to explore opportunities to incorporate the full range of fire management strategies on lands adjacent to the refuge where there is no mutual agreement between the Service and landowner.

Strategies for Wildfire B1–B7

- Take necessary actions, according to an approved fire management plan, to maintain above all else public and firefighter safety. (Same as C and D.)
- Using historical fire frequency data, evaluate the full range of fire management options and apply appropriate actions to use wildfire as a naturally occurring component of the patch burn program, in adherence with an approved fire management plan. (Same as D.)
- Monitor the effects of fire on habitat and wildlife populations. (Same as D.)
- Use natural wildfire occurrence within the scope of a full range of fire management options and an approved fire management plan to improve, enhance, and restore native wildlife habitat. (Same as D.)
- Over 15 years, increase public awareness in surrounding communities and refuge users about the full range of fire management options and how the Service evaluates and identifies strategies to manage wildfires along with prescribed fire to increase sentinel plants and reduce catastrophic wildfire risk. (Same as D.)
- Over 15 years, monitor the response of sentinel plants to both wildfire and prescribed fire; adjust fire management as needed to meet habitat objectives. Use monitoring data to update map databases and fire information for future planning. (Same as D.)

Objectives for Wildfire, Alternative C

Wildfire C1. Within 5 years, revise the fire management plan to retain, improve, or expand the refuge's capabilities to protect refuge resources and assist in local fire management.

Wildfire C2. Over 15 years, manage wildfires to aggressively suppress to the smallest acreage in the most cost-effective manner.

Wildfire C3–C4. Same as Wildfire B3–B4 and D3–D4.

Wildfire C5. Within 2 years, review, update, and execute cooperative agreements with BLM, DNRC, the

six counties, and nongovernmental organizations. Conduct an annual meeting to discuss the capabilities of each partner.

Rationale for Wildfire C1–C5. Although wildfire is a natural function in the refuge's ecosystems, it can also be the biggest threat to those ecosystems. Natural fire regimes have been altered extensively on the refuge and have been replaced by frequent, large, and intense wildfires. This alteration is due to humans. A subsequent effect has been the infestation of invasive plants such as cheatgrass, which cures earlier in the year than native bunchgrasses and can lengthen the fire season.

An effective fire management plan is crucial to the long-term conservation of refuge resources and protection of private property. The existing plan would require revision. Wildfires on the refuge could potentially have adverse economic, habitat, and resource effects that could threaten life, property, and sensitive resources. Having adequate resources to contain and extinguish large fires is critical to the long-term preservation of natural, cultural, and recreational resources.

Strategies for Wildfire C1–C5

- Aggressively respond to wildfire by using the full range of suppression resources to keep fires at the smallest acreage possible and have at least 97 percent of the fires controlled within 24 hours of reported ignition. Use whatever means possible—such as heavy air tankers (retardant), single-engine air tankers (retardant, foam, or water), aviation personnel, smokejumpers, and hand crews—to ensure fires do not escape initial attack.
- Within 5 years, increase permanent and seasonal firefighting personnel by 50 percent.
- Within 5 years, increase the Sand Creek fire cache of firefighting equipment to an amount sufficient for the staff to respond to at least two major fires per year.
- Within 10 years, build fire caches at the Jordan and Fort Peck field stations to house fire engines and firefighting equipment sufficient to respond to suppression needs.
- Over 15 years, upgrade the fleet of fire engines by adding at least one new engine every 5–7 years to replace old engines, and add one additional engine.

Objectives for Wildfire, Alternative D

Wildfire D1. Same as Wildfire B1.

Wildfire D2. After revision of the fire management plan, evaluate a full range of fire management options and carry out appropriate actions on natural ignition fires on the north side of the Missouri River. Within

5–7 years, evaluate the suitability of various fire management options to consider for all ignitions within the refuge boundary.

Wildfire D3–D4. Same as Wildfire B3–B4 and C3–C4.

Wildfire D5–D7. Same as Wildfire B5–B7.

Rationale for Wildfire D1–D7 (Same as B)

Strategies for Wildfire D1–D7

Same as B, plus:

- Within 5 years, increase staff qualifications to include a fire use manager, field observer, and incident commander. Increase fire staff to include 5–7 new permanent employees and 50–60 percent more seasonals (based on 2009 personnel).
- Within 5–7 years, contract the development of a GIS overlay of the refuge for use in producing fire management strategies for each habitat unit.
- Within 3–5 years, work with cooperators to fully coordinate the determination of management responses to wildfires using historical fire occurrence data to delineate areas that may be appropriate for each of the various fire management options.

HABITAT–INVASIVE SPECIES

Invasive species objectives include both woody and nonwoody invasive plants and aquatic invasives such as zebra mussels.

Objectives for Invasive Species, Alternative A

Invasive Species A1. Over 15 years, maintain the existing invasive species control program including mapping, use of biocontrol and chemical spraying, weed wash stations, and requiring horse users to use weed-seed-free hay.

(Same as Invasive Species B1, C1, and D1.)

Rationale for Invasive Species A1. Invasive species such as Russian knapweed, spotted knapweed, leafy spurge, saltcedar and other species are increasing on refuge due to spread from illegal off-road vehicle use, infestations from upstream sites, and changes in lake levels that expose bare lakeshore areas. In 2008, about 1,431 upland acres (excludes saltcedar below high water mark) of undesirable plant species were mapped on the refuges.

The Service has been treating new infestations, working with partners on treating high public use areas, sponsoring weed wash stations, promoting education of users on identifying weeds and exploring other ways to reduce their spread. The Service would continue to work with partners to improve overall habitat conditions across the refuge. Healthy ecosystems with a diversity of native plants are resilient to new infestations of invasive species (Kennedy et al. 2002).

Long-term control requires the cooperation of public and private land managers throughout the

area. A joint effort by all partners is needed to conduct research on finding the best management practices to control or eliminate individual species.

Strategies for Invasive Species A1 (None)

Objectives for Invasive Species, Alternative B

Invasive Species B1. Same as Invasive Species A1, C1, and D1.

Invasive Species B2. Within 1–3 years, develop an integrated pest management plan (step-down plan) for control of invasive plants, including invasive plants.

(Same as Invasive Species C2 and D2.)

Invasive Species B3. Within 5–7 years, map current infestations, and develop a strategy to achieve a 25-percent reduction in acres affected by noxious non-woody plants.

(Same as Invasive Species C3 and D3.)

Invasive Species B4. Over 15 years, achieve a 25–50 percent reduction in acres affected by noxious non-woody plants.

(Same as Invasive Species C4 and D4.)

Invasive Species B5. Within 5–7 years, target further encroachment of invasive woody plants (such as saltcedar and Russian olive) on Fort Peck lakeshores and bays.

(Same as Invasive Species C5 and D5.)

Invasive Species B6. Within 5 years and with adequate funding, reduce the occurrence of invasive, woody plants in riparian areas—primarily the Missouri and Musselshell River corridors above the full-pool elevation by 10–25 percent.

(Same as Invasive Species C6 and D6.)

Invasive Species B7. Over 15 years, measure trends of invasive species not classified as noxious (including Japanese brome, sweetclover, and cheatgrass). Implement adaptive management as appropriate.

(Same as Invasive Species C7 and D7.)



Saltcedar is the most prolific invasive species found on the refuge.

Invasive Species B8. Over 15 years, work with partners to increase public awareness of invasive plants on the refuge and surrounding lands by establishing an improved, coordinated signage system at major entrance points.

(Same as Invasive Species C8 and D8.)

Invasive Species B9. Continue current educational and monitoring efforts in cooperation with MFWP and USACE (same as Invasive Species C9 and D9). Prevent further spread of aquatic invasive species through 2027.

Rationale for Invasive Species B1–B9. Shrub-steppe grassland mosaic areas throughout western North America continue to decline in quantity and quality due in part invasion by exotic plant species (Samson and Knopf 1994, Bragg and Steuter 1995). River bottoms, lakeshore, and now the refuge uplands are experiencing an increase in invasive species. To date, only a small portion of the uplands has been mapped for invasive species and numerous acres could be infested. Studies suggest that shrub-steppe, grassland-mosaic bird species favor areas dominated by native vegetation. These bird species include sentinel species such as grasshopper sparrow, Baird's sparrow, long-billed curlew, upland sandpiper, mountain plover, lazuli bunting, chestnut-collared longspur, burrowing owl, and greater sage-grouse (Lindmeier 1960, Fairfield 1968, Owens and Myres 1973, Maher 1974, Stewart 1975, Wilson and Belcher 1989, Kantrud and Higgins 1992, Dhol et al. 1994, Davis and Duncan 1999, Johnson and Igl (2001). The degradation of remaining grassland areas in the northern Great Plains is likely due to inadequate or improper management as a principle factor in declining populations of grassland bird species.

Monotypic stands of invasive or nonnative species not only have the ability to negatively affect biodiversity but they also alter the flow energy and nutrients in the ecosystem and reduce resilience of the system.

Strategies for Invasive Species B1–B9

- Continue work with partners to provide at least one weed wash station during the hunting season.
- Work with partners to explore options for boat washing stations.
- Continue to provide educational materials to all hunters contacted and develop additional outreach methods to educate various users of the threat of invasive species to wildlife habitat.
- Work with partners and assess traffic count data to prioritize areas for location of informational invasive species signage.
- Over 15 years, in cooperation with USACE, treat (200 Service lands plus additional acres by USACE) acres of saltcedar along the shoreline each year depending on funding by contractor and/or strike team members. Maintain native vegetation in treated areas.
- Emphasize efforts to test and introduce biological controls for saltcedar.
- Continue to work with Service's invasive species strike team, county weed boards, neighbors and conservation organizations to maintain and update mapping of weed infestation. Review and update the integrated pest management plan every 5 years.
- Employ hunters in weed monitoring efforts by encouraging them to use their GPS devices to mark infestation sites.
- Prepare annual progress reports or have meetings to share current treatment techniques and results. In annual updates, include information on what treatment protocols may or may not have been successful in achieving stated objectives and any future plans.
- Conduct inventories following the Service's invasive species strike team operational guidelines, when completed, which will include mapping criteria.
- Store all inventory data in refuge land Geographic Information System (RLGIS).
- Repeat inventories at a minimum of 10-year intervals.
- Apply early detection, rapid response strategies to attack new infestations before they become large and costly to treat.
- Use the GIS to predict areas at greatest risk of new infestations.
- Conduct a surveillance program for new infestations of invasive plants every 2 years.
- Every 5 years, complete surveys for invasive plants using a GPS map locations. Create a baseline map and collaborate with partners to map records for neighboring lands.
- Monitor change over time by collecting RLGIS cover-type data for all invasive plant species.
- Map and store in the RLGIS anecdotal observations of infestations made by Service staffs while conducting other work activities.
- Map sites of invasive plant treatment each year in the RLGIS.
- Monitor infestation rates and effectiveness of control efforts.
- Share GIS layers of invasive plant infestations with partners.
- Attain help with invasive plants (applications and monitoring) by pursuing additional money through partnerships, grants, and invasive plant programs.
- Communicate with local, State, and Federal agencies and the public about invasive plant issues. In

a timely manner, make known information about new infestations, effective or ineffective treatment methods, and new treatment options.

- Coordinate invasive plant control by meeting at least once per year with county weed boards, representatives from weed management areas, and other partners to share information and discuss control strategies.
- Respond promptly to all landowner or other public complaints and address public complaints about invasive plants on Service-owned lands, while using integrated pest management strategies.
- Ensure all seed used to restore habitat is certified weed-free. Avoid purchasing seed from sources known to have violated the weed-free seed regulation.
- Begin habitat management treatments to develop habitat that will be more resilient to invasive plants.

Objectives for Invasive Species, Alternative C

Invasive Species C1. Same as Invasive Species A1, B1, and D1.

Invasive Species C2–C9. Same as Invasive Species B2–B9 and D2–D9.

Rationale for Invasive Species C1–C9 (Same as B and D)

Strategies for Invasive Species C1–C9

Same as B, plus:

- Increase law enforcement of weed-free hay regulations.

Objectives for Invasive Species, Alternative D

Invasive Species D1. Same as Invasive Species A1, B1, and C1.

Invasive Species D2–D9. Same as Invasive Species B2–B9 and C2–C9.

Rationale for Invasive Species D1–D9 (Same as B and C)

Strategies for Invasive Species D1–D9 (Same as B)

HABITAT–CLIMATE CHANGE

Over the past century, human activities have led to increases in “greenhouse” gases in the atmosphere. These gases are primarily carbon dioxide and methane, nitrous oxide, and halocarbon emissions. Places where atmospheric carbon may be sequestered are the ocean and in plants. About half the carbon emitted during the last 50 years is now stored in these places. The rest has remained in the air. Sources and sinks of carbon will likely change as climate continues to warm. The following information summarizes information from a comprehensive report produced by the U.S. Global Change Research Program (Karl et al. 2009) and influenced the climate change objectives.

Global Climate Change

Global average temperature and sea level have increased, and precipitation patterns have changed. Global temperatures are expected to rise at least 1 °F over the life of the CCP. Current climate change studies indicate that a further 2 °F increase will lead to severe, widespread, and irreversible impacts. Global temperatures are expected to continue rising and precipitation patterns will change (dry areas will be drier and wet areas will be wetter). Sea levels will continue to rise. Currently rare extreme weather events will become more common and abrupt changes are possible due to ice level collapse, thawing of frozen soil, and change in ocean current circulation.

National Climate Change

The average U.S. temperature has risen more than 2 °F over the past 50 years and is expected to rise more in the future. Projections of future precipitation indicate that northern areas will be wetter and southern areas, particularly in the west, will be drier. Extreme weather events such as heavy downpours of rain, heat waves, regional drought, and hurricanes have increased in the past 50 years and likely will increase further in the future. Sea levels have risen along the United States’ coasts and will continue to rise. Cold-season storm tracks are shifting northward and the strongest storms are likely to become stronger and more frequent. Arctic sea ice is declining rapidly and this is very likely to continue.

Climate Change Influence in the Great Plains

The refuge is located in the northwestern Great Plains. As in much of the rest of the Nation, the Great Plains is projected to experience increases in temperature, evaporation, and drought frequency. The average temperature is expected to increase 2–4 °F by the year 2020 in the plains. The final CCP will be in place in 2020.

Agriculture and ranching will be stressed by an increasingly limited water supply. Drought and grazing-adapted weeds will increasingly compete with native vegetation on rangelands. Wetland and riparian areas will decrease in size or be lost. Preservation of native vegetation, wetlands, and riparian areas will require increased vigilance, adaptation, and mitigation as the climate changes.

Objectives for Climate Change, Alternative A

Climate Change A1. Over 15 years, implement the Service’s climate change initiatives as they apply to the refuge:

- Biological planning and conservation design at broad landscape scales.
- Landscape conservation that supports climate change adaptations by fish, wildlife, and plant populations of ecological and societal significance.

- Monitoring and research partnerships.
- Achieving carbon neutrality by 2020.
- Building capacity to understand, apply, and share terrestrial carbon sequestration science, and work with partners to sequester atmospheric green house gases while conserving fish and wildlife habitat at landscape scales.
- Providing educational and training opportunities for Service employees regarding the implications and urgent nature of climate change as it relates to the Service mission and will engage them in seeking solutions.
- Public education.
- Partnerships—locally, nationally, internationally. (Same as Climate Change B1, C1, and D1.)

Rationale for Climate Change A1. The Service would implement climate change objectives within the existing habitat management practices.

Strategies for Climate Change A1

- Continue maintaining a wind turbine, recycling effort, increasing energy efficiency and adopting other ways to reduce the refuge's carbon footprint
- Consider what conditions precipitated by climate change that the refuge may deal with like increased drought, longer fire seasons, hotter fires, loss of plant and wildlife species, increase of other plant and wildlife species, change in migration patterns, and relocations of species.

Objectives for Climate Change, Alternative B

Climate Change B1. Same as Climate Change A1, C1, and D1.

Climate Change B2. By year 3, develop a climate change research project with other partners that can be implemented across the Great Plains that identifies fire, sentinel plant, pollinators, and sentinel animal changes in behavior or use due to climate change.

(Same as Climate Change C2 and D2.)

Rationale for Climate Change B1–B2. Ecological systems store large amounts of carbon in plants and soils; they regulate water flow and quality; and they stabilize local climates. These functions are not accounted for financially, but society depends on them. Ecosystem processes are the underpinning of these services: photosynthesis, the plant and soil processes that recycle nutrients from decomposing material and maintain soil fertility, herbivory, predation, natural fire, and flooding, and the processes by which plants draw water from the soil and return water to the atmosphere. These ecosystem processes are affected by climate and the concentration of carbon in the atmosphere.

Biological diversity in ecological systems is itself an important resource that maintains the ability of

these systems to provide the services on which society depends. Many factors affect biodiversity including the following: climate conditions, the influences of competitors, herbivores, predators, parasites and diseases; and disturbances such as herbivory, and fire. Human-induced climate change, in conjunction with nonclimate stresses, is exerting major influences on natural environments and biodiversity, and these influences are expected to grow with increased warming.

The following information is from the publication *Global Climate Change Impacts in the United States* (Karl et al. 2009). Large-scale shifts have occurred in the ranges of species and the timing of seasons and animal migration; these factors are very likely to continue. The range and timing of each species shift will be in response to its sensitivity to climate change, its mobility, its lifespan, and the availability of the resources it needs (such as soil, moisture, food, and shelter). The speed with which species can shift their ranges is influenced by factors including their size, lifespan, and seed dispersal techniques in plants. Some migration pathways will be blocked by development and habitat fragmentation. All of these variations result in the breakup of existing ecosystems and the formation of new ones, with unknown consequences. Interactions among effects of climate change and other stressors will greatly increase the risk of species extinctions. At the same time, insect pests, disease pathogens, and invasive weeds have increased, and these trends are likely to continue.

A first step to mitigate climate change is to advance the management of ecological processes on the site to reduce nonclimate stressors (Hansen et al. 2003). In many places habitat fragmentation, over use, invasive species, and herbivory, are nonclimate stressors having a greater affect on species viability than climate change, at this time. Reduction of nonclimate stressors will promote ecological resilience and insulate species from subtle (not substantial) changes in climate.

To reduce the effects of these stressors and the future affects of climate change the refuge would develop heterogeneity of species and structure, protect grassland types across environmental gradients, promote connectivity and corridors to facilitate migration, restore natural fire regimes, and promote sustainable herbivory.

The refuge staff is currently working with multiple partners to restore historical ecological processes, promote heterogeneity, and build habitat linkages and ecological resilience within the Missouri River Breaks and the northern Great Plains. Habitat linkages and corridors would be developed through partnerships with the landscape conservation cooperative sphere of influence (refer to strategic habitat conservation in chapter 1).

The refuge would continue to take reactive and anticipatory approaches to managing landscapes for carbon sequestration and climatic resilience—heterogeneity of species, structure, and succession. Fire-herbivory interactions are keys to resilience in this region. The focus would be on research, monitoring, and management of carbon sinks and sources, black carbon, climate sentinel plants and dependent animals and ecological process sentinel plants and the food web that uses them, beginning with pollinators.

The refuge would evaluate the response of ecosystems to fire, herbivory, and other ecological processes using sentinel plant species. These diagnostic plant species warn of impending ecosystem-wide changes to plant and animal populations and can guide adaptive management actions. They are the first to vanish. They serve primarily not as management goals themselves but as diagnostic lookouts for fully functional ecological processes. The sentinel approach to ecological systems management uses first to decline species as diagnostic and direct indicators of ecosystem well being and management direction.

The refuge would assess and reduce carbon footprints associated with using adaptive management to achieve resilience to climate change including the role of wildland fire.

Since fire happens in the region as both unplanned wildfire or as prescribed fire, the refuge would focus much of the research on pyrogenic carbon sequestered in the soil from fire. Fire is also important for the climatic resilience associated with diversity of species and succession (DeLuca and Aplet 2008).

The refuge would serve as a model for other land management agencies and landowners to manage for wildlife first with best management practices for climate resilience and carbon sequestration. The components of this program would include a focus carbon sequestration, monitoring, and management on climate sentinels, ecological process sentinels, and resilience adaptation.

Strategies for Climate Change B1–B2

- Assist in implementation of Service’s Climate Change Plan (refer to Chapter 1–Introduction).
- Monitor the effects of climate change on the spread of West Nile virus and the decline of buffaloberry.
- In cooperation with universities and other partner scientists and statisticians, develop methods to identify, inventory, and monitor climate sentinel plant species and those determined potentially affected wildlife species.
- Evaluate success with climate sentinel plant species population viability analysis at permanently established trend sites.
- Continue to monitor wildlife populations that have been determined as “first to decline” for popula-

tion trends within each species’ already established habitat zones.

- In cooperation with partners, reestablish climate sentinel plant species populations on sites where they have been extirpated.
- Reduce carbon footprint of refuge operations and continue “greening” efforts to meet climate change initiatives (for example, upgrade offices to “green standards”—encourage teleconferencing, turning off lights, recycling, turning down heat, and installing solar panels or a small individual wind turbine for new facilities at the Sand Creek Field Station).
- Study carbon sequestration benefits of the refuge.
- Incorporate Service’s climate change messages in the refuge’s public use programs.

Objectives for Climate Change, Alternative C

Climate Change C1. Same as Climate Change A1, B1, and D1.

Climate Change C2. Same as Climate Change B2 and D2.

Rationale and Strategies for Climate Change C1–C2
(Same as B)

Objectives for Climate Change, Alternative D

Climate Change D1. Same as Climate Change A1, B1, and C1.

Climate Change D2. Same as Climate Change B2 and C2.

Rationale and Strategies for Climate Change D1–D2
(Same as B)

WILDLIFE–BIG GAME

There are six big game species of primary importance that are found on the refuge: Rocky Mountain elk, mule deer, white-tailed deer, pronghorn, Rocky Mountain bighorn sheep, and mountain lion.

Objectives for Big Game, Alternative A

The wildlife objectives and strategies listed for alternative A are the actions selected in the record of decision from the 1986 EIS. Alternative A would continue managing wildlife according to these actions; many have already been implemented. The 1986 EIS blended objectives and strategies, and these were separated to the extent possible to more closely follow the format used in current CCP documents.

Big Game A1 (elk). Over 15 years, maintain elk habitat in good to excellent condition and improve security cover to a level capable of maintaining a population of 2.5 over-wintering elk per square miles in the coniferous and closely associated grassland communities.

Big Game A2 (mule deer). Over 15 years, improve and maintain mule deer habitat on the refuge in sage-grassland, ponderosa pine-juniper, and grassland-



Mule deer populations on the refuge fluctuate, and the Service has several units with more restrictive hunting regulations.

deciduous shrub vegetative types in good to excellent condition to support overwintering populations of 10 deer per square mile, in a manner that will also benefit sharp-tailed grouse. (Note: 10 deer per square mile refers to the total estimated population, not the density of deer observed during aerial surveys as not all deer are detected). Continue harvest management efforts that strive to achieve a posthunting season mature buck to doe ratio of at least 20:100 (mature is defined as bucks having four or more points on at least one antler).

Big Game A3 (pronghorn). Over 15 years, improve and maintain pronghorn winter habitat in good to excellent condition on suitable juniper and sage-grassland sites to support 1,500 wintering animals.

Big Game A4 (bighorn sheep). Over 15 years, continue to manage bighorn sheep populations and habitat to support a minimum of 160 observed animals and for an average age of 7.5 years old for harvested rams.

Big Game A5 (bighorn sheep). Over 15 years, expand Rocky Mountain bighorn sheep into suitable habitat.

Rationale for Big Game A1–A6. The focal issue addressed in the 1986 EIS was livestock grazing and its effects

on wildlife habitat (refer to Chapter 2—Refuge History and Vision). Although some of the objectives from the 1986 EIS were accomplished and other objectives evolved after the EIS, the management emphasis on big game would continue (refer to Chapter 4—Affected Environment, Big Game, for a discussion of current conditions). At the time of the 1986 EIS, many of the species specifically addressed were listed under the Endangered Species Act, but the Service felt it was important to focus on some of the other ungulate species for maintaining balanced wildlife populations, supporting recreation, and contributing to the overall mission of the Refuge System.

Strategies for Big Game A1–A3.

- Continue to respond to inquiries and provide information about refuge hunting opportunities. (Same as B, C, and D.)
- Continue listening to refuge users throughout the year and annually review refuge hunting regulations to ensure clarity, address any emerging issues or concerns and adjust as necessary to achieve refuge objectives. (Same as B, C, and D.)
- Continue to publish the refuge hunting regulations brochure to inform the public of hunting opportunities (including accessible opportunities) and refuge-specific regulations. (Same as B, C, and D.)
- Distribute the refuge's brochure more widely. (Same as B, C, and D.) Continue to prohibit mountain lion and predator hunting.
- Permit limited coyote hunting (mid-October through March 1).
- Continue to prohibit trapping.
- Require nontoxic shot for waterfowl hunting to reduce the incidental poisoning of nontarget wildlife. Continue to allow nontoxic or lead shot for upland game bird and mourning dove hunting. (Same as C.)
- Continue to monitor boat use for accessing hunting areas along the river to ensure that wildlife species utilizing the habitat along the river are not negatively affected over the long term. (Same as B, C, and D.)

Objectives for Big Game, Alternative B

Big Game B1. Within 5 years, in cooperation with MFWP develop and coordinate big game aerial surveys and research projects concerning basic ecology of all big game across the landscape surrounding the refuge.

Big Game B2 (elk and mule deer). Within 5 years of the plan's approval, work with MFWP to manage elk and mule deer populations at the highest levels possible without negatively affecting habitat or other wildlife species (refer to Upland Strategies for Objectives B1–B8 if monitoring indicates habitat conditions are declining).

Big Game B3 (elk and mule deer). Over 15 years, manage harvest levels to result in herd sex and age ratios similar to a lightly harvested population. Manage elk harvest levels to achieve a ratio of 35–40 brow-tined bulls per 100 cows posthunting season. Manage mule deer harvest levels to achieve 35–40 adult bucks per 100 does posthunting season (all bucks older than 1.5 years old).

Big Game B4 (pronghorn). By 2015, develop winter and summer survey techniques to monitor pronghorn abundance and distribution with the aim of documenting use on the refuge by 1,500 pronghorn as called for in Executive Order 7509.

(Same as Big Game C2.)

Big Game B5 (pronghorn). By 2015, collaborate with partners to initiate a pronghorn ecology research study with a focus of documenting movements, habitat use, and what role refuge lands play in pronghorn ecology in a landscape context.

(Same as Big Game C3.)

Big Game B6 (bighorn sheep). Over 15 years, work with the MFWP, landowners and cooperators to expand the huntable (at least 45 rams per 100 ewes with at least 30 percent of rams having a $\frac{3}{4}$ curl and an average age of at least 6.5 years) bighorn sheep populations in suitable and unoccupied habitat.

(Same as Big Game C4.)

Big Game B7 (bighorn sheep). Over 15 years, manage harvest levels to result in herd sex and age ratios similar to a lightly harvested population, and at the highest densities possible that do not negatively affect habitat or result in elevated risks to disease outbreaks.

(Same as Big Game C5.)

Big Game B8 (bighorn sheep). Within 5–7 years establish a huntable bighorn sheep population east of Timber Creek out onto Harpers Ridge.

(Same as Big Game C6.)

Big Game B9 (bighorn sheep). Within 7–15 years work with MFWP, cooperators and private landowners to establish a huntable bighorn sheep population south of Missouri River where there is about 200 square miles of suitable habitat, of which 90 percent is in public ownership (65 percent is on the refuge).

(Same as Big Game C7.)

Big Game B10 (mountain lion). By 2015, with support from MFWP and other cooperators, develop and implement methodology for mountain lion monitoring to determine population levels, abundance, distribution and population trends.

Rationale for Big Game B1–B10. In 1935 Olaus Murie surveyed the Missouri River Breaks area to determine the potential for creating a refuge (refer to

Uplands in chapters 3 and 4). Amid his many observations, Murie believed the west end of the refuge could support 2,000–2,500 elk, and he predicted that mule deer would continue to flourish in the pine uplands. He also believed that the 22,000-acre area on the south side of the refuge could support 400–500 bighorn sheep (Murie 1935). With this alternative focused on maintaining abundant wildlife populations, management would focus on producing relatively large populations of big game relative to surrounding areas and expanding distribution where possible. The allowable abundance of big game animals would be determined by habitat monitoring that demonstrates any negative effects of big game on other species or their habitats.

Big game populations are highly dynamic and cover large areas in their daily and seasonal movements. Cooperation with landowners and wildlife managers is necessary to ensure that big game populations are healthy to support wildlife-dependent recreational activities. Coordination of surveys and research will ensure these populations will continue to be robust and provide the opportunity for sustained harvest. Research studies would focus on movement of animals, interaction with other ungulates, response to patch burns, browse availability, and use the data to build habitat suitability models.

Strategies for Big Game B2–B3 (elk and deer)

- Using previous survey data, habitat modeling and in collaboration with partners, tailor big game density objectives to specific ecological regions of the refuge based on the ability of different areas to support big game. Regulate and monitor harvest levels. (Same as D.)
- Develop habitat monitoring programs to detect when, where and which ungulate populations negatively affect habitats.
- Continue or enhance current ungulate population monitoring surveys to document cervid abundance, distribution and herd composition.
- Continue to meet with MFWP and other cooperators to implement habitat and population monitoring procedures to make adjustments in management based on monitoring data.
- Continue throughout the life of the CCP with chronic wasting disease monitoring in cervids and respond as needed to detection of chronic wasting disease as already specified in the refuge's chronic wasting disease management plan (FWS 2007b). (Same as C and D.)

Strategies for Big Game B4–B5 (pronghorn)

- Establish pronghorn survey areas based on habitat potential modeling using GIS.
- Conduct aerial surveys and adjust as needed with information resulting from research studies.

- Based on pronghorn research results and habitat monitoring specific to pronghorn, manage live-stock grazing and fire to maintain or enhance pronghorn habitat.

Strategies for Big Game B6–B9 (bighorn sheep)

- Develop habitat potential maps using GIS, published literature and field surveys to delineate what is thought to be bighorn sheep habitat.
- Develop and carry out reintroduction plans in conjunction with MFWP to stock areas with bighorn sheep.
- Use GPS collars on current residents in established areas, and newly translocated individuals into new areas, to monitor survival, sightability, habitat use and movements.
- Continue monitoring bighorn sheep populations with aerial winter and summer counts and ground-based surveys.
- Establish habitat and disease risk monitoring programs to evaluate habitat and herd health conditions.
- Continue to restrict ewe permits east of Timber Creek until all available habitat is occupied and population levels suggest a need for reduction.
- Harvest ewes (in any area) when there is a demonstrated need to reduce sheep density for herd health (disease potential), or because of habitat degradation.

Strategies for Big Game B10 (mountain lion)

- Maintain and monitor GPS and VHF (very high frequency) collars on 5–10 percent of the estimated lion population on the refuge.

Objectives for Big Game, Alternative C

Big Game C1 (elk and mule deer). Over 15 years, manage elk and deer populations at levels consistent with MFWP objectives, the capacity of adjacent private lands, and the tolerance of adjacent private landowners.

Big Game C2–C3 (pronghorn). Same as Big Game B4–B5.

Big Game C4–C7 (bighorn sheep). Same as Big Game B6–B9.

Big Game C8 (bighorn sheep). Over 15 years, manage population levels for rams and ewes as outlined in MFWP's conservation strategy for bighorn sheep.

Big Game C9 (mountain lion). Within 10 years, use population monitoring data to evaluate, and implement if warranted, a mountain lion hunt program.

Rationale for Big Game C1–C9. With the focus on recreation and public uses, management of big game resources is geared toward maximizing harvest and recreation opportunities while still maintaining a

balance with other needs and requirements. MFWP management is geared toward achieving this objective (MFWP 2008).

Strategy for Big Game C1–C9

- Adopt MFWP population objectives and hunting seasons and regulations for those species for which harvest is currently allowed on the refuge. Adjust harvest levels in response to habitat conditions, sportsmen desires, and social tolerance of adjacent landowners.

Strategies for Big Game C1 (elk and deer)

- Adopt MFWP adaptive mule deer harvest approach, basing conservative, standard or liberal harvest regulations on long-term average densities and fawn recruitment trends.
- Continue with chronic wasting disease monitoring. (Same as B and D.)

Objectives for Big Game, Alternative D

Big Game D1. Develop cooperative big game population and habitat monitoring programs with MFWP by 2015. Establish population levels, sex and age composition targets, and harvest strategies that are jointly agreed to and tailored to the varied habitat potential on the refuge during the development of the HMPs. Design hunting regulations to provide a variety of quality recreational opportunities, including population objectives with diverse male age structures not generally managed for on other public lands.

Big Game D2 (elk and mule deer). Manage elk harvest levels to result in a ratio of 20–30 bulls to 100 cows posthunting season. Manage mule deer harvest levels to achieve about 25 total bucks per 100 does posthunting season.

Big Game D3 (elk and deer). Within 5 years, work with all partners to initiate ecological studies of elk and mule deer habitat selection and response to management actions (for example, prescribed fire) and natural disturbances.

Big Game D4 (bighorn sheep). Manage bighorn sheep ram harvest levels to result in an average age of 6.5 years old for harvested rams (the MFWP objective is at least 6.5 years old). Manage ewe harvest in the Mickey/Brandon Buttes area to maintain a population of 25–30 ewes (same as MFWP objective). Collectively manage ewe harvest in all areas to maintain a total population of 225, +/-10 percent, observed during aerial surveys; average density would range from 1.8 to 2.2 bighorn sheep/square mile (the MFWP objective is 175–200 sheep, but does not include now-occupied habitat east of Timber Creek of about 20 square miles).

Big Game D5 (mountain lion). Same as Big Game B10, except consider harvest if monitoring shows a lim-

ited harvest could be sustained (refer to objectives and rationale under Public Use–Hunting).

Rationale for Big Game D1–D4. Early explorers left vivid accounts of the abundant big game populations that inhabited the region (Moulton 2002). With restoration of natural ecological processes the focus of this alternative, the aim is to restore such game abundance and diversity within the current limits of habitat capability. Prior to those visits of early explorers, the intensity of human harvest of big game was different than today, as likely there was not the active selection for killing the largest antlered males possible that is the norm of some hunting programs today.

National wildlife refuges are the only Federal lands managed specifically for wildlife conservation, and the objectives reflect an emphasis on sustaining abundant and healthy wildlife populations. Such wildlife-priority management is not generally possible elsewhere because of multiple use mandates on other Federal lands and conflicting priorities on State and private lands. The big game objectives reflect the wildlife-priority emphasis and for providing high-quality opportunities for wildlife-dependent recreation, which are described in the Improvement Act and the Service’s hunting policy (FWS 2006f).

Big game hunting is the dominant public use activity on the refuge and surrounding lands, accounting for nearly 90,000 hunter visits (refer to Chapter 4–Affected Environment, 4.5 Visitor Services). Between Service-owned lands, BLM lands, and MFWP block management areas, there are huge areas open to public hunting. Such free and open access to such large blocks of land is becoming increasingly valued by the hunting public as access to some private lands becomes more restrictive. The Service, together with its partners, would work to provide access and quality recreational experiences for hunting big game populations throughout the refuge. However, some limitations may need to be imposed, but the Service believes there would be public support for this approach.

The Missouri River Breaks region, including the refuge is recognized throughout Montana as a highly valued wildlife recreation sites anywhere in Montana (Dickson 2008) (for more information, refer to figure 36 in Chapter 4–Affected Environment).

Comparatively conservative harvest levels for bull elk by MFWP in the Missouri River Breaks has likely contributed to the popularity (statewide and nationally) of the big game resources in this area. The long-term average adult bull-to-cow ratio in hunting district 410 is 32:100 (Tom Stivers, personal communication, June 2010). The objective in the MFWP elk management plan for the Missouri Breaks area calls

for a minimum of 30:100, or three times the objective of a minimum of 10:100 found in many western Montana areas. In many years the actual bull-to-cow ratio in the Missouri Breaks is substantially higher, averaging around 45:100 in Phillips County (Mark Sullivan, personal communication, June 2010). Such management for quality elk herds and recreational opportunities is one reason why the Missouri Breaks are valued by the public.

Bighorn sheep are a highly valued big game animal, and ram harvest levels across Montana are managed conservatively with an emphasis on having opportunities to harvest older rams. As stated in the MFWP Bighorn Sheep Conservation Strategy, the goal for Missouri River Breaks bighorn sheep is to manage for healthy and productive populations with a diverse age structure of rams.

Alternatively, harvest guidance from the MFWP Bighorn Sheep Conservation Strategy could be followed that is based on population size, ram:ewe ratio and number of $\frac{3}{4}$ + curl rams observed.

The refuge views sex and age structure of big game populations as important considerations in managing human harvest of native ungulates to achieving ecological resilience and biological integrity (FWS 2001). Ungulate population management considers densities, social structures, and population dynamics. The aim is to strike the right balance between managing for natural wildlife populations (as called for in the executive orders that established Game Ranges back in the 1930s), wildlife-dependent public uses, and other needs and responsibilities. The Service believes the big game objectives outlined under alternative D strike that right balance.

Strategies for Big Game D1–D5. Similar to B, except:

- Using previous survey data, habitat modeling, and collaboration with partners, tailor big game density objectives to be reflective of varied habitat capabilities.
- Regulate harvest to maintain big game populations at levels that promote healthy sentinel plant populations and other species. Consider effects on adjoining landowners.
- Identify and protect critical wintering habitat for pronghorn by reducing hazardous fuel in these areas using prescribed fire.

WILDLIFE–FURBEARERS and SMALL PREDATORS

Furbearers include beaver, muskrat, river otter and mink, raccoons, badgers, and other small mammals. Small predators include coyotes, swift fox, weasel, and civet cat (spotted skunk).

Objectives for Furbearers and Small Predators, Alternative A

No objectives currently exist for managing furbearers. Under alternative A, there would be no objectives and strategies established for managing any of these species.

Objectives for Furbearers and Small Predators, Alternative B

Furbearers and Small Predators B1. By 2016, work with partners to determine population levels and distribution of furbearers and small predators that currently occur on the refuge.

Furbearers and Small Predators B2. By 2017, evaluate habitat and determine the habitat suitability of reintroducing populations of swift fox to the refuge and, if so, the number of breeding population pairs that could be reintroduced into suitable habitat. If reestablishment does not occur by 2020, more active management would be necessary to establish a viable population on the refuge.

(Same as Furbearers and Small Predators D3.)

Furbearers and Small Predators B3. As part of the Service's Strategic Habitat Conservation and Landscape Conservation Cooperatives (refer to Chapter 1—Introduction) evaluate the potential for natural colonization of extirpated species into suitable habitats by evaluating current corridors. If extirpated species naturally colonize the refuge then work with State and others to ensure refuge management is compatible with State and Federal management plans. (Same as D).

Rationale for Furbearers and Small Predators B1–B3. Protection from harvest should result in maximum abundance, consistent with the focus of this alternative. Little is known about limiting factors for these species on the refuge, but habitat management for diversity and health should benefit them. Expanding suitable riparian habitats would provide the basis for increased populations of muskrat, beaver, river otter and mink.

A few swift fox sightings have been reported on/near the refuge and reintroduction into suitable habitat would help speed population establishment.

A research project on bobcats conducted in 1979 to mid-1980 indicated illegal hunting to be the largest mortality factor among radio-collared bobcats on the refuge (Knowles 1981). Current population numbers on the refuge remain relatively unknown; however, continued restrictions would be beneficial to maintaining a viable bobcat population in the Missouri River Breaks as areas around the refuge continue to be hunted.

Strategies for Furbearers and Small Predators B1–B3

- Maintain current protection and do not permit any harvest. Reintroduce swift fox. Restore riparian communities in Missouri River tributaries to promote beaver, muskrat, river otter, and mink expansion. Increase law enforcement to reduce potential illegal bobcat take. (Same as D.)
- Fencing areas to provide for protection during the reestablishment period of reintroduced swift fox.

Objectives for Furbearers and Small Predators, Alternative C

Furbearers and Small Predators C1. By 2014, prior to initiating harvest opportunities for furbearer species, develop and implement monitoring program to determine relative densities of regulated and unregulated furbearing species.

Furbearers and Small Predators C2. By 2016, determine minimum population levels to support sustainable harvest opportunities for furbearing species regulated by MFWP (muskrat, mink, bobcat, and beaver) consistent with providing a moderate to excellent opportunity for public viewing of these furbearer species.

Furbearers and Small Predators C3. Maximize sustainable harvest opportunities for furbearing species not regulated by MFWP (red fox, coyote, raccoon and badger, but exclude least weasel, long-tailed weasel and striped skunk) consistent with providing reasonable public opportunities for viewing of these furbearer species.

Rationale for Furbearers and Small Predators C1–C3.

Currently, take of State-regulated furbearing species is not permitted on the refuge. Creating opportunity for sustainable use of these wildlife species would increase public use and economic use emphasis.

Currently, for unregulated furbearing or small predator species, take of these (with the exception of coyotes) is not permitted on the refuge. Creating opportunity for hunting and trapping of these wildlife species would increase public use and economic use emphasis.

Strategies for Furbearers and Small Predators C1–C3

- Initiate studies and monitoring program to determine populations (indices of abundance) levels before initiating any action on opening any additional furbearer species for harvest.
- Determine if trapping is appropriate and compatible with refuge purposes. If so then complete trapping packages to allow trapping of furbearers on the refuge that are regulated by MFWP.
- Develop trapping packages to allow trapping of red fox, coyotes, raccoon, and badgers on the ref-

uge. Develop hunting packages for badger, raccoon, and red fox to allow shooting these species on the refuge.

Objectives for Furbearers and Small Predators, Alternative D

Furbearers and Small Predators D1. Within 5 years, initiate comprehensive monitoring program to determine density levels and distributions if considering opening furbearer species for harvesting (either hunting or trapping).

Furbearers and Small Predators D2. Over 15 years, maintain self-sustaining populations (able to maintain its relative abundance at time of initiating harvest) of furbearing species that are regulated by MFWP (muskrat, beaver, mink, swift fox, bobcat) and unregulated by MFWP (least weasel, long-tailed weasel, striped skunk, badger, raccoon, red fox, coyote) by restricting and/or regulating harvesting opportunities on the refuge.

Furbearers and Small Predators D3. Same as Furbearers and Small Predators B2.

Furbearers and Small Predators D4. Within 10 years, have viable beaver populations in a minimum of two tributaries of the Missouri river on the refuge.

Furbearers and Small Predators D5. Over 15 years, encourage research on priority furbearer species on the refuge to determine its ecological relevance to conservation. Universities or other organizations will conduct research with assistance from the refuge in the form of funding, supplies, volunteers, or technical assistance.

Furbearers and Small Predators D6. Within 1 year, eliminate the taking of coyotes by U.S. Department of Agriculture (Wildlife Services) on the refuge.

Furbearers and Small Predators D7. Same as Furbearers and Small Predators B3.

Rationale for Furbearers and Small Predators D1–D7. Same as B, except the Service would evaluate the harvest potential for furbearers and small predators to provide a wildlife-dependent recreational opportunity (refer to objectives under Public Use–Hunting below). A stable or growing population of furbearers and small predators would be maintained for its contribution to the overall biological diversity, biological integrity, and environmental health of the refuge.

Strategies for Furbearers and Small Predators D1–D7

- Maintain current protection and do not permit any harvest until population surveys are completed, and it has been determined that a harvest strategy could be implemented without affecting the naturally occurring population dynamics. Reintroduce swift fox. Restore riparian communities in Missouri River tributaries to promote beaver, muskrat, river otter, and mink expansion. Increase law enforcement to reduce potential illegal bobcat take. (Same as B.)
- Maintain current protection for those species already protected on the refuge. Allow hunting of red fox and coyotes.
- With stable population levels, the Service will allow furbearers and small predators (coyote, long tailed and least weasel, swift fox, skunk, beaver [keystone species], muskrat, mink, river otter, bobcat, badger, raccoon, and red fox) as defined by MFWP to be managed for naturally occurring population dynamics.
- Develop a standardized data sheet to collect information in regards to furbearing animals that will be input into a new designed database to establish a GIS layer for mapping their locations).

WILDLIFE–AMERICAN BISON RESTORATION

The American bison historically ranged throughout the Great Plains and the last bison was extirpated from this area in the late 1800s. Bison played a significant ecological role with fire to shape the landscape. Restoring historical fire-return intervals and bison would be a major step in restoring the biological integrity and natural ecosystem functions on the refuge and surrounding areas.

The momentum and interest in bison restoration in North America has increased substantially in recent years. The International Union for Conservation of Nature established the Bison Specialist Group that was charged in 2005 with developing a “North American Strategy for Bison Conservation”. That comprehensive plan is expected to be released



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American Badger

in the near future and will provide scientifically based guidelines for proponents interested in restoring bison at an ecologically functional scale.

The Wildlife Conservation Society has recently reestablished the American Bison Society to promote bison conservation. The society, originally active from 1905 to 1935, was largely responsible for keeping bison from extinction then, and establishing the conservation herds that are managed today by the Service and National Park Service for the American public.

MFWP's Comprehensive Fish and Wildlife Conservation Strategy lists the American bison as a priority, tier 1 species for conservation. MFWP and others have invested time and effort trying to produce brucellosis-free bison from the genetically valuable Yellowstone herd as stock to establish herds managed for conservation and ecological purposes elsewhere.

There would be multiple agencies, partners, and cooperators in any proposed bison restoration effort. The Service has taken the position that it will not consider reintroducing bison on the refuge unless MFWP initiates an effort to restore bison, as a wildlife species on a large landscape. The Service recognizes the State's role in managing native wildlife and would work cooperatively with MFWP in the development of a bison restoration plan. MFWP does not have any plans at this time to consider reintroducing a free-ranging herd of bison in the area. The Service has no desire to manage another high fence captive bison herd on Service lands.

Objectives for American Bison Restoration, Alternative A

There are no objectives under alternative A.

Objectives for American Bison Restoration, Alternative B

Bison B1. Over 15 years, continue to work with MFWP, conservation organizations and neighbors to evaluate the economic, social and biological feasibility of restoring bison as a natural component on the surrounding landscape.

Bison B2. On advancement of a MFWP proposal that includes the refuge lands in a bison restoration effort, develop a step-down framework defining under what conditions the refuge would participate.

Bison B3. Within 1 year of that framework development (Bison B2), and in cooperation with MFWP and other partners, develop a bison management plan that specifies and ranks areas of suitable habitat, establishes appropriate abundance, composition and distribution targets based on habitat conditions and appropriate for management of wildlife and recreation on a national wildlife refuge and details

cooperative management responses to be applied to anticipated conflict situations.

Bison B4. Over 15 years, continue to develop and carry out research proposals to better understand the interaction of bison, livestock, wild ungulates and other wildlife and vegetation in relation to fire and other abiotic influences.

Rationale for American Bison Restoration B1–B4. Any reintroduction of bison would need to be a cooperative venture with MFWP. At this time, the State does not have an ongoing plan to reintroduce bison in the Missouri River Breaks.

The Service would cooperate with MFWP, BLM, DNRC, conservation organizations, and others to conduct the necessary biological, social and economic research to determine the feasibility of such a proposal.

The Service recognizes the ecological importance of such an effort, but also recognizes the complexity and controversy that would be associated with any such effort. Hence, the approach under this alternative is to work cooperatively and collaboratively with others as a full partner in any proposal with full engagement of the public.

The following strategies would be implemented concurrently with any proposal by MFWP for bison restoration in areas around the refuge.

Strategies for American Bison Restoration B1–B4 (Same as D)

- Work with MFWP, major universities, World Wildlife Fund, The Nature Conservancy, American Prairie Foundation, and others to develop and carry out research proposals to evaluate the biological, social, and economic feasibility of restoring free-ranging bison in and around the refuge.
- Work with a variety of economists to determine the potential economic effects/impacts of a free-ranging bison herd in the area.
- Prior to any bison reintroduction, finalize a cooperative bison management plan, developed and agreed to by all involved management parties, that addresses population objectives and management, movement of animals outside restoration areas, genetic conservation and management, disease management and conflict resolution procedures.

Objectives for American Bison Restoration, Alternative C

Bison C1. Over 15 years, if bison are restored to areas outside the refuge, and animals migrate into the refuge as State-managed wildlife species, the refuge would adopt the MFWP management plan.

Rationale for American Bison Restoration C1. Under this alternative, the Service would not participate in an active restoration proposal for the refuge. This

objective attempts to balance economic uses, such as livestock grazing, with bison restoration by not intending to actively restore bison on the refuge land, but passively accepting bison as wildlife to be managed in accordance with MFWP management guidelines.

Strategy for American Bison Restoration C1

- Work with MFWP to manage habitat and bison population for any bison that migrate onto the refuge.

Objectives for American Bison Restoration, Alternative D

Bison D1–D4. Same as Bison B1–B4.

Rationale and Strategies for American Bison Restoration D1–D4 (Same as B)

WILDLIFE—BIRDS

The refuge has been designated an Important Bird Area by the National Audubon Society because “The site regularly holds significant numbers of a globally threatened species, or other species of global conservation concern (National Audubon Society 2009). More than 250 species of birds have been documented on the refuge including both migratory birds and residents.

Objectives for Birds, Alternative A

These objectives were identified in the 1986 EIS.

Birds A1. Maintain existing migration habitat for bald eagles and determine feasibility of establishing a breeding population.

Birds A2. Improve and maintain habitat for sharp-tailed grouse and associated species in good to excellent condition in the ponderosa pine-juniper, juniper, and grass-deciduous shrub types to support (on suitable areas) 30 spring breeding birds per square mile (males and females) by the year 2005 when weather, predation life cycles, or other natural factors permit.

Birds A3. Improve and maintain riparian habitat on the Missouri and Musselshell Rivers and other suitable riparian areas in good to excellent condition to benefit waterfowl, kingbirds, mourning doves, American kestrels, ring-necked pheasants, and turkeys.

Birds A4. Over 15 years, maintain a minimum of two peregrine falcon eyries.

Birds A5. Over 15 years, improve waterfowl habitat so it is in good to excellent condition on all suitable ponds.

Rationale and Strategies for Bird A1–A5 (None)

Objectives for Birds, Alternative B

Birds B1. Within 4–6 years, complete a baseline inventory to determine the existing composition,

distribution and relative abundance of breeding and nonbreeding resident and migratory bird species using the refuge during each season of the year.

(Same as Birds C1 and D1.)

Birds B2. Within 7 years, establish a refugewide bird-monitoring program, and determine and describe sentinel plant associations and habitat requirements of 75 percent of high priority and sentinel bird species (species will be based on results of bird inventories).

Birds B3. Within 10 years, complete bird management plans for each of the four habitat types (upland, river bottom, riparian area, and shoreline) for resident, wintering, breeding, and migratory bird species with an emphasis on designated sentinel birds.

(Same as Birds C3 and D3.)

Rationale for Birds B1–B3. Establishing the known species is a first step in species conservation. This step will lead to species/habitat associations and adaptive management actions. Along with identifying species, knowledge of the numbers of birds in a population is needed as it can provide a benchmark from which management decisions can be measured. As management resources are always limited, accurate information gathered on species and relative abundance allows for prioritization of time and money when assessing which species are at greatest risk of decline.

The land base within the refuge has never had a comprehensive baseline inventory of bird species present throughout the different seasons of the year. Baseline inventory data and conducting monitoring on wildlife refuges is essential for identifying conservation targets, detecting climate-related system changes, identifying vulnerable species and habitats, and evaluating management choices (Defenders of Wildlife 2008).

Bird monitoring, if done correctly, can quantify the status of bird populations, measure trends or changes in status, reveal effects of natural or human-induced changes, and aid in the development and evaluation of management decisions (Lambert et al. 2009).

Sentinel birds, like sentinel plants, are those species first to decline at both poles of environmental processes. Herbivory, fire, flooding, and climate changes, as well as any combinations of these processes, can have an impact on bird species and abundance. Potential sentinel bird species follow:

- Grassland and shrub-steppe: grasshopper sparrow, Baird’s sparrow, long-billed curlew, upland sandpiper, mountain plover, lazuli bunting, chestnut-collared longspur, burrowing owl, greater sage-grouse, sharp-tailed grouse, Brewer’s sparrow
- Conifer grassland mosaic: sharp-tailed grouse, western tanager

- River bottom: northern flicker, yellow warbler, Bullock's oriole
- Riparian area: sora, American kestrel, yellow-breasted chat, least flycatcher, red-headed woodpecker
- Shoreline: piping plover, spotted sandpiper, bald eagle



Dave Menke/USFWS

Western Tanager

Strategies for Birds B1–B3

- Conduct point count surveys across the refuge for 3 years, six times each year.
- Conduct migration walks across the refuge for 3 years during each migration season.
- Conduct fall and early winter raptor surveys across the refuge for 3 years.
- Conduct night surveys to detect owls and nightjar species across the refuge for 3 years.
- Conduct river survey via boat for shoreline and river corridor species across the refuge for 3 years.
- Work with partners and gather historical data to add to the inventory data base.
- Develop a data management system including a GIS database for recording bird sightings.

- Within 4 years, establish and complete breeding bird surveys on the refuge for a baseline inventory.
- Within 4 years, establish and complete walking routes based on habitat types for a baseline inventory.
- Annually participate in State and national bird surveys such as owl surveys, nightjar surveys, raptor surveys, and resident bird surveys with the addition of habitat and management information in each of the four general habitat types on the refuge.
- Incorporate all habitat and management information into a data management system.
- Implement a study to determine the habitat needs of select sentinel birds from each of the refuge's four habitat types (including evaluating the influence of herbivory and fire and the abundance and distribution of each species for each season of the year.
- Implement a vegetation monitoring program to assess if each chosen sentinel bird's habitat requirements are being met during each season of the year.

Objectives for Birds, Alternative C

Birds C1. Same as Birds B1 and D1.

Birds C2. Within 7 years, establish a refugewide bird monitoring program and determine and describe sentinel plant associations and habitat requirements of 50 percent of high-priority and sentinel bird species (species will be based on results of bird inventories).

Birds C3. Same as Birds B3 and D3.

Birds C4. Within 5 years, determine greater sage-grouse and sharp-tail grouse distribution, nesting densities and nesting success in upland prairie areas of the refuge and relate these to the effects of management alternatives (burning and grazing) and sentinel species.

Rationale for Bird C1–C4. Same as B, plus prairie grouse such as sharp-tailed and greater sage-grouse have relatively large home ranges and require vast acreages of quality grassland to sustain their populations. Because these grassland birds are year-round residents they can easily be designated as flagship species for other grassland birds (Vodehnal and Hauffer 2007). Currently, greater sage-grouse are listed on the Montana Natural Heritage list as a State of Montana species of concern and are also listed as sensitive on both BLM and U.S. Forest Service species status lists (MFWP 2010). Although sharp-tailed grouse are not currently listed on any agency status lists, historical records show a marked decrease in this prairie grouse species.

Prairie grouse species evolved with a diversity of ecological communities that were formed by two

main influences—many different ecological sites and the disturbances (fire and grazing by native species) on these ecological sites. Restoring and keeping prairie grouse species as well as other high priority grassland species means understanding, managing, and restoring this diverse grass and shrub ecosystems (Vodehnal and Hauffer 2007).

Strategies for Bird C1–C4

- Within 2 years, establish and complete five new breeding bird surveys on the refuge for a baseline inventory.
- Within 3 years, establish and complete permanent walking routes based on the four habitat types for a baseline inventory.
- Annually participate in State and national bird surveys such as owl surveys, nightjar surveys, raptor surveys, and resident bird surveys with the addition of habitat and management information in each of the four general habitat types on the refuge.
- Incorporate all habitat and management information into a data management system.
- Within 2 years, work with partners to refine the current monitoring program for greater sage-grouse and sharp-tailed grouse, and continue yearly monitoring of both species.
- Within 5 years, determine, inventory, and monitor current dancing ground, nesting, brood-rearing, foraging and fall/winter habitat needs on a year-round basis for both species including habitat/management information in each of the four general habitat types on the refuge.
- Develop a data management system including a GIS database for recording bird sightings.

Objectives for Birds, Alternative D

Birds D1. Same as Birds B1 and C1.

Birds D2. Within 7 years, establish a refugewide bird-monitoring program and determine and describe sentinel plant associations and habitat requirements of 90 percent of high priority and sentinel bird species (species will be based on results of bird inventories).

Birds D3. Same as Birds B3 and C3.

Birds D4. Same as Birds C4.

Rationale and Strategies for Birds D1–D4 (Same as B)

WILDLIFE—OTHER WILDLIFE

Many species of invertebrates, amphibians, reptiles, fish, and small mammals are found on the refuge and serve as key indicators in evaluating the environmental health of the ecosystem.

Objectives for Other Wildlife, Alternative A

There are no objectives under alternative A.

Objectives for Other Wildlife, Alternative B

Other Wildlife B1. Within 1–2 years, assess the need for baseline inventory plans, surveys, or research for fish, reptiles, amphibians, invertebrates, or other small mammals found on the refuge. Prioritize the highest needs (for example, top 7–10) particularly those that support or are tied to the monitoring efforts for upland, river bottoms, and riparian objectives. Within 5 years, initiate and/or complete inventory plans or baseline surveys for about 30–50 percent of the highest priority needs. Over 15 years, complete 75–100 percent of the top 10 priorities. Prioritize monitoring needs based on sentinel species that support habitat goals and objectives or climate change effects.

(Same as Other Wildlife C1 and D1.)

Rationale for Other Wildlife B1. Limited information is available on the diversity of fish, reptiles, amphibians, invertebrates, and other small mammals such as bats and rodents that are found on the refuge including the composition and distribution of these species. As part of implementing the objectives for uplands, river bottoms, and riparian areas, baseline information or additional survey work is needed to monitor and evaluate the success of the habitat objectives. While the need for understanding baseline information is important for the habitat monitoring effort, funding limitations and other staff priorities necessitate that these plans and surveys are prioritized and coordinated with MFWP, including obtaining necessary permits.

The Missouri River Breaks provide unique habitats for the many nongame species including fish, amphibians, invertebrates, and small animal in the northern plains due to the topographic features and forest outliers present. This region has not had a comprehensive baseline inventory of species present. Establishing the species present is the foundational first step in species conservation. This step will lead to species/habitat associations and adaptive management actions that are tied to the habitat objectives.

Because terrestrial small mammals have limited distributions, small home ranges, and require relatively high densities to maintain viable populations (Silva 2001), they are susceptible to population declines resulting from habitat degradation or loss at many scales, including local disturbances (Van Dyke 2003, Gaines et al. 1997, Rossenberg et al. 1997). However, detailed data concerning specific habitat influences on abundance and distribution are lacking, and this limits the ability of managers to effectively sustain healthy populations across the landscape.

Important habitats for plants and animals can be restricted or otherwise modified by prescribed fire, rotational grazing, or other types of habitat management such as thinning, reseeding, and chemical or mechanical weed control. Because populations can be sampled relatively easily, small mammal communities are often used as indicators for monitoring ecosystem responses to habitat restoration and management (Douglass 1984, Olson et al. 1994). As a prerequisite of using small mammals in such a conservation program, however, it is critical to identify and understand the structure and composition of small mammal communities in areas exposed to management.

(Same as D.)

Strategies for Other Wildlife B1 (*Same as D*)

- Conduct stream surveys based on refuge priorities (functioning and nonfunctioning streams) using qualified aquatic ecologists versed in prairie stream survey techniques and methods.
 - Work in partnership with Federal, State, non-governmental organizations and others to write management plans and incorporate other plans or planning efforts such as the Missouri River Fish Management Plan, strategic habitat conservation and land conservation cooperatives, and the Montana Fish and Wildlife Conservation Strategy.
 - Document fish inhabiting the refuge's ephemeral, intermittent, and perennial streams using Bramblett and Zale (1999) as a baseline.
 - In cooperation with BLM, restore degraded riparian areas by limiting expansion of existing stock ponds or limiting additional stock ponds and other water developments.
 - Remove fish passage impediments such as culverts, grade control structure, or diversion structures on case-by-case basis.
 - Develop habitat management strategies to preserve and enhance populations of nongame species on the refuge. These strategies will include detailed prescriptions for habitat management, protocols to monitor the status of these species, and methods to evaluate the effectiveness of management actions.
 - Hire additional refuge staff and encourage universities or other organizations to conduct surveys on the effects of public use, wildfire (wildfire and prescribed fire), and other management strategies throughout the calendar year on a yearly basis to determine changes in use.
 - Establish standardized reporting methods for incidental sightings to include: species, date, property, specific location, and habitat type, as minimum information, and size, sex, and age data as additional information where possible.
- Develop and maintain a GIS database for the refuge used to record distribution and locations of incidental sightings of all nongame species.
 - Continue to monitor and identify nongame species with limited distribution or specific habitat requirements (for example, snake den sites, bat rookery or roosting sites) on the refuge using three-year rotation surveys.

Objectives for Other Wildlife, Alternative C

Other Wildlife C1. Same as Other Wildlife B1 and D1.

Other Wildlife C2. Over 15 years, place a management emphasis on those species of fish, amphibians and reptiles that are of recreational interest.

Other Wildlife C3. Over 15 years, work with partners to enhance populations of paddlefish and increase fishing opportunities by stocking livestock ponds and reservoirs that will support a fisheries.

Rationale for Other Wildlife C1–C3. Same as B and D, plus in 2006 recreational sport fishing to the refuge contributed 2.1 million dollars in revenue to local communities (Carver and Caudill 2007). Providing additional fishing opportunities should increase recreational fishing visits to the area. Restoring riparian areas with native reptiles and amphibians will promote ecological health of the area. The secondary benefit of this restoration will promote diversity of other wildlife, which will lead to additional wildlife-viewing opportunities.

Strategies for Other Wildlife C1–C3 (*Same as B and D*)

Objectives for Other Wildlife, Alternative D

Other Wildlife D1. Same as Other Wildlife B1 and C1.

Rationale for Wildlife D1 (*Same as B*)

Strategies for Wildlife D1 (*Same as B and C*)

THREATENED and ENDANGERED SPECIES and SPECIES OF CONCERN

Threatened and endangered species of importance that are found on the refuge are: black-footed ferret (endangered), least tern (endangered), pallid sturgeon (endangered), and piping plover (threatened). This section also addresses grizzly bear (threatened) and gray wolf (endangered), which are not currently found on the refuge but could migrate with the 15-year period. In addition, there are objectives for the following species of concern for the refuge: black-tailed prairie dog, greater sage-grouse, mountain plover, burrowing owl, sicklefin chub, sturgeon chub, and northern leopard frog.



USFWS

Endangered Black-footed Ferret

Objectives for Threatened and Endangered Species (TES) and Species of Concern, Alternative A

TES and Species of Concern A1 (black-footed ferret). Maintain habitat for and reintroduce a minimum of six pairs of black-footed ferrets on six or more prairie dog towns when animals are available.

TES and Species of Concern A2 (black-footed ferret). Over 15 years, continue the black-footed ferret recovery effort including releasing animals, intensive monitoring, and disease and habitat management.

TES and Species of Concern A3 (black-footed ferret). Maintain viable prairie dog towns totaling no less than 5,000 acres and no more than 10,000 acres on suitable areas with sizes and patterns desirable for black-footed ferrets.

Rationale and Strategies for TES and Species of Concern A1–A3 (None)

Objectives for TES and Species of Concern, Alternative B

TES and Species of Concern B1 (black-footed ferret). Over 15 years, continue to provide technical and scientific assistance where possible in black-footed ferret recovery to State, conservation organizations and private landowners interested in black-footed ferret recovery.

(Same as TES and Species of Concern C1 and D1.)

TES and Species of Concern B2 (black-footed ferret). Continue monitoring of the existing UL Bend population and consider additional releases of captive-reared ferrets for useful purposes.

(Same as TES and Species of Concern C2 and D2.)

Rationale for TES and Species of Concern B1–B2 (black-footed ferret). By itself, the refuge lacks the habitat potential to produce sufficient prairie dog acreage to support a self-sustaining black-footed ferret population. Because of this, it was always anticipated that the refuge would play a minor role (10 percent) in providing viable black-footed ferret habitat in Phillips County. For a variety of reasons, those expectations have not been fulfilled.

The Service has worked hard actively releasing and monitoring ferrets at UL Bend since 1994. The refuge also built a captive rearing and preconditioning facility near Malta that was operated for several years, but has now been abandoned. The refuge staff have also assisted with ferret reintroductions and monitoring on BLM lands, on the Fort Belknap Indian Reservation and on the Northern Cheyenne Indian Reservation.

A self-sustaining ferret population has yet to be established in Montana. MFWP is the leader in prairie dog conservation in Montana and the refuge staff will collaborate with them on ferret recovery activities where possible.

(Same as D.)

Strategies for TES and Species of Concern B1–B2 (black-footed ferret)

- Cooperate with adjacent land managers to maintain, expand, and protect prairie dog colonies in configurations capable of supporting a viable black-footed ferret population. Continue providing monitoring, management and research expertise from refuge staff.
- Provide technical and scientific expertise to State, counties, and other landowners interested in black-footed ferret recovery efforts on their lands.

TES and Species of Concern B3 (least tern). Over 15 years, work with the USACE to maximize suitable nesting habitats that are attractive to least terns with the goal of maximizing annual productivity to promote recovery.

(Same as TES and Species of Concern D3.)

TES and Species of Concern B4 (piping plover). Over 15 years, work with the USACE to maximize suitable nesting habitats that are attractive to piping plovers with the goal of maximizing annual productivity to promote recovery.

(Same as TES and Species of Concern C4 and D4.)



Gene Nieminen/USFWS

Piping Plover

Rationale for TES and Species of Concern B3–B4. Certain areas of the reservoir (certain islands and shorelines) tend to be more attractive to nesting least terns and piping plovers. Once identified, it may be practical to manage those habitats to ensure their continued suitability. Recognizing that reservoir levels vary greatly, it may only be feasible to identify sites that, in most successive years, are attractive and available to these species. (Same as D.)

TES and Species of Concern B5 (pallid sturgeon). Over 15 years, work cooperatively with MFWP and other partners along the Missouri River to develop management actions (in compliance with recovery plan) to benefit pallid sturgeon populations.

(Same as TES and Species of Concern C5 and D5.)

TES and Species of Concern B6 (pallid sturgeon). Over 15 years, work cooperatively with partners to monitor populations of pallid sturgeons.

(Same as TES and Species of Concern C6 and D6.)

TES and Species of Concern B7 (grizzly bear). Over 15 years, develop a grizzly bear management plan, in cooperation with MFWP, for managing grizzly bears that could naturally colonize the refuge.

(Same as TES and Species of Concern C7 and D7.)

Rationale for TES and Species of Concern B7 (grizzly bear). This refuge-specific plan is being developed in case grizzly bear naturally recolonize the refuge. The philosophy of the plan under this alternative would be toward promoting grizzly bear abundance (within ecological constraints) and providing for recreational

(viewing) opportunities. Grizzly bears would provide natural predation pressure on large ungulates and influence movements around the refuge.

Strategies for TES and Species of Concern B7 (grizzly bear)

- Work with MFWP and others to document grizzly bear presence on the refuge and to monitor abundance, distribution, and population trends if grizzly bears become established, and work to educate user groups about the ecological role grizzly bears play in the environment.
- On a case by case basis, approved agents could be permitted to remove grizzly bears that are documented depredating livestock.
- Promote, help sponsor, and conduct research on grizzly bears ecology in the Missouri River Breaks.
- No hunting season for grizzly bears on the refuge would be established if grizzly bears are delisted.

TES and Species of Concern B8 (gray wolf). Within 4 years, develop a refuge-specific wolf management plan in cooperation with MFWP that follows the Northern Rockies Gray Wolf Recovery Plan.

(Same as TES and Species of Concern C8 and D8.)

Rationale for TES and Species of Concern Gray Wolf B8. Wolves were reintroduced into Yellowstone National Park in 1995 and steadily increased in numbers to an estimated population at the end of summer 2008 of 497. There are an estimated 34 breeding pairs in Montana (MFWP 2009e).

This refuge-specific plan would be developed in case wolves naturally recolonize the refuge. Wolves would provide natural predation pressure on large ungulates that may help to balance sex and age ratios and influence movements around the refuge.

(Same as C and D.)

Strategies for TES and Species of Concern Gray Wolf B8
(Same as C and D)

- Work with MFWP and others to document wolf presence on the refuge and to monitor abundance, distribution, and population trends if wolves become established, and work to educate user groups about the ecological role wolves play in the environment.
- Collaborate with others to educate the public and refuge users about the ecological role wolves play in the environment.
- On a case-by-case basis, wolves that are documented depredating livestock would be removed.
- Promote, help sponsor and conduct research on wolf ecology in the Missouri River Breaks.
- No hunting season for wolves on the refuge would be established.

TES and Species of Concern B9 (black-tailed prairie dog). Over 15 years, continue protection, restoration and expansion of black-tailed prairie dog populations refuge-wide to maximize occupancy of potential habitat.

(Same as TES and Species of Concern C9 and D9.)

TES and Species of Concern B10 (black-tailed prairie dog). Work with MFWP, conservation organizations and neighbors to implement the State black-tailed prairie dog management plan and work to establish at least two 5,000-acre complexes that could support black-footed ferrets in which the refuge could contribute to the larger complex.

(Same as TES and Species of Concern C10 and D10.)

TES and Species of Concern B11 (black-tailed prairie dog). GPS map all black-tailed prairie dog colonies on the refuge every 3 years (if funding and personnel allow). Continue with research, monitoring, and treatment.

(Same as TES and Species of Concern D11.)

Strategies for TES and Species of Concern B9–B11 (black-tailed prairie dog)

- Within 3 years, map and rank the quality of all potential and existing prairie dog habitats.
- Promote expansion by mechanically removing vegetation, targeted prescriptive grazing and fire.
- Coordinate with MFWP and others on how the refuge could best contribute to conservation of prairie dogs and associated species.
- Use current disease (plague) management tools and translocation procedures (Truett et al. 2001, Dullum et al. 2005) to promote prairie dog population growth and persistence in desired areas.
- Continue research and field trials on existing and developing plague management tools.

TES and Species of Concern B12 (greater sage-grouse). Within 2 years, using MFWP's sage-grouse core area map and existing research projects, delineate areas of the refuge that are of high importance to sage grouse. Gear proposed actions and responses to wildfires to minimize short-term impacts and maximize long-term benefits for sage-grouse and other sage-steppe associated species.

(Same as TES and Species of Concern C12 and D12.)

Strategies for TES and Species of Concern B12 (greater sage-grouse)

- Using existing lek locations and existing research telemetry data, combined with the many available GIS data layers, map and model sage-grouse habitat and rank its quality.
- Identify existing and potential threats to sage-grouse habitat and develop remedies

TES and Species of Concern B13 (mountain plover). Over 15 years, continue to promote prairie dog towns to provide habitat for mountain plovers and other prairie dog-dependent species.

(Same as TES and Species of Concern C14 and D13.)

Strategies for TES and Species of Concern B13 (mountain plover)

- The strategy for mountain plover conservation is to promote persistence and expansion of prairie dog colonies, especially those on ridges and with gravelly substrates, as such sites appear more attractive as nesting habitat for mountain plovers. See also section on management of black-tailed prairie dogs that provide habitat for nesting mountain plovers in certain areas.
- Design and conduct at least every 3 years, population surveys for mountain plovers.

TES and Species of Concern B14 (sicklefin chub and sturgeon chub). Over 15 years, work with MFWP and other partners to improve monitoring of rare fish (sicklefin chub and sturgeon chub) and develop management actions to benefit pallid sturgeon populations.

(Same as TES and Species of Concern C15 and D14.)

Rationale for TES and Species of Concern B14. The sicklefin chub was petitioned for listing under the Endangered Species Act in 1994 and is currently a Category 1 species, meaning there are sufficient data to support a listing proposal. It has been documented in the Missouri River above Fort Peck Reservoir, but little is known about its abundance or distribution. The Montana Chapter of the American Fisheries Society reports that the sturgeon chub is relatively common and widespread in eastern Montana and populations appear relatively secure. The refuge has spent little effort on rare fish, but is willing to work with others on their conservation. Neither of these species was encountered during a 1999 fishery of several streams on the refuge conducted by Robert Bramblett and Alexander Zale (1999). (Same as D.)

Strategies for TES and Species of Concern B14 (sicklefin chub and sturgeon chub)

- Meet with MFWP fishery staff to discuss the status of these fish species and what actions the refuge might consider for better management of them.

TES and Species of Concern B15. Over 15 years, protect, conserve, and enhance populations of special status species where the refuge and partners can make significant contributions to recovery efforts on the refuge. Give priority to species that are listed federally or by the State of Montana.

(Same as TES and Species of Concern D15.)

Rationale for TES and Species of Concern B1–B15. The Service manages threatened and endangered species as trust species and is responsible for assisting in the recovery of these species that occur within the Refuge System. To implement effective management for the protection and recovery of threatened and endangered species, a major goal of the Refuge System is to develop priorities for refuge management among species. Prioritization is important because limitations in funding and staff time prevent targeting all special status species for management. Limited resources are allocated, in part, through inventories of special status species and prioritization of management needs.

Consistent with the theme of alternative B, resources would be directed toward maintaining, and enhancing where appropriate, population levels to the maximum extent possible and practicable for these special status species.

The northern leopard frog is currently being considered for listing under the Endangered Species Act. Refuge staff has observed them in several places, but no standardized monitoring has ever been done. The refuge staff currently assists with the large-scale North American Amphibian Monitoring Program and a refuge-specific monitoring strategy would be patterned after those efforts.

(Same as D.)

Strategies for TES and Species of Concern B1–B15

Same as C and D, except as noted:

- By 2014, evaluate and prioritize the special status species that occur on the refuge to determine which species require active management and the level and type of management needed. Criteria for prioritization will include listing status, implementation of actions identified in recovery plans, status within Montana, population size on the refuge, threats to survival, sensitivity to disturbance, and the ability of the refuge to contribute to recovery or conservation of the species.
- By 2015, compile all field surveys, literature, historical records pertaining to the special status species that occur on the refuge. Incorporate MFWP Comprehensive Fish and Wildlife Conservation Strategy whenever possible.
- By 2016, develop habitat management strategies to preserve and enhance populations of high-priority special status species on the refuge. These strategies will include detailed prescriptions for habitat management, protocols to monitor the status of these species, and methods to evaluate the effectiveness of management actions. The effects of public use on special status species will also be monitored. The strategies will cover federally listed species such as the black-footed ferrets, piping plover, least tern, and pallid sturgeon.
- Over 15 years, encourage research by refuge staff, graduate students or other organizations on priority special status species to better understand and promote their conservation. Continue to assist USACE with historical plover and tern surveys so that the survey data remains consistent.
- Within 5 years, work with Ecological Services branch to identify areas of critical habitat for endangered species and species of concern. Prescribed fire could be used in these areas to achieve specific resources objectives as long as there were not significant impacts. These areas would be identified in the fire management plan as areas of special concern and would be protected from wildfire.
- Collaborate with other interested parties and secure funds to hire additional seasonal employees to conduct amphibian monitoring and turtle monitoring.
- See riparian section for strategies to improve riparian habitats that would benefit amphibians.

Objectives for TES and Species of Concern, Alternative C

TES and Species of Concern C1–C2 (black-footed ferret). Same as TES and Species of Concern B1–B2 and D1–D2.

Rationale and Strategies for TES and Species of Concern C1–C2 (black-footed ferret) (*Same as B and D*)

TES and Species of Concern C3 (least tern). On plan approval, and depending on lake levels, work with the USACE to maintain suitable least tern nesting habitats.

TES and Species of Concern C4 (piping plover). Same as TES and Species of Concern B4 and D4.

Rationale and Strategies for TES and Species of Concern C3–C4 (least tern and piping plover)

Same as B and D, except:

- Do not restrict livestock grazing on beaches beyond current levels.

TES and Species of Concern C5–C6 (pallid sturgeon). Same as TES and Species of Concern B5–B6 and D5–D6.

TES and Species of Concern C7 (grizzly bear). Same as TES and Species of Concern B7 and D7.

TES and Species of Concern C8 (gray wolf). Same as TES and Species of Concern B8 and D8.

Rationale and Strategies for TES and Species of Concern C7–C8 (grizzly bear and gray wolf) (*Same as B and D*)

TES and Species of Concern C9–C10 (black-tailed prairie dog). Same as TES and Species of Concern B9–B10 and D9–D10.

TES and Species of Concern C11 (black-tailed prairie dog). GPS map all prairie dog colonies on the refuge every 5 years.

Rationale and Strategies for TES and Species of Concern C9–C11 (black-tailed prairie dog)

Same as B and D, plus:

- Continue attending Montana and local prairie dog management meetings and help MFWP implement their conservation plans.

TES and Species of Concern C12 (greater sage-grouse). Same as TES and Species of Concern B12 and D12.

TES and Species of Concern C13 (greater sage-grouse). Identify two leks near each field station suitable for public viewing (refer to public use objectives).

TES and Species of Concern C14 (mountain plover). Same as TES and Species of Concern B13 and D13.

TES and Species of Concern C15 (sicklefin chub and sturgeon chub). Same as TES and Species of Concern B14 and D14.

Rationale and Strategies for TES and Species of Concern C15 (sicklefin chub and sturgeon chub) (Same as B and D)

TES and Species of Concern C16. Over 15 years, protect, conserve, and enhance populations of special status and their habitats. Priority will be given to species that are State or federally listed. Expand on those opportunities to provide public view of special status species and other wildlife-dependent recreation.

Rationale for TES and Species of Concern C1–C16. Same as B, plus there is less emphasis on habitat and population recovery/monitoring and more emphasis on getting the public involved in wildlife-dependent recreational activities associated with these spe-

cial status species (see objectives for Public Use and Education). Given the emphasis in this alternative, fewer resources would be spent on species recovery, but the Service would fulfill the legal and policy requirements for these species, and more emphasis on public use and enjoyment of these species.

Objectives for TES and Species of Concern, Alternative D

TES and Species of Concern D1–D2. Same as TES and Species of Concern B1–B2 and C1–C2.

TES and Species of Concern D3. Same as TES and Species of Concern B3.

TES and Species of Concern D4–D10. Same as TES and Species of Concern B4–B10 and C4–C10.

TES and Species of Concern D11. Same as TES and Species of Concern B11.

TES and Species of Concern D12. Same as TES and Species of Concern B12 and C12.

TES and Species of Concern D13–D14. Same as TES and Species of Concern B13–B14 and C14–C15.

TES and Species of Concern D15. Same as TES and Species of Concern B15.

Rationale for TES and Species of Concern D1–D15. Same as B, except: Maintenance, restoration and enhancement of special status species is essential to restoration of natural ecological processes, the theme of this alternative.

Strategies for TES and Species of Concern D1–D15 (Same as B)

OBJECTIVES for GOAL

Public Use and Education

PUBLIC USE—HUNTING

Hunting is permitted on the refuge for elk, mule deer, white-tailed deer, pronghorn, bighorn sheep, coyotes, waterfowl, and upland game birds. It is used both as a management tool for improving habitat conditions and as an appropriate and compatible wildlife-dependent recreational activity (refer to hunting compatibility determination in appendix C). In some areas of the refuge, big game hunting seasons and harvest quotas on the refuge could be more restrictive than State regulations. All other wildlife is protected. Trapping is not allowed.

Objectives for Hunting, Alternative A

Hunting A1. Within 2–5 years, develop a visitor services plan that includes a hunting plan.

(Same as Hunting B1, C1, and D1.)

Hunting A2. Over 15 years, maintain current hunting programs for ungulates, upland birds, waterfowl, and coyote and prohibit trapping.

Hunting A3. Over 15 years, continue to facilitate the hunting program by allowing access on open refuge roads, camping as designated under refuge rules, and boat access.

Rationale for Hunting A1–A3. Hunting has long been an important cultural and social component to the lands that make up the refuge. It is also an important tool for managing wildlife populations.

Interest in experiencing the natural and wild wonders of the area has been focused in large part on participating in a variety of hunting opportunities. The refuge would continue to provide for many quality and diverse hunting experiences.

This alternative would continue with the existing strategies as long as they are deemed compatible with refuge purposes.

Strategies for Hunting A1–A3

- Continue to respond to inquiries and provide information about current refuge hunting opportunities. (Same as B, C, and D.)
- Continue yearly review of refuge hunting regulations to ensure clarity and to address any emerging issues or concerns, and give the public an opportunity to review and comment on any changes. (Same as B, C, and D.)
- Continue to publish and/or update the refuge hunting regulations brochure to inform the public of hunting opportunities (including accessible opportunities) and refuge-specific regulations. (Same as B, C, and D.)
- Distribute the refuge's brochure more widely. (Same as B, C, and D.)
- Continue to prohibit most predator hunting except permit limited coyote hunting would be allowed (mid-October through March 1).
- Continue to prohibit trapping or shed hunting.



Brett Billings/USFWS

Hunting is one of the most popular activities on the refuge.

- Continue to monitor boat use for accessing hunting areas along the river to ensure that wildlife species utilizing the habitat along the river are not negatively affected over the long term. (Same as B, C, and D.)
- Continue to permit camping within 100 yards of roads to facilitate harvest opportunities. (Same as C and D.)

Objectives for Hunting, Alternative B

Hunting B1. Same as Hunting A1, C1, and D1.

Hunting B2. Over 15 years, continue to facilitate the hunting program by allowing access on open refuge roads, horseback riding, camping as designated under refuge rules, and boat access.

Hunting B3. Within 5 years, work with partners to create diverse and quality hunting opportunities on the refuge that represent a diversity of all age classes. By year 5, 60–70 percent of hunters report a reasonable harvest opportunity and satisfaction with the overall experience.

Hunting B4. Within 5 years, evaluate the demand for additional access for hunters with mobility impairments. If warranted, by year 10 provide one additional hunting access for hunters with mobility impairments.

Hunting B5. Working with MFWP and within the State's hunting-season framework, within 4 years, expand opportunities for young people to hunt with at least one new hunt that is only available to young hunters.

Hunting B6. Over 15 years, maintain the furbearer hunting policies as found in alternative A (no trapping and wildlife is protected).

Hunting B7. Over 15 years, work with MFWP to increase hunting opportunities by opening additional populations (i.e., bighorn sheep that have expanded to new areas).

Rationale for Hunting B1–B7. Similar to A, except hunting activities are primarily focused on strategies associated with maximizing wildlife populations within the capacities of healthy habitats.

For many hunters, unique hunting opportunities on the refuge could be the result of mature bull elk in the 8- to 10-year class, where a population of mule deer that can reach 8 years and bighorn sheep that may reach the age of ten. Some natural fluctuations of population age structure would occur due to random events, but overall representative age classes would be available to refuge visitors. Some game animals of both male and female would be expected to die from old age.

Strategies for Hunting B1–B7

- Adopt MFWP hunting seasons and regulations for those species for which harvest is currently allowed (except for mule deer) on the refuge (elk, white-tailed deer, and pronghorn). Continue with the 3-week mule deer season or consider other alternatives until buck-to-doe ratio as identified in wildlife objectives is achieved.
- Work with the MFWP to determine the appropriate hunting permit levels for elk for achieving habitat objectives related to herd populations and herd composition. Both biological integrity and landowner tolerance need to be taken into account when setting permit levels for elk.
- Evaluate hunting district 652 (mule deer buck special-draw area) for mule deer home ranges, hunting district size, harvest strategy, permit numbers, habitat quality, and access and assess effects on management objectives.
- Initiate tooth annual study/survey to evaluate age structure for all hunted species.
- Within 2–5 years, complete a survey on user preferences and include questions needed to evaluate big game harvest on the refuge.
- Use annual wildlife surveys, car count data, and trail cams to monitor and evaluate hunting use.
- Evaluate motorized access for hunting and make determination of implementing seasonal road closures to promote quality walk in hunting opportunities or retrieval roads to promote harvest in remote areas of the refuge.
- Through visitor contact and hunting information, encourage hunters to walk in to hunt.
- If deemed necessary due to increasing hunting pressure and over harvest of certain species, implement a refuge permit system to control the number of hunters.
- Work with the State to establish and coordinate hunter days or events for hunters with special needs.
- Work cooperatively with MFWP to conduct law enforcement patrols at the refuges to ensure compliance.
- Develop a policy for addressing tree stand use on the refuge. Address number of stands permitted, timeframe that can be up and how many days before, during or after a hunt.
- Require nontoxic shot for all bird hunting to reduce the incidental poisoning of nontarget wildlife.
- Work with the State of Montana to establish a special, permitted, weekend hunt for elk and deer in all hunting districts covering the refuge that is only available to young hunters.

Strategies for Hunting B2 (boat use and camping)

- Continue to monitor boat use for accessing hunting areas along the river. (Same as A, C, and D.)
- Working with USACE and others, begin monitoring the amount of boat access occurring in popular hunting areas. If monitoring shows that increased access is negatively affecting wildlife populations using river bottom areas, make recommendations and work with users to reduce the impacts (for example, limit motor size or number of boats allowed on river).
- Continue to permit minimally disturbing, pack-in/pack-out backcountry camping throughout the entire refuge.
- Allow visitors to drive within 50 yards of public use roads to access campsites for wildlife-dependent recreational activities.
- Within 5 years, designate the most popular public use areas for camping and harden those sites to minimize erosion and impacts on habitat.
- If an area is overly affected by camping implement temporary closures or create hardened access points.
- Work with USACE to evaluate the need for horse camps at popular recreation areas or wilderness study areas.
- Define current camp areas along the river to prevent campground creep into the riparian habitat.
- Allow boat camping along the beaches of the lakeshore.
- Continue working with USACE to restrict boat camping from the islands in the river.

Strategies for Hunting B4 (hunters with mobility impairments)

- Work with partners (such as Wheeling Sportsmen and Wilderness on Wheels) to improve the current accessible blind in the Sand Creek Unit.
- Identify where potential accessible sites are needed and where they could be developed if the demand arises.
- Increase outreach about the refuge's accessible hunting opportunities by developing a one-page tear sheet that explains the accessible hunting opportunities and facilities. Post information on the website.

Objectives for Hunting, Alternative C

Hunting activities are primarily focused on those legitimate strategies that also provide an economic benefit to local communities.

Hunting C1. Same as Hunting A1, B1, and D1.

Hunting C2. Over 15 years, continue to facilitate the hunting program by allowing access on open refuge

roads, camping as designated under refuge rules, and boat access.

Hunting C3. Within 5 years, in combination with achieving the habitat objectives already defined, work with partners to create hunting opportunities on the refuge that are not achieved on other public lands, including harvesting big game animals that represent all age classes. By year 7, 70–85 percent of hunters report a reasonable harvest opportunity and satisfaction with the overall experience.

Hunting C4. Within 5 years, provide two additional hunting accesses for hunters with mobility impairments.

Hunting C5. Within 4 years, expand opportunities for young people (under 17 years old) to hunt with at least one new hunt each in areas 400, 600, and 700 that are only available to young hunters, in conjunction with MFWP.

Hunting C6. Over 15 years, if supported by a monitoring program, adopt MFWP harvest strategies and opportunities for hunting and/or trapping furbearing species regulated by MFWP (muskrat, mink, and bobcat) and not regulated by MFWP (red fox, coyote, raccoon, and badger; but excluding least weasel, long-tailed weasel, and striped skunk).

Hunting C7. Same as Hunting B7.

Rationale for Hunting C1–C7. Similar to A, except the refuge would look to expand opportunities for all hunters including youth and hunters with mobility impairments. Increasing hunting and trapping opportunities on the refuge and promoting the refuge's hunting program will increase license sales for MFWP and boost economic activity in the surrounding communities. This could increase the value of leased private lands within and adjacent to the refuge. Additionally, this could increase leases values of State lands within the refuge that can be acquired by outfitters who have a permit to operate on the refuge.

Providing that monitoring supports allowing for a harvest, the Service would cooperate with MFWP to open up hunting or trapping opportunities for furbearer species both regulated (muskrat, mink, and bobcat) and unregulated (red fox, coyote, raccoon, and badger) that are not currently open to hunting or trapping. For big game, the Service would also cooperate with the State to maximize the number of cow elk tags when the numbers are above objective levels and not restrict antlerless mule and whitetail deer tags. As the bighorn sheep population expanded in areas where they were reintroduced, this would provide additional harvest opportunities.

Through promotions and information, more hunters would be encouraged to hunt on the refuge,

which in turn could provide for more economic benefit to the local communities. Although there could be more hunters than what is currently found in alternative A, it is anticipated that the vast majority will report satisfaction with their overall experience.

Strategies for Hunting C1–C7

- Adopt MFWP hunting seasons and regulations for those species for which harvest is currently allowed (except for mule deer) on the refuge (elk, white-tailed deer, pronghorn). Continue with a 3-week mule deer season until buck-to-doe ratio identified in wildlife objectives is achieved. (Same as B.)
- Use annual wildlife surveys, hunter surveys, car count data and trail cams to monitor and evaluate hunting use. (Same as B.)
- Develop a policy for addressing tree stand use on the refuge. Address number of stands permitted, timeframe that can be up—how many days before, during or after a hunt. Make policy less restrictive than alternative B.
- Work with the State of Montana to establish a special, permitted, weekend hunt for elk and deer in all hunting districts that is only available to young hunters.
- Maximize cow elk tags when numbers are above population objectives, allowing A9/B12 to be valid on the refuge and not restricting antlerless mule deer and whitetail deer tags on the refuge.
- Develop hunt packages to create harvest opportunities for those species present, but not currently open to hunting if biologically supported (mountain lion, moose, and black bear).
- If wolves arrive and establish a resident refuge population that a refuge biologist determines is huntable, consider establishing a limited wolf-hunting season.
- Increase outreach to hunters and create more outlets for promoting hunting opportunities on the refuge to outside audiences.
- Create new partnerships, and maintain and expand existing partnerships with hunters and hunter groups to increase awareness of hunting opportunities and the habitat conservation.
- Require nontoxic shot for all bird hunting to reduce the incidental poisoning of nontarget wildlife.

Strategies for Hunting C2 (boat use and camping)

- Continue to monitor boat use for accessing hunting areas along the river. (Same as A, B, and D.)
- Within 5 years, designate and develop camping areas to accommodate the number of recreationists to the refuge. Include conveniences such as location to the river for easier access, pit toilets, and possibly tie-downs for horse camps.

- Continue to restrict all camping to within 100 yards of a numbered route. (Same as A and D.)
- If an area is overly affected by camping implement temporary closures or create hardened access points. (Same as B.)
- Work with USACE to evaluate the need for horse camps at popular recreation areas or wilderness study areas. (Same as B.)
- Harden current camp areas along the river to prevent campsite creep into the riparian areas.
- Cooperate with USACE to allow camping on river islands and along the beaches of the lakeshore.
- Within 5 years, evaluate the potential effects of camping within the islands along the Missouri River corridor.

Strategies for Hunting C4 (hunters with mobility impairments)

Same as B, plus:

- Restrict access by others at specific times to increase harvest opportunities for hunters with mobility impairments.
- Allow motorized vehicle access on seasonally closed roads for impaired hunters.
- Allow priority access to accessible blind to impaired hunters.
- If a demand is identified, develop a second accessible blind.
- Plant crops to attract more wildlife and increase harvest opportunities.

Strategies for Hunting C5 (young hunters)

- Hunting opportunities for young people will be expanded to include hunting district 417, 410, and 700 to recruit young hunters and promote a quality opportunity for young hunters (2015 biannual season setting process).

Strategies for Hunting C6 (trapping)

- Develop trapping packages to allow trapping of furbearers on the refuge that are regulated by MFWP. Do not permit trapping of beaver and swift fox.
- Require all furbearer trappers on the refuge to tag all traps with proper identification and report harvest within 30 days after the end of the season.
- Develop trapping packages to allow trapping of red fox, coyotes, raccoon, and badgers on the refuge.
- Develop hunting packages for badger, raccoon, and red fox to allow shooting these species on the refuge.
- Adjust current regulations to allow coyote hunting year-round on the refuge.
- Provide outreach to all visitors to advise them of where trapping is allowed.

Objectives for Hunting, Alternative D

Hunting D1. Same as Hunting A1, B1, and C1.

Hunting D2. Over 15 years, continue to facilitate the hunting program by allowing access on open refuge roads, camping as designated under refuge rules, and boat access.

Hunting D3. Within 5 years, work with MFWP and other partners to create diverse and quality-oriented hunting opportunities on the refuge, including harvesting big game animals that represent all age classes. By year 10, 65–75 percent of hunters report a reasonable harvest opportunity and satisfaction with the overall experience.

Hunting D4. Same as Hunting B4.

Hunting D5. Same as Hunting B5.

Hunting D6. Over 15 years, work with MFWP to consider the opportunity for limited hunting of furbearers and mountain lion, provided monitoring of wildlife and habitat indicates stable and growing populations.

Rationale for Hunting D1–D6. Under the Service’s wildlife-dependent recreation policy (FWS 2006c), providing for quality experiences is highlighted as an important component of a hunting program (605 FW1, 605FW2). Safety, reasonable opportunities for success, and working collaboratively with the State wildlife agencies are important elements that should be considered. Under alternative D a quality experience could mean participants could expect reasonable harvest opportunities, uncrowded conditions, fewer conflicts between hunters, relatively undisturbed wildlife, and limited interference from, or dependence on, mechanized aspects of the sport.

Big game hunting is popular on the refuge and, as a result, at times crowding is becoming an issue that potentially affects the quality of the hunting experience. Too many hunters in some areas could lead to unsafe hunting conditions and compromised harvest opportunities. With a growing number of private property acres off limits to hunting, pressure is intensifying on Service lands. To ensure a good-quality hunting experience, it would be essential to maintain healthy populations of resident wildlife and migratory birds (FWS 2006b), in part by achieving the habitat objectives identified previously. Additionally, there is interest of implementing new opportunities such as a hunt for mountain lions and the expansion of bighorn sheep populations for additional hunting opportunities. The Service would consider allowing for limited, quality-oriented hunting opportunities of furbearers or mountain lion provided the populations are stable. For mountain lion, there would likely be a special drawing and only a few licenses would be issued.

It is also important to engage young people in wildlife-dependent recreation and engender enthusiasm and support for hunting, wildlife conservation, and the Refuge System to build a conservation ethic. Early season or preseason hunts are best suited for youth since they provide the best harvest opportunities. These programs would spark interest in hunting and hopefully lead to recruitment of more young refuge supporters.

There is also a demand for hunting opportunities that are accessible to hunters with special needs, such as hunters with mobility impairments. Currently, there is one accessible blind on the west end of the refuge and the USACE has an accessible campground downstream of the dam.

The refuge is isolated and many hunters feel that camping is necessary to ensure a quality hunt. Under this and the other alternatives camping would be continue to be permitted, however, efforts would be made to minimize any habitat and wildlife disturbances that result from camping.

Strategies for Hunting D1–D6

Same as B, except:

- No planting of domestic crops to lure big game.
- Continue to restrict all camping to within 100 yards of a numbered route.

PUBLIC USE—FISHING

Fishing is permitted on the refuge. Anglers often catch catfish, walleye, northern pike, sauger, perch, small mouth bass, bullhead, paddlefish, and lake trout. The USACE is responsible for providing recreation on their primary lands and waters. The Service works cooperatively with USACE to manage the lands, waters and public recreation opportunities within the Fort Peck Lake Project and the refuge boundary. The Service will continue to cooperate with the USACE and the State to ensure that a quality-fishing program exists within the refuge.

Objectives for Fishing, Alternative A

Fishing A1. Over 15 years, continue to follow State fishing regulations.

(Same as Fishing B1, C1, and D1.)

Fishing A2. Over 15 years, continue to cooperate with MFWP to regulate paddlefish fishing.

Rationale for Fishing A1–A2. Fishing within the refuge has centered on three basic types of opportunity: the fishery within the Fort Peck Reservoir and some opportunities associated with game fish stocked reservoirs scattered throughout the upland portion of the refuge. Fisheries resources have been primarily managed by MFWP (refer to chapter 4, section 4.5) and the refuge has participated in a partnering capacity when opportunities have occurred. There is

a combination of interest in both introduced species of game fish as well as a native fish component that provides for a well rounded set of opportunities for the angler. In particular, native fisheries management associated with the free flowing Missouri River has seen increasing emphasis in management in recent years, by both MFWP and the Service. This management focus will continue into the future and will provide for an increased diversity of opportunities for anglers to gain understanding of the importance of native fisheries while taking part in angling activities.

In this alternative, fishing activities are primarily focused on continuing existing strategies and coordinating future fisheries management with MFWP.

In 2006, about 60,100 fishing visits were recorded out of 233,000 visits to the refuge. Fisherman spent more than 2 million dollars in expenditures, making it third highest ranking wildlife-dependent recreational use of the refuge (Carver and Caudill 2007). Fishing contributes to the local economies through the rental of hotel rooms, eating at restaurants, buying of supplies and fuel.

Paddlefish fishing is very popular with anglers across Montana. In Montana, the Slippery Ann area is one of a few important paddlefish fishing areas along the Missouri River. Historically paddlefish fishing was open to all, and hundreds of anglers would pack into accessible areas from Kipp Recreation Area to Rock Creek boat ramp along the Missouri River. Law enforcement officers remained busy keeping order and preventing resource damage from camping and bank fishing. In recent times, MFWP has placed limits on paddlefish fishing (MFWP 2009c).

Another popular activity, ice fishing is currently permitted on the Missouri River and Fort Peck Lake.

Strategies for Fishing A1–A2

- Work with USACE on maintaining and extending critical boat ramps as the lake recedes due to prolonged periods of drought.
- Follow State regulations for establishment of permanent and portable ice fishing houses.
- Continue to enforce no shoreline driving.

Objectives for Fishing, Alternative B

Fishing B1. Same as Fishing A1, C1, and D1.

Fishing B2. Within 5 years, monitor the effects of fishing on the surrounding resources. Cooperate and collaborate with MFWP to ensure that paddlefish fishing remains a compatible use.

(Same as Fishing C2 and D2.)

Fishing B3. Over 15 years, work with MFWP, USACE and other partners to maintain current access for fishing of sport fish in the Missouri River and Fort Peck Reservoir.

(Same as Fishing C3 and D3.)



Paddlefish

Brett Billings/USFWS

Fishing B4. Within 5 years, evaluate and establish an additional youth fishing opportunity or event at one additional area within the refuge as part of Montana's free fishing weekend.

(Same as Fishing C4 and D4.)

Fishing B5. Within 2–4 years have a mechanism and/or agreement in place to ensure that Refuge System permit requirements are added or incorporated with USACE and/or State-issued permits.

(Same as Fishing C5 and D5.)

Rationale for Fishing B1–B5. As with alternative A, the Service would continue to cooperate and work with MFWP, USACE, and the counties in providing access for anglers. However, under alternative B the Service would closer with MFWP to develop additional strategies to ensure that paddlefish fishing, in particular, remains a sustainable and compatible use. The popularity of paddlefishing has resulted in some shoreline areas becoming heavily impacted from users who come to camp and fish. In the past, it has been considered for protection under the Endangered Species Act, but currently is not a listed species (MFWP 2009b).

The opportunity to expand and develop a closer partnership with MFWP and others would benefit the refuges' goal to introduce youth to the Refuge System.

The refuge has provided little to no oversight of the commercial harvest of fish in the past since most fish management falls under the primary jurisdiction of the USACE and the MFWP. However, Federal regulations governing the Refuge System state that “fishery resources of commercial importance on wildlife refuge areas may be taken under permit in accordance with Federal and State law and regulations” (50 Code of Federal Regulations, Part 31.13). Other regulations govern all commercial uses on refuges. The USACE and State currently manage commercial fishing within the refuge boundary. The Service recognizes these agencies has having primary jurisdiction for management of these activities and will work cooperatively when requested.

Fishing tournaments are popular on the Fort Peck Lake and on thus within the refuge. Care must also be taken to safeguard sensitive habitats or fish and wildlife areas within the refuge. Since fishing tournaments are a use of the refuge, they are subject to regulations governing uses on national wildlife refuges. The refuge has not provided any oversight to tournaments in the past, deferring to the State, and at USACE's regulatory and permitting processes. The Service recognizes these agencies has having primary jurisdiction for management of these activities and will work in a cooperative nature to ensure that public fishing opportunities are not impacted by these activities.

Strategies for Fishing B2 (paddlefish)

- Work with MFWP to determine an acceptable number of permitted paddlefish fishing permits, dates, and harvest strategies to limit conflicts with anglers, wildlife habitat, and other refuge visitors.

- Work with MFWP and build on the research and data collection (creel surveys) already being conducted.
- Work with MFWP to identify critical spawning areas.

Strategies for Fishing B3 (sport fishing)

- If needed, improve access to the lake and river.
- Within 5 years, establish clear access points for ice fishing to minimize effects on upland habitat from vehicles.
- Work with USACE on maintaining and extending critical boat ramps as the lake recedes due to prolonged periods of drought.
- Follow State regulations for establishment of permanent and portable ice fishing houses.
- Seek out partnerships to develop accessible facilities such as piers or platforms that accommodate anglers with disabilities.
- Work with the State to maintain healthy fish populations.
- Work with counties to maintain existing gravel roads to the lake for fishing purposes.
- Identify roads that provide direct access to the lake including all-terrain vehicle access.
- Continue to enforce no shoreline driving.

Strategies for Fishing B4 (young anglers)

- Work with MFWP and USACE to sponsor a fishing event for young anglers in the Fort Peck area that is associated with fishing education program at the Fort Peck interpretive center.

Strategies for Fishing B5 (commercial fishing)

- Recognize the State and USACE as having primary responsibility for managing commercial fishing within Fort Peck Lake and work with these agencies to ensure the fisheries resources of the lake are not impacted.
- Work with MFWP to establish a method of sharing permittee and catch information for the refuge.

Objectives for Fishing, Alternative C

Fishing C1. Same as Fishing B1 and D1.

Fishing C2–C5. Same as Fishing B2–B5 and D2–D5.

Rationale for Fishing C1–C5. Alternative would be similar to alternative B, except that the Service would work with partners on ways to increase fishing opportunities for economic benefit for the community (providing they are found compatible).

Strategies for Fishing C2 (paddlefish)

Same as B and D, plus:

- Evaluate commercial egg harvesting opportunities.

Strategies for Fishing C3 (sport fishing)

Same as B and D, plus:

- Work with MFWP and USACE to evaluate brood ponds to determine if they could provide youth and/or accessible fishing opportunities.
- Explore opportunities for creating additional motorized access areas for ice fishing during winter months (Elk Hole or the Big Swirl) by providing access from the south side of river or Timber Creek. Access from the river or shoreline would not be allowed.
- Seek partnerships or alternative funding for establishment of additional fishing access points.

Strategies for Fishing C4 (young anglers) (*Same as B and D*)

Objectives for Fishing, Alternative D

Fishing D1. Same as Fishing B1 and C1.

Fishing D2–D5. Same as Fishing B2–B5 and C2–C5.

Rationale and strategies for Fishing D1–D5

Same as B, plus:

- Explore opportunities for creating additional motorized access areas for ice fishing during winter months (Elk Hole or the Big Swirl) by providing access from the south side of river or Timber Creek. Access from the river or shoreline would not be allowed.

PUBLIC USE–WILDLIFE OBSERVATION, PHOTOGRAPHY, and INTERPRETATION

The refuge provides a number of facilities for participating in wildlife viewing, photography, and learning about and appreciating the refuge's resources. These include the auto tour route, signs, kiosks, nearly 670 miles of road, the Fort Peck Interpretive Center that the Service cooperates with USACE for operation, and contact stations at Sand Creek and Jordan field stations.

Interpretation consists of self-guided trails, interpretive panels, and brochures as well as staff-dependent exhibits, tours and special events. Interpretation plays a key role in a visitor's experience and environmental awareness and helps foster an appreciation, support, and understanding of the refuge-specific topics and the Refuge System as a whole.

Freeman Tilden (1957) stated, "Any interpretation that does not somehow relate what is being displayed or described to something within the personality or experience of the visitor will be sterile." Similarly, the Service's Visitor Services Handbook (FWS 2009h) suggests focusing the interpretive message on "resource issues that are of the highest importance to the Service, the Refuge System, and the refuge, and are of greatest interest to visitors." The refuge offers excellent opportunities to interpret the wildlife resource, paleontological discoveries, the Refuge System, western settlement history and the

large intact landscape of the Missouri River Breaks in meaningful ways for visitors. To achieve this end, additional interpretive programs and facilities are needed to orient and educate visitors and elicit "revelation upon information" (Tilden 1957).

Self-guided interpretive opportunities allow visitors to learn independently. Interpretive tools for these self-guided opportunities will include exhibits, programs, trails, brochures, website, and signage.

Each of these wildlife-dependent recreational activities requires different programming elements. Because these are nonconsumptive activities (not hunting or fishing), and they are often closely interrelated (for example, a visitor may observe and photograph wildlife while participating in an interpretive program), the objectives have been combined for all. The strategies have been broken out by specific type of program, such as wildlife observation, self-guided activities, and guided activities.

Objectives for Wildlife Observation, Photography, and Interpretation, Alternative A

Observation, Photography, and Interpretation A1. Over 15 years, maintain existing wildlife observation and interpretive facilities and programs to support approximately 40,000 visits who participate in these activities.

Rationale for Observation, Photography, and Interpretation A1. Nonconsumptive uses such as photography, observation, and interpretation are estimated to account for over 40,000 visits to the refuge (Carver and Caudill 2007). Facilities that support these activities include the Fort Peck Visitor Center, contact stations at Sand Creek and Jordan, interpretive displays, auto routes, overlooks and observation platforms, and informational kiosks.

Visitors drawn to the refuge for nonconsumptive activities have found birding and wildlife observation to be the most important activities, which are facilitated with the auto tour route, and walking interpretive trails. During the fall when the elk are in rut, the Slippery Ann Elk Viewing Area enables visitors to see hundreds of elk, and during peak times, on average as many as 175 vehicles have been counted entering the viewing area. In September 2008, traffic counters on the auto tour route counted approximately 390 vehicles or a vehicle every 2.3 minutes from 6:00 a.m. to 8 p.m. (refer to Chapter 4–Affected Environment). Visitors also tend to observe and photograph wildlife collaterally at the same time they participate in other wildlife-dependent activities (hunting and fishing). The auto tour route gives visitors excellent opportunities to view birds and other wildlife.

Under alternative A, the refuge would maintain the same level of services for these activities.

Strategy for Observation, Photography, and Interpretation A1

- Maintain or upgrade existing facilities, signs, website, brochures, exhibits, and other programs.

Objectives for Wildlife Observation, Photography, and Interpretation, Alternative B

Observation, Photography, and Interpretation B1. By year 5, develop and complete a visitor service plan for the refuge. The plan would identify specific programming elements in addition to identifying interpretive themes, messages, and audiences for wildlife observation, photography, and interpretation to support objectives B4 and B5 (refer to table 3 in section 3.13 below about step-down plans).

(Same as Observation, Photography, and Interpretation C1 and D1.)

Observation, Photography, and Interpretation B2. Within 5 years and as part of objective B1 above, conduct a visitor experience survey to obtain an accurate estimate of visitors and their desired needs and experiences for wildlife observation.

Observation, Photography, and Interpretation B3. By year 5, hire an outdoor recreation planner for the refuge (refer to objectives for refuge operations).

Observation, Photography, and Interpretation B4. Over 15 years, increase participation in wildlife observation, photography, and interpretive activities use by 5–10 percent annually (approximately 2,000–4,000 visits).

Observation, Photography, and Interpretation B5. Over 15 years, improve the quality of and/or increase the number of observation, photography, and self-guided and staff-dependent interpretive programs or facilities by approximately 5–10 percent (from alternative A). This would be based on the visitor services plan and could include observation blinds or facilities, trails, sign, science center at the Sand Creek Field Station, or other programs.

Rationale for Observation, Photography, and Interpretation B1–B5. The refuge provides a beautiful and remote setting for wildlife observation and photography. While the extensive road system provides access to areas that are rich with wildlife and are picturesque, many observation areas are not promoted nor signed. With the exception of the elk-viewing areas, visitors may have difficulty locating overlooks and other areas that lend themselves to photography and observation. The large number of vehicles using the elk-viewing area in the fall raises concerns about overcrowding.

Successful implementation of the habitat management improvements identified under uplands, river bottoms, riparian areas, and shorelines would

provide for a greater diversity of wildlife available for observation, photography, and other interpretive programs. Initially most of the refuge's resources will be spent at improving habitat conditions on the refuge, and as a result it would likely take 15 years to fully develop and implement a program that would result in modest increases in visitation.

Simultaneously, the refuge would seek to close 106 miles of existing road and increase proposed wilderness units (refer to Access and Wilderness for specifics). The visitor services plan would identify where modest improvements could be made (for example, building a lek blind) to attract visitors seeking wildlife observation or birding opportunities. A critical component in accomplishing the objectives and strategies is having an outdoor recreation planner on staff as currently, there is not a person dedicated to the overall recreation, interpretive, and education program. Additionally, a visitor survey would enable the refuge to have a better estimate of the number of visitors coming to the refuge to participate in nonconsumptive activities and identify the issues and needs for future facilities such as parking areas and observation areas.

Constructing additional facilities for wildlife watching such as blinds, trails, or designating another road on the refuge would draw in visitors who are seeking that opportunity. It will be important that new and expanded wildlife observation and photography facilities complement the natural settings within the refuge.

Strategies for Observation, Photography, and Interpretation B1–B5 (wildlife observation and photography)

- Maintain existing wildlife-viewing area.
- Recruit volunteers for the Christmas bird count and other birding-related events.
- Identify observation areas to the public through signage and maps.
- Develop website-based observation materials such as bird lists and information, maps, and web cams.
- At Fort Peck Interpretive Center, provide a computer kiosk where visitors can access birding information (for example, songs, using Thayer birding software).
- Incorporate the refuge as a stop on the Montana birding trail and regional birding drives. Provide support materials at the refuge, headquarters, and online to guide visitors through the State and direct them to key birding spots.
- Construct one to three additional facilities (blinds, trails, or tour routes) to support wildlife observation (accessibility standards would be followed). (Refer to objectives and strategies for Refuge Operations.)

Strategies for Observation, Photography, and Interpretation B1–B5 (interpretation)

- Maintain the Fort Peck Interpretive Center exhibits.
- Identify gaps in interpretation materials or programs and additional themes to expand on through improved programming
- Develop additional interpretive exhibits and materials.
- Update the existing refuge wildlife and bird lists.
- Continue to print and distribute the refuge's general brochure.
- Update the refuge history brochure.
- Improve visitor contact areas at the Sand Creek, Fort Peck, and Jordan field stations by providing more interesting and informative information.
- Routinely update the website and incorporate changing interpretive content into the design.
- Increase elk-viewing bus tours to include other communities.
- Work with Phillips County to use their buses for interpretive activities and bus tours.
- Incorporate a stewardship message into interpretive facilities and programs to instill in visitors greater support for the refuge and its resources.
- Continue to place interpretive signs at public access and overlook points (for example, Crooked Creek) in cooperation with various agencies and units of government.
- Inventory, maintain, and replace signs, as needed.
- Maintain the auto-tour route.
- Inventory all facilities, and determine audiences for outreach efforts and update inventory annually.
- Design two, short, accessible, hiking trails with interpretive signage and brochures for visitors of all needs at Fort Peck and Sand Creek field stations.
- Continue to cosponsor special events related to wildlife and habitat conservation.
- Actively publicize and participate in one national event such as National Wildlife Refuge Week and Migratory Bird Day.

Objectives for Wildlife Observation, Photography, and Interpretation, Alternative C

Observation, Photography, and Interpretation C1. Same as Observation, Photography, and Interpretation B1 and D1.

Observation, Photography, and Interpretation C2. Same as Observation, Photography, and Interpretation B2 and D2.

Observation, Photography, and Interpretation C3. By year 5, hire two outdoor recreation planners for the refuge (refer to objectives for refuge operations).

Observation, Photography, and Interpretation C4. Over 15 years, increase participation in wildlife observation, photography, and interpretive activities use by about 20–50 percent on the refuge (approximately 8,000–20,000 more visitors annually).

Observation, Photography, and Interpretation C5. Over 15 years, improve the quality of and/or increase the number of observation, photography, and self-guided and staff-dependent interpretive programs or facilities by approximately 5–15 percent (from alternative A). This would be based on the visitor services plan and could include observation blinds or facilities, trails, sign, an interpretive center at Sand Creek Field Station, or other programs and facilities.

Rationale for Observation, Photography, and Interpretation C1–C5. MFWP states that nature-related tourism and recreation are growing trends nationally, regionally, and within the State of Montana (MFWP 2009d). Wildlife viewing is in the top two reasons for travel to the State in all “travel countries” within the State. Although Yellowstone and Glacier National Parks and other areas along the Rocky Mountain Front account for the greatest expenditures for travel and tourism, the demand for wildlife viewing is expected to increase nationally and in the Rocky Mountain west, and demand will almost be double that of supply (MFWP 2009d).

With these trends, the Service believes under alternative C it would be realistic to significantly increase participation in nonconsumptive activities over 15 years. For example, bird watching is growing faster than any other form of outdoor recreation, and providing facilities like viewing blinds that enhance viewing experiences represent an investment in that economy as well as in creating a conservation constituency (Colorado Division of Wildlife 2007). To increase the numbers by about 20–50 percent, (up to 20,000 more visits), the refuge would need to invest in additional viewing facilities and programs (for example, blinds or improving access). An interpretive center at Sand Creek Field Station, developed in partnership with others, could draw more visitors to the refuge. The Service would also need to increase the awareness of the refuge as a place to visit. Additionally, the Service would improve access into several areas (for example, potentially gravel Knox Ridge Road and establish a trail on the eastern edge of the refuge (Sand Arroyo). Reducing the acreage of proposed wilderness units could also create additional access opportunities.

Similar to alternative B, within 5 years a visitor experience survey would be initiated and a visitor

services plan would be written to take a more comprehensive look at the overall program and facilities needs. Two outdoor recreation planners would be hired (Lewistown and Fort Peck field stations), and these positions would be critical to achieving these objectives.

Strategies for Observation, Photography, and Interpretation C1–C5 (wildlife observation and photography)

Same as B, plus:

- Host bird identification events in conjunction with International Migratory Bird Day in May and other special events.
- Explore new areas to promote for their wildlife observation and photography opportunities.
- Where feasible, develop a simple map within each visitor center where visitors can record what they saw and where (for example, a laminated refuge map that people can write on with a dry-erase marker).
- Construct two to five accessible facilities (blinds, trails, or tour routes) including a lek blind (refer to objectives and strategies for Refuge Operations).
- Design and map bird-watching trails for public use. Work with partners in establishing an 8-mile Sand Arroyo trail along the eastern boundary of the refuge in cooperation with BLM and others (4 miles would be on Service land—see figure 9).

Strategies for Observation, Photography, and Interpretation C1–C5 (interpretation)

Same as B, plus:

- Develop a tour map with geological and biological information for each segment.
- Develop a portable tabletop exhibit.
- Enhance/update/improve Fort Peck Interpretive Center exhibits.
- Explore closed captioning visual/audio in providing accessible exhibits.
- Develop materials such as exhibits and pamphlets, as well as educational programs that explain the region's conservation priorities and the refuge's resources.
- Improve visitor contact areas at the Sand Creek, Fort Peck, and Jordan field stations, make brochures always available.
- Update the website and incorporate changing interpretive content into the design.
- Initiate grouse-viewing programs and provide blinds for public use.
- Expand elk-viewing opportunities in other locations.
- Develop, sign, and map an additional interpreted auto tour route.

- Complete exhibits and natural plant landscaping at refuge headquarters in Lewistown and at each of the three field stations. Ways to do this include:
 - Establish office native plant gardens with interpretive information.
 - Add interpretive information to all office artifacts and mounts.
 - Coordinate with Fort Peck Interpretive Center on natural landscaping and interpretive programs at the center.
- Actively publicize and participate in three events such as National Wildlife Refuge Week or Migratory Bird Day.

Objectives for Wildlife Observation, Photography, and Interpretation, Alternative D

Observation, Photography, and Interpretation D1. Same as Observation, Photography, and Interpretation B1 and C1.

Observation, Photography, and Interpretation D2. Same as Observation, Photography, and Interpretation B2 and C2.

Observation, Photography, and Interpretation D3. Same as Observation, Photography, and Interpretation C3.

Observation, Photography, and Interpretation D4. Over 15 years, increase participation in wildlife observation, photography, and interpretive activities use by about 15–25 percent on the refuge (approximately 6,000–10,000 more visits annually).

Observation, Photography, and Interpretation D5. Over 15 years, improve the quality of and/or increase the number of observation, photography, and self-guided and staff-dependent interpretive programs or facilities by approximately 10 percent (from alternative A). This would be based on the visitor services plan and could include observation blinds or facilities, trails, signs, science and interpretive center at Sand Creek Field Station, or other programs and facilities.

Rationale for Observation, Photography, and Interpretation D1–D5. Similar to B, habitat improvements to uplands, river bottoms, riparian areas, and shorelines could increase opportunities for viewing and photographing wildlife. The Service would seek to increase by a moderate amount the number of visitors participating in these activities, subsequently adding programs or facilities (for example, observation blinds and/or science and interpretive center at Sand Creek Field Station) as needed, but would provide for quality-based experiences. Although quality is difficult to define precisely, and it means something different for every visitor, developing an experienced-based approach that provides for the diverse interests of visitors, while operating within

the capabilities of the resources (Manfredo 2002), would achieve this goal. Experience-based management proposes that recreation opportunities be described in terms of the experience, setting, and the activity. Some visitors have a great experience if they observe a lot of wildlife, regardless of how many other people are around. For others, a quality experience could mean seeing less wildlife but being around fewer people (Manfredo 2002).

Increasing visitation by 15 percent would require a moderate investment in facilities and programs. As with alternative C, a critical component for implementation is the development of the visitor services plan, completing a visitor experience survey, and the addition of two outdoor recreation planners to carry out and oversee the program.

Strategies for Observation, Photography, and Interpretation D1–D5

Same as B, plus:

- Explore new areas to promote for their wildlife observation and photography opportunities, such as expansion of elk-viewing opportunities.
- Where possible, establish universally accessible observation blinds.
- Initiate grouse-viewing programs and provide accessible blinds that allow visitors to view grouse on leks after peak hen attendance has

occurred. Peak attendance of male grouse occurs towards the end of the breeding season and this allows visitors to have quality viewing experiences while minimizing disturbances to actual breeding activity.

- Develop a bird guide map to target birder audiences and provide more sophisticated quality interpretive opportunities.
- Develop at least one additional (three total), accessible nonmotorized trails system for families and people with disabilities.
- Develop 2–5 miles of primitive hiking trails including one on east side at Sand Arroyo (see figure 10).
- Consider the State section north of Slippery Ann for facilities.

PUBLIC USE–ENVIRONMENTAL EDUCATION

The purpose of environmental education is to advance public awareness, understanding, appreciation, and knowledge of key fish, wildlife, plant, and resource issues through formal, curriculum-based programs tied to national and State education standards. Environmental education may be geared toward children or adults, and it is key for changing attitudes and



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Refuge staff member conducting an interpretive field trip on the refuge.

behavior, which affect the refuge through off-refuge land use decisions and on-refuge conduct and use. Only through understanding and appreciation will people be moved to personal and collective action to ensure a healthy refuge for the future.

Objectives for Environmental Education, Alternative A

Education A1. Over 15 years, maintain limited educational programs.

Rationale for Environmental Education A1. Most of the schools in the six counties surrounding the refuge are located far from the refuge making field trips difficult due to time constraints and budgets. The refuge staff provides classroom presentations when requested but there is not an outdoor recreation planner on staff or refuge-specific curricula. Fort Peck and Jordan field station staffs have participated with other agencies in annual environmental camps. There is an education trunk available for loan to the school through the Fort Peck Interpretive Center.

Strategy for Environmental Education A1

- Continue to offer the educational bus tour, school visits and staffing the fair booth.

Objectives for Environmental Education, Alternative B

Education B1. Within 5–7 years, expand the quantity of the environmental education programs (on and off refuge) offered by the refuge by about 5 percent (program elements will be identified in the overall visitor services plan for all public uses—refer to table 3 in section 3.13 below about step-down plans).

Rationale for Environmental Education B1. The Service is committed to connecting people with nature through initiatives such as “Children in Nature” (FWS 2009b). Books like *Last Child in the Woods* (Louv 2005) have highlighted the importance of connecting children with nature. Louv contends that the lack of nature in the lives of today’s wired generation (Louv refers to it as nature-deficit) contributes to disturbing childhood trends, such as rises in obesity, attention disorders, and depression.

Similar to the objectives for wildlife observation above, the first action under alternative B is to develop the visitor services plan that identify the elements of an environmental education program at the refuge and hire an outdoor recreation planner. Given that very limited environmental education programming exists, with additional staff, there would be a moderate increase in the quantity of environmental education programs. The programs will focus on wildlife biology and habitat requirements and will modify existing curricula to highlight refuge issues. Since environmental education is curriculum-based and labor intensive, initial efforts will

be limited to Fort Peck and Lewistown field stations when an outdoor recreation planner is hired.

Strategies for Environmental Education B1

- Develop environmental education program as part of the visitor service’s step-down plan.
- Identify gaps in environmental education materials/programs and additional themes to expand on through improved programming and/or conducting a visitor experience survey.
- Promote teacher taught and refuge taught programming that incorporates the “Children in Nature” initiative in both structured and unstructured ways. Encourage family visits and family awareness of the refuge and the refuge system. Promote programs to get all ages of children outdoors (for example, “Lets go Outside” initiative).
- Respond to request for technical assistance for curriculum-based environmental education (for example, Range Days, Bio-Blitz, Envirothon, Field Days).
- Use refuge website to promote environmental education. Include downloadable podcast.
- Offer two teacher workshops on a yearly basis to all interested school districts in central and eastern Montana promoting refuge-based (local community) and regional-based information.
- Within 5–7 years, provide refuge-taught environmental education programming at no less than two school visits per year.
- Over 15 years, work with partners to modify existing environmental education curricula tailored to the refuge (for example, BLM, USACE, State, Project Wild, Project Wet, Nature Learning, and Project Learning Tree.) Potential topics include prairie streams, prairie plants and wildlife, and invasive plants.
- Align teacher and refuge taught school programs with State and local educational standards.

Objectives for Environmental Education, Alternative C

Education C1. Within 5–10 years, expand the quantity of the environmental education programs (on and off refuge) offered by the refuge by about 25 percent (program elements will be identified in the overall visitor services plan for all public uses—refer to table 3 in section 3.13 below about step-down plans).

Rationale for Environmental Education C1. Similar to B, except because public use is emphasized under this alternative, the refuge environmental education program would be substantially expanded and would focus on threatened and endangered species, reintroduced species, and restoration activities. Existing curricula would be modified to highlight these issues

and several new curricula will be developed in compliance with State standards.

Because it would be more labor intensive, additional staff would be needed (two identified—refer to objectives for wildlife observation, photography, and interpretation).

Strategies for Environmental Education C1

Same as B, except:

- Offer five teacher workshops annually to school districts in central and eastern Montana promoting refuge-based (local community) and regional-based information.
- Within 5–7 years, provide refuge-taught environmental education programming at no less than five school visits per year.
- Over 15 years, work with partners to create up to three environmental education curricula, unique to the refuge and modify existing environmental education curricula tailored to the refuge. Potential topics include prairie streams, use of fire, prairie plants and wildlife, invasive plants, paleontological resources, and threatened and endangered species.
- Request that researchers working at the refuge share information they collected through presentations at schools.
- Hire two outdoor recreation planners (as part of public use program). (Same as D.)
- Seek out partnerships with the Office of Public Instruction to encourage expansion of environmental education programs among local schools.
- Build on existing relationships with schools for both on-site and off-site programming.
- Refuge staff or volunteers will present at Job/Education days at local high schools.

Objectives for Environmental Education, Alternative D

Education D1. Within 5–10 years, expand the quantity of the environmental education programs (on and off refuge) offered by the refuge by about 10 percent (program elements will be identified in the overall visitor services plan for all public uses—refer to table 3 in section 3.13 below about step-down plans).

Rationale for Environmental Education D1. Similar to B, except there would be a moderate increase in the environmental education program, with an emphasis on quality. The programs would primarily focus on the Service’s conservation goals as well as biological diversity, biological integrity and the ecological processes that shape the refuge, but other topics including ranching history would be included. Existing curricula will be modified to highlight these issues and at least one new curriculum will be developed in compliance with State standards.

Strategies for Environmental Education D1

Same as B, plus:

- Offer two to four teacher workshops on a yearly basis to all interested school districts in central and eastern Montana promoting refuge-based (local community) and regional-based information.
- Over 15 years, work with partners to create up to two environmental education curricula, unique to the refuge. Potential topics include prairie streams, use of fire, prairie plants and wildlife, invasive plants, and ecology of the Missouri River Breaks with emphasis on sentinel plants.
- Hire two outdoor recreation planners (as part of public use program). (Same as C.)

PUBLIC USE–OUTREACH

Outreach efforts help educate people about the refuge and its needs. It involves communication between the refuge and interested groups and the public such as local communities and city, county, State, and Federal officials. Outreach may include formal meetings or informal discussions with visitors or landowners, as well as news releases, organized programs, tours, and presentations. It is an “on-going, concerted effort that establishes mutual understanding, promotes involvement, and influences attitudes and actions, with the goal of improving joint stewardship of our natural resources” (FWS 2009h).

Objectives for Outreach, Alternative A

Outreach A1. Over 15 years, current outreach activities at current levels.

(Same as Outreach B1.)

Rationale for Outreach A1. Currently outreach activities include public presentations, news releases, weed tours, county commissioner meetings, and meetings with nongovernmental organizations to talk about refuge programs and activities.

Strategies for Outreach A1

- Occasionally participate in State and local events such as State, county, and school career fairs.
- Make presentations as requested.
- Recruit volunteers to support staff.
- Seek grants in partnership with others to fund special events or programs.
- Use the Internet to keep public informed about refuge’s programs and activities.

Objectives for Outreach, Alternative B

Outreach B1. Same as Outreach A1.

Outreach B2. By year 10, build greater awareness and appreciation for the Service and refuge’s resources. As a result there would be a 5-percent increase in requests for information, visitation, and website hits.

Outreach B3. By year 5, engage outside audiences (such as interested groups, the public, or visitors) in at least two meetings, presentations and/or open houses per year.

Rationale for Outreach B1–B3. The refuge would increase its outreach efforts whether through active participation in local events and meetings or by developing a friends group (a nongovernmental organization that specifically works on behalf of furthering the refuge or Refuge System’s goals). The outreach message would be focused on the refuge’s goal of increasing wildlife resources. Increased efforts toward outreach should result in modest increases in results for information about the refuge from current levels.

For example, improving the quality and content of the refuge’s website would be one way for the refuge to reach out to a larger audience. Recent data suggests that “hits” (visits to the website <http://fws.gov/cmr>) are seasonal and likely due to a visitor’s particular interest, for example, hunting or development of the refuge’s CCP. Prior to hunting season, hits to the website increase from all over the United States as well as residents in Montana.

Strategies for Outreach B1–B3

Same as A, plus:

- Actively participate in one State and local events such as State, county, and school career fairs.
- Investigate developing a friends group for the refuge within 2 years of the CCP approval.
- Improve the refuge’s website by adding at least two of the following activities:
 - Add photographs of the refuge.
 - Add video of elk rut, prairie dog towns, and sage-grouse and sharp-tailed grouse leks.
 - Expand web cams on the refuge.
 - Incorporate blogs on the refuge-specific information on a prairie dog town or the elk-viewing area. Include downloadable podcast.
 - Include travel conditions for roads on the website.
 - Add downloadable version of all refuge brochures to the website.
- Conduct two information-sharing events (such as interviews, public service announcements, an writing articles) with the media (newspaper, television, and radio), chambers of commerce, congressional contacts, and tourism outlets per year.
- Develop an outreach plan as part of the visitor services plan (refer to table 3 in section 3.13 below about step-down plans).
- Work with the Montana tourism department to promote the refuges and their resources.

Objectives for Outreach, Alternative C

Outreach C1. By year 10, build greater awareness and appreciation for the Service and refuge’s resources. As a result there would be a 15-percent increase in requests for information, visitation and website hits.

Outreach C2. By year 5, engage outside audiences such as interested groups, the public, and potential visitors in at least five meetings, presentations and/or open houses per year.

Rationale for Outreach C1–C2. Similar to B, except there would be a greater emphasis on outreach for both communicating wildlife and habitat goals as well as for increasing visitation to the refuge.

Strategies for Outreach C1–C2

Same as B, plus:

- Develop a friends group immediately on completion of CCP and a second volunteer group focused on advocating on behalf of the refuge.
- Use the Internet to complete four to six of the following activities:
 - Add photos of refuge.
 - Expand web cams on the refuge. For example, add video of elk rut, prairie dog towns, and sage-grouse and sharp-tailed grouse leks.
 - Incorporate blogs on the refuge-specific information on a prairie dog town or the elk-viewing area.
 - Include travel conditions for roads on the website.
 - Add downloadable version of all refuge brochures to the website.
- Annually conduct five information-sharing events, such as interviews and writing articles, with the media (newspaper, TV, and radio), chambers of commerce, congressional contacts, and tourism outlets.

Objectives for Outreach, Alternative D

Outreach D1. By year 2, build greater awareness and appreciation for the Service and refuge’s resources. As a result there would be a 5–10 percent increase in requests for information, visitation and website hits.

Outreach D2. By year 5, engage outside audiences such as interested groups, the public, and potential visitors in at least three meetings, presentations and/or open houses per year.

Rationale for Outreach D1–D2. Similar to C, except outreach would focus on the refuge’s goal of restoring ecological processes. There would be less emphasis on maximizing the number of visits and more emphasis on the quality of the public use programs.

Strategies for Outreach D1–D2

Same as B, plus:

- Conduct three information-sharing events (such as interviews, public service announcements, an writing articles) with the media (newspaper, television, and radio), chambers of commerce, congressional contacts, and tourism outlets per year.

PUBLIC USE–ACCESS

There are nearly 670 miles of road found on the refuge. Hard-surfaced, all-weather roads are limited to U.S. Highway 191 on the western end of the refuge and several highways around Fort Peck. A number of graveled roads provide direct access to the refuge. All other roads are passable only in dry weather. All-terrain vehicles (ATVs) and motorcycles must be street-legal. Properly licensed snowmobiles are allowed only on the frozen surface of Fort Peck Reservoir. Bicycles may be used only on numbered roads, including seasonally closed roads.

Boating is permitted on the refuge although special regulations apply on the western edge, which is part of the National Wild and Scenic River System. Aircraft may not land on the uplands of the refuge. Landing of fixed-wing aircraft is permitted at specific locations on Fort Peck Reservoir (refer to Chapter 4–Affected Environment).

Objectives for Access, Alternative A

Access A1. Over 15 years, keep about 670 miles of roads and trails open (see figure 7). Maintain to existing standards.

Access A2. Within 3–5 years, work with partners to develop comprehensive travel management plan. (Same as Access B2, C2, and D2.)

Access A3. Over 15 years, allow for public access as currently designated by refuge regulations.

Rationale for Access A1–A3. To limit erosion and protect plants and wildlife, mechanized vehicles are permitted only on numbered refuge roads that are designated as open. Some seasonal road closures could occur, but generally access would remain as it currently exists.

Under all alternatives including alternative A, the Service would develop a comprehensive travel plan, which would also dove-tail with the visitor services plan for alternatives B, C, and D.

Strategies for Access A1–A3

- Institute seasonal closures on a limited basis. Continue to permit horseback riding; all-terrain vehicle use on public roads; biking on numbered roads (including seasonally closed roads).
- Permit public planes to land only on water or ice as determined by USACE's plan.

- Roads within proposed wilderness units would remain closed.

Objectives for Access, Alternative B

Access B1. Within 3–5 years, analyze all forms of access to determine what effect access has on wildlife populations, habitat conditions and cultural resources.

Access B2. Same as Access A2, C2, and D2.

Access B3. Over 15 years, work with counties to re-configure the refuge road system, closing about 106 miles of roads or sections of roads that no longer provide a public benefit or do not facilitate the achievement of habitat objectives.

Access B4. By year 5, identify safety hazards and partners to routinely maintain the refuge road system. (Same as Access C4 and D4.)

Rationale for Access B1–B4. With more than 670 miles of road crisscrossing the refuge, there are few places that cannot be accessed within a mile of a road (refer to Chapter 4–Affected Environment). The majority of the roads are primitive and not heavily traveled except during hunting season; nonetheless, the number and extent of the road system is cause for concern from a wildlife management, law enforcement, and road maintenance perspective.

Some refuge roads have become severely rutted and braided, particularly during wet seasons, and there is little funding to maintain or patrol all the roads. Roads and invasive plants go hand in hand on most public lands in the United States (USFS 2003), as roads are a known vector for carrying weed seeds. The full extent of the problem is unknown at the refuge because invasive species mapping has not been done for all upland areas, but invasive weeds are of considerable concern in many areas (for example, north fork of Rock Creek and Big Dry Arm (see figure 20 in chapter 4). The Service has worked with refuge users, particularly during hunting season, to reduce the transport of invasive species by vehicles by running the weed wash station.

Roads also can result in wildlife disturbance and habitat fragmentation. Habitat fragmentation has been shown to exacerbate the problem of habitat loss for grassland birds. While understanding the effects of habitat fragmentation is complex and not easy to assess, it is critically important to do so in making decisions about grassland management (Johnson 2001).

With the emphasis on increasing wildlife populations under alternative B, the Service would look to close about 106 miles of road (see figure 8). This would increase the size of undisturbed habitat blocks on the refuge and could benefit wildlife as a whole. It also could reduce the spread of invasive plants carried in by vehicles. Closures would not occur before

fully analyzing harvest strategies in cooperation with MFWP or other public access concerns. Access to private land would not be affected by any road closures. The following roads (by road number) would be closed based on the criteria listed (some roads meet multiple criteria and will appear more than once below):

- For protection of wilderness values: 306, 311, 315, 318, 327 (east end), 410, 411, 412, 420, 452, and 838
- To increase blocks of undisturbed habitat or reduce wildlife impacts: 219, 308, 309, 311, 315, 320, 327, 329, 332, 333, 335, 353, 359, 366 (east end), 366 (includes 621 and 622), 374, 401, 405, 410, 411, 412, 416, 417, 428, 440, 441, 442, 476, 479, 542, 543, 548, 602, 825, 838, and 864
- For protection of riparian areas: 308, 405, and 420
- To address safety or maintenance issues: 219, 302, and 513
- Where there is no defined legal public access: 215, 353, 355, 359, 365, 476, 479, 488, 489, 547, 548, 609, 616, 617, and 618
- Where the area is easily accessible from off the refuge or from another road: 309, 320, 355, 416, 420, 440, 441, 513, 548, 616, and 618

Strategies for Access B1–B4

- Direct funds and staff to evaluate all forms of access (including motor boat) and its effects on various wildlife populations.
- Use this information to make final recommendations for closing access (roads) seasonally or permanently or restricting boat motors to reduce disturbance to wildlife.
- Within 2–5 years, assess the use of mountain bikes within all numbered routes, seasonally closed roads, and closed roads.
- Study effects of recreation in proposed wilderness and wilderness on the refuge along with closed, seasonally closed and numbered roads to evaluate current restrictions and its wildlife and habitat effects.
- Work with private landowners, counties, USACE, BLM, and MFWP to identify roads that provide legal public access on/off the refuge. Acquire legal access where needed and feasible.
- Eliminate all roads that provide exclusive access to the refuge because of inaccessible private lands within or outside the refuge.
- By the year 2014, produce a GIS road layer and public use “Guide Map” that shows legal public access to/on the refuge, designates all weather roads and dirt “two tracks” and roads that end at waters edge, and shows fences and gates to accommodate horse users.

- Consider opening or closing numbered routes seasonally or permanently.
- Consider restricting all access during some times of the year and allowing it at other times such as seasonal closures.
- Work with partners to improve the elk-viewing area and reduce congestion by enlarging the area.
- Evaluate the demand for multimodal accessibility.
- Determine the extent of road use and the types of use.
- Reduce road stems.
- Maintain directional signage and improve way-finding system as needed.
- Develop road management systems to compete for national funds.
- Perform “hot spot” road safety audits (for example, problem areas include Knox Ridge and Sandy Creek Road).
- Perform an audit of 100–200 roads by year 3.

Objectives for Access, Alternative C

Access C1. Within 3 years, evaluate all access points and possible new access points and determine methods for increasing access to the refuge.

Access C2. Same as Access A2, B2, and D2.

Access C3. Over 15 years, work with partners to improve the road system to improve access (see figure 9).

Access C4. Same as Access B4 and D4.

Rationale for Access C1–C4. A number of options would be explored to improve public access. There would be few additional road closures (see figure 9), although seasonal closures could still be needed for wildlife protection. Generally, the Service would work with the counties and other partners to improve the road system (for example, additional road maintenance on some roads, or by graveling). Some existing roads would be evaluated to determine if road improvements could be made without significantly affecting wildlife (such as Knox Ridge and Turkey Joe roads). Many users have expressed the desire for increased access during the winter months to popular ice fishing areas like Swirl, Elk Creek, and Timber Ridge, and these areas would be evaluated for safety and other factors. The Service would also look at whether the elk-viewing area could be expanded or use spread out to other areas to reduce congestion and improve the visitor experience during the fall viewing season.

Strategies for Access C1–C4

Same as B, plus:

- Improving access will include diverting refuge funds and staff to purchase rights of ways for

graveling all-weather roads, creating additional parking for disabled persons, developing trail-heads, vehicle-parking areas, camping sites, and providing equestrian facilities.

- When it is determined that a form of access has no negative affect on wildlife populations, access could be increased or improved.
- Within 5 years, evaluate all roads that end at waters edge to determine if it is feasible to construct boat ramps for water access.
- Increase access to lake/river for fishing and other uses by identifying roads that lead to the waters edge.
- Increase opportunities to access wilderness by creating parking lots adjacent to proposed wilderness units.
- Work with counties and others to upgrade additional all weather roads to and on the refuge (for example, Knox Ridge and Turkey Joe).
- Evaluate the opportunity for motorized vehicles on lake/river during winter season (for example, ATVs and snowmobiles) and consider providing seasonal access to desirable winter fishing holes including Swirl, Elk Hole, and Timber Creek.
- Institute seasonal use of the roads where appropriate.
- Improve roads adjacent to proposed wilderness units to enhance wilderness recreation and value (for example, Soda Creek, Beauchamp, and Harpers Ridge).
- Work with partners to improve the elk-viewing area and create additional pull-offs and/or viewing areas along the road system to facilitate wildlife observation.
- Evaluate the demand for multimodal accessibility.
- Within 10 years, designate and post closed roads within the refuge and wilderness study areas as hiking trails open to the public. Delineate on the current refuge map the location of these closed roads for guidance and accessibility.
- Determine the extent of road use and the types of use.
- Maintain directional signage and improve way-finding system as needed.

Objectives for Access, Alternative D

Access D1. Within 3 years, evaluate access points and determine improvements that can be made to enhance ecological processes on the refuge.

Access D2. Same as Access A2, B2, and C2.

Access D3. Over 15 years, work with counties to re-configure the refuge road system, initially closing about 23 miles of roads or sections of roads as needed

to encourage free movement of animals, permit prescribed fire activities, harvest wild ungulates, provide for quality wildlife-dependent recreation, or allow other activities that contribute to overall improved ecological health. (See figure 10 in section 3.7 above.)

Access D4. Same as Access B4 and C4.

Rationale for Access D1–D4. Alternative D strikes a balance between providing for the improved access that some refuge users desire, managing big game populations to improve habitat, and meeting MFWP harvest objectives while ensuring that the access plan enables the Service to restore ecological processes. To achieve the overall habitat and public use objectives, other road closures could be needed, but this would be assessed in consideration of harvest strategies and other public uses and would be identified during development of the transportation plan. There would be moderate increases in providing for nonconsumptive uses, and improved access and facilities could be important in facilitating these activities. The Service would consider allowing motorized access on some closed roads (outside of wilderness areas) for game retrieval only. If conditions warrant, other improvements or closures would be considered.

The following roads (by road number) would be closed based on the criteria listed (some roads meet multiple criteria and will appear more than once below):

- For protection of wilderness values: 306, 311, and 315
- To increase blocks of undisturbed habitat or reduce wildlife impacts: 320
- To address safety or maintenance issues: 374 (portion of) and 825
- Where there is no defined legal public access: 353, 355, 365, 476, 479, 488, 489, 609, 616, 617, and 618
- Where the area is easily accessible from off the refuge or from another road: 320, 616, and 618

Strategies for Access D1–D4

Same as B, plus:

- Consider funding and personnel requirements for opening and closing roads (including seasonally closed roads), or additional access points, or changes in access.
- Increase access to roads to meet habitat objectives, such as for game retrieval.
- Consider ways to improve opportunities for visitors to participate in nonconsumptive uses, such as by providing viewing areas.
- Consider improving Knox Ridge Road for all-weather access (gravel).

- Work with other agencies/partners to restrict access or expand roadless areas if needed to facilitate ecological processes.
- Institute seasonal closures at beaches to protect nesting endangered species.
- Decrease access to roads to minimize invasive species (for example, north fork of Rock Creek and Big Dry Arm).
- Replace structures that are barriers to aquatic organisms (for example, fish-friendly culverts).
- Restrict access to proposed wilderness units to meet biological objectives.

PUBLIC USE—RECREATION SITES

There are two primary types of recreation areas found on the refuge: (1) developed areas that have amenities such as campsites, running water, and boat ramps and are managed by USACE or outgranted to MFWP or BLM; and (2) primitive areas that only have vault toilets and are managed by the Service. Additionally, there are a few additional primitive areas with no facilities that were outgranted to the Service in the Enhancement Act (refer to chapter 1, section 1.9). The following objectives address areas that the Service manages.

Objectives for Recreation Sites, Alternative A

Recreation Sites A1. Over 15 years, work cooperatively with USACE to further define and/or improve existing Service recreation areas.

Rationale for Recreation Sites A1. The 1992 Fort Peck Lake Master Plan identified 18 recreation areas around the lake. These are mostly managed by the USACE with a few outgranted to MFWP, BLM, Petroleum County and the Service. Seven of these 18 (Downstream campground, Fort Peck West, The Pines, James Kipp, Crooked Creek, Hell Creek, and Rock Creek on the Big Dry Arm) have been classified as intensive use. Intensive use means these areas may have concession operations, resort, and quasi-public development (camping loops, picnic tables and shelters, play areas and landscaping). Other intensive use areas are less developed. The remaining areas are defined as low intensity. Development in low intensity areas is limited to facilities that promote or allow public use but do not greatly alter the natural character of the area. Facilities permitted include trails, parking areas, boat ramps, vault toilets, picnic tables, and fire rings.

Camping areas that the Service manages are Slippery Ann, Rock Creek, Turkey Joe, Withrow Bottoms, Jones Island, and Rocky Point. Where opportunities arise, the Service would work with USACE to further define these areas to prevent the campsites from spreading into adjacent habitat.

These are primitive areas with a vault toilet where the public camps while hunting or fishing. In addition, there are the primitive Bear Creek and Bob Cat areas that have no facilities.

Strategies for Recreation Sites A1 (None)

Objectives for Recreation Sites, Alternative B

Recreation Sites B1. Within 5 years, work with the USACE to further define and/or improve existing Service recreation areas.

(Similar to Recreation sites C1 and D1.)

Rationale for Recreation Sites B1. Current Service-managed recreation areas are primitive (vault toilet) compared to the USACE or other agency managed recreation areas around the refuge. More visitors are using these areas for hunting, fishing, and elk viewing. These areas provide a site for visitors to gather and enjoy the Breaks while participating in wildlife-dependent recreational activities. Without these designated areas, the natural resources would be affected largely due to visitors being dispersed across a wider area.

Strategies for Recreation Sites B1

- Harden all sites to define current recreation area boundary to prevent future expansion into habitat.
- Work with USACE to evaluate the site potential for improving camping within the designated USACE recreation areas.
- Coordinate accessible and usable camping sites that would suit the required needs of those requiring special accommodations.
- Evaluate current recreational facilities and restrictions for user friendliness and ecological effects.

Objectives for Recreation Sites, Alternative C

Recreation Sites C1. Similar to Recreation Sites B1 and D1.

Rationale for Recreation Sites C1. Same as B, except more improvements would be made to improve the experience.

Strategies for Recreation Sites C1

Same as B, plus:

- Consider the possibility of expanding into already disturbed land around the existing recreational area and improve existing recreation facilities, for example, additional restrooms and handicap-accessible landings, to improve the experience.

Objectives for Recreation Sites, Alternative D

Recreation Sites D1. Similar to Recreation Sites B1 and C1.

Rationale for Recreation Sites D1. Same as B, except there would be more improvements made under alternative D than B but fewer than under alternative C.

Strategies for Recreation Sites D1

Same as B, plus:

- Consider improving existing facilities to improve the overall refuge experience.

PUBLIC USE—COMMERCIAL RECREATION

Commercial uses are any economic use of a national wildlife refuge. Other commercial uses are cooperative farming, haying, timber harvest, commercial fishing, and grazing. Outfitting is another example of a commercial use. All commercial uses must be appropriate and compatible with the mission of the Service and the Refuge System and the purpose for the refuge was established. Commercial uses that are not appropriate and compatible are not allowed and if they are occurring, they must be eliminated or modified to be compatible.

Objectives for Commercial Recreation, Alternative A

Commercial Recreation A1. Over 15 years, limit the annual number of outfitter hunting permits to 11.

Rationale for Commercial Recreation A1. Commercial guiding and outfitting services have been and would continue on the refuge under a special use permit. These activities primarily are associated with hunting. Currently fishing outfitting, fishing tournaments, and commercial fishing are not covered by special use permit. All commercial activities on the refuge require a permit as identified by Title 50, Code of Federal Regulations (50 CFR).

Strategy for Commercial Recreation A1

- Continue to prohibit commercial outfitting for coyote hunting.

Objectives for Commercial Recreation, Alternative B

Commercial Recreation B1. Within 5 years, in collaboration with MFWP and USACE, implement a consistent process for issuing permits for persons conducting for-hire outfitter hunting and wildlife observation activities.

(Same as Commercial Recreation D1.)

Rationale for Commercial Recreation B1. Same as A, plus commercial fishing including tournaments are a popular activity on Fort Peck Lake where USACE has primary jurisdiction. The refuge has little to no oversight of commercial fishing harvest, deferring to the State's expertise and experience as well as USACE's primary jurisdiction.

The Service would look to work with MFWP and USACE to better understand the fishery resources and the levels of harvest. The refuge participated in the development of the Fort Peck Reservoir Fisheries Management Plan (MFWP 2002) that addressed fishing tournaments and commercial fishing. MFWP is in the process of rewriting the 10-year plan and the refuge would request to be a cooperating agency.

Strategies for Commercial Recreation B1

- Evaluate all commercial uses on the refuge for possible effects on wildlife populations.
- Evaluate current intensity of outfitting to determine if public use is being affected as a result.
- With the above information, make adjustments as necessary to ensure commercial uses are compatible with refuge missions and purposes.
- Evaluate the numbers of animals harvested by commercial outfitters. Require outfitters to project expected harvest levels in permit application each year.
- Determine net-client hunter use days and harvest success rates for each outfitter and outfitter-sponsored client numbers.
- Work with the State, BLM and USACE to develop capacity parameters within the refuge for various types of guiding operations. The parameters should aim to minimize competition or conflict with the public engaged in hunting, fishing, and wildlife observation, minimize conflicts between guides, and ensure a viable economic opportunity for existing guiding businesses.
- Conduct a public information effort through news releases and media contacts to implement the objective.
- Provide proactive enforcement through the refuge's and other agencies' law enforcement officers.

Objectives for Commercial Recreation, Alternative C

Commercial Recreation C1. Same as Commercial Recreation B1.

Commercial Recreation C2. Within 5 years, implement a wilderness guide and retrieval permit to promote harvest of surplus game animals in proposed wilderness units.

Rationale for Commercial Recreation C1–C2. Permits would continue to allow outfitting throughout the refuge and not designate specific areas of use. A new type of outfitting permit would be created to encourage hunters to harvest surplus game animals in the proposed wilderness units. These roadless areas provide security habitat for a variety of wildlife. These outfitting permits would promote harvest of cow elk that would help to reduce local populations. This

would also create a economic opportunity to local outfitters and provide for a quality recreational experience for hunters that choose to hunt with a guide.

Strategies for Commercial Recreation C1–C2

Same as B, plus:

- Expand commercial outfitting (for example, paleontological prospecting, trail rides, birding, youth-challenge adventures, fishing, and hunting) by issuing more annual permits.
- Extended camping will be authorized when requested to facilitate commercial use.
- Promote commercial outfitting through media outlets on an annual basis.
- Partners with others to promote ecotourism opportunities on the refuge and throughout the Missouri River Breaks.

- Create a new outfitting permit for guiding and/or game retrieval in proposed wilderness units.

Objectives for Commercial Recreation, Alternative D

Commercial Recreation D1. Same as Commercial Recreation B1.

Rationale and Strategies for Commercial Recreation D1

Same as B, except:

- Consider implementing outfitter permit for guiding and retrieval in the proposed wilderness if cow elk numbers continue to increase or are causing impacts on vegetation in the area.

There are 20,819 acres in the UL Bend Wilderness and 155,288 acres of proposed wilderness within 15 units on the Charles M. Russell National Wildlife



Purple Prairieclover

OBJECTIVES for GOAL Wilderness

Refuge. Service policy requires a review of proposed wilderness including making recommendations on whether additional acreage could be added or other changes should be made (refer to Appendix E–Wilderness Review and Summary). The alternatives consider different approaches for managing the proposed wilderness within the refuge.

Objectives for Wilderness, Alternative A

Wilderness A1. Over 15 years, continue to manage the 20,819-acre UL Bend Wilderness as a class I air shed. (Same as Wilderness B1, C1, and D1.)

Wilderness A2. Within 2 years, finalize the wilderness study and submit recommendations to the Service Directorate and Secretary for the Department of the Interior.

(Same as Wilderness B2, C2, and D2.)

Wilderness A3. Over 15 years, continue to manage about 155,288 acres of proposed wilderness within 15 areas of Charles M. Russell National Wildlife Refuge in accordance with Service policy.

Wilderness A4. Continue the practice of allowing the use of game carts in proposed wilderness units.

(Same as Wilderness B4, C4, and D4.)

Rationale for Wilderness A1–A4. The UL Bend Wilderness (Public Law 94-557) and the proposed wilderness units are managed according to the Wilderness Act of 1964. The act requires wilderness be managed in a natural condition, with opportunities for solitude and a primitive and unconfined type of recreation. Visitors to the UL Bend Wilderness and the proposed wilderness units are primarily hunters and hikers seeking big game hunting and wildlife observation opportunities. The Service’s wilderness policy (FWS 2008d) describes how the refuge manager preserves the character and qualities of designated wilderness while managing for the establishing purposes of the refuge. This policy, like the Wilderness Act, states that wilderness is maintained with outstanding opportunities for solitude and a primitive and unconfined type of recreation. The refuge manager conducts minimum requirements analyses before taking any action that may affect wilderness character. In general, the manager would not modify habitat, species population levels, or natural ecological processes in refuge wilderness unless doing so maintains or restores ecological integrity that has been degraded by human influence or is necessary to protect or recover threatened and endangered species.

Strategies for Wilderness A1–A4 (None)

Objectives for Wilderness, Alternative B

Wilderness B1–B2. Same as Wilderness A1–A2, C1–C2, and D1–D2.

Wilderness B3. Over 15 years, and on approval by within the Department of the Interior, expand existing proposed wilderness by about 25,037 acres by expanding the Antelope Creek, Crooked Creek, Alkali Creek, Wagon Coulee, West Hell Creek, and Sheep Creek units.

Wilderness B4. Same as Wilderness A4, C4, and D4.

Rationale for Wilderness B1–B4. Alternative B places the greatest emphasis on increasing or maximizing wildlife populations. One of seven key considerations in evaluating the tangible and intangible aspects of wilderness characteristics as described in the Wilderness Stewardship Policy (FWS 2008d) is providing “environments for native plants and animals” (refer to Appendix E–Wilderness Review and Summary). Maintaining or increasing wilderness along with closing roads could increase security for wildlife, reduce habitat fragmentation, and provide other positive benefits for wildlife. Following the wilderness review conducted for this draft CCP and EIS (appendix E), and in consideration of the wildlife emphasis under alternative B, none of the existing proposed wilderness units were recommended for reduction and in 10 units acreage would be expanded.

Strategies for Wilderness B1–B4

- Continue to allow game retrieval carts in proposed wilderness units.
- Conduct a minimum requirement analysis of all proposed wilderness.
- Inform and educate the public about wilderness on the refuge adopting some or all of interpretive themes identifying for wilderness education in the wilderness stewardship policy.

Objectives for Wilderness, Alternative C

Wilderness C1–C2. Same as Wilderness A1–A2, B1–B2, and D1–D2.

Wilderness C3. Over 15 years and on approval by the Department of the Interior, reduce the existing proposed wilderness units to 119,407 acres by eliminating the units of East Beauchamp Creek, West Beauchamp Creek, and East Hell Creek (a 35,881-acre reduction).



USFWS

Proposed wilderness units on the refuge provide secure habitat for wildlife like these bighorn sheep.

Wilderness C4. Same as Wilderness A4, B4, and D4.

Rationale for Wilderness C1–C4. Alternative C has the greatest emphasis on promoting wildlife-dependent uses and economic uses while protecting wildlife populations and habitat to the extent possible. During the public comment period for scoping and the alternatives (refer to Appendix B—Public Involvement), some refuge users expressed concern that wilderness designation limits the ability of many people, particularly an aging hunting population and other users to access areas of the refuge. Few roads would be proposed for closure under this alternative, and access would be improved in some areas.

Following the wilderness review conducted for this draft CCP and EIS (appendix E), and in consideration of the emphasis on public and economic uses, under alternative C, several of the existing proposed units would be eliminated. In these units, the wilderness qualities and characteristics, as described in the Service’s wilderness policy, are not as high compared to those found in other units. Private lands within the unit, adjacent roads, degraded habitat, adjacent sights, and sounds, and private lands located within the unit are all factors in proposing to remove these units from proposed wilderness designation.

Strategies for Wilderness C1–C4 (*Same as B*)

Objectives for Wilderness, Alternative D

Wilderness D1–D2. Same as Wilderness A1–A2, B1–B2, and C1–C2.

Wilderness D3. Over 15 years, on approval by the Department of the Interior, expand wilderness pro-

tection in 6 units totaling about 18,559 acres in Antelope Creek, Crooked Creek, Alkali Creek, Wagon Coulee, West Hell Creek, and Sheep Creek units, and reduce or eliminate three units totaling 26,744 acres in East Beauchamp Creek, West Beauchamp Creek, and East Hell Creek.

Wilderness D4. Same as Wilderness A4, B4, C4.

Rationale for Wilderness D1–D4. Alternative D has an emphasis toward restoring the biological diversity, integrity, and environmental health of the refuge while providing for quality wildlife-dependent uses. Similar to alternative B, keeping the wilderness designation, in combination with closing some roads will increase security for wildlife, reduce habitat fragmentation, invasive species infestations, and provide other positive wildlife benefits, which are important considerations in restoring ecological processes. Three of the units totaling about 26,744 acres that currently possess fewer quality wilderness characteristics as described in the Service’s wilderness policy would be eliminated. Private lands within the unit, adjacent roads, degraded habitat, adjacent sights and sounds, and private lands located within the unit, and other management considerations are factors in proposing to remove these units from proposed wilderness designation (see figure 10).

Six units totaling 18,559 acres would be expanded because they possess the outstanding wilderness tangible and intangible aspects as described in the Service’s wilderness policy.

Strategies for Wilderness D1–D3 (*Same as B and C*)

OBJECTIVES for GOAL

Cultural and Paleontological Resources

CULTURAL RESOURCES

The refuge contains hundreds of prehistoric and historic resources (more than 50 years old). There are numerous old homestead cabins, cemeteries, and Native American sites. Remnants of old river towns such as Carroll and Rocky Point, which sprung up in the 1820s and 1860s to serve the fur trade and steamboat traffic have been washed away by the mighty Missouri River. Other homestead sites were lost when Fort Peck dam was completed and the lush river bottoms were flooded by the reservoir.

Objectives for Cultural Resources, Alternative A

Cultural Resources A1. Over 15 years, continue to identify and protect cultural resources on the refuge in accordance with Federal laws and policies.

(Same as Cultural Resources B1, C1, and D1.)

Rationale for Cultural Resources A1. Federal laws and policies mandate the identification and protections of cultural resources on Federal lands. Specifically, section 106 of the National Historic Preservation Act requires all Federal agencies to consider effects on cultural resources before any Federal action. (Same as B, C, and D.)

Strategies for Cultural Resources A1

- Identify historic homesteads to maintain.
- Protect all known gravesites and maintain the cultural resource inventory.

Objectives for Cultural Resources, Alternative B

Cultural Resources B1. Same as Cultural Resources A1, C1, and D1.

Cultural Resources B2. By year 5, develop a step-down plan for the preservation and protection of cultural resources on the refuge.

(Same as Cultural Resources C2 and D2.)

Cultural Resources B3. Within 5 years, identify areas with a high or moderate likelihood of having historic properties.

(Same as Cultural Resources C3 and D3.)

Cultural Resources B4. Within 10 years, survey the moderate and high areas for cultural resources to identify most of the historic properties.

(Same as Cultural Resources C4 and D4.)

Cultural Resources B5. Over 15 years, compile a comprehensive cultural resource overview for the ref-

uge. The overview should describe the nature and extent of past cultural resource investigations, the types of resources known at the refuge, and the interpretive context for these resources.

(Same as Cultural Resources C5 and D5.)

Cultural Resources B6. Over 15 years, develop interpretive materials that explain the refuge's cultural resources.

(Same as Cultural Resources C6 and D6.)

Cultural Resources B7. Over 15 years, develop a system for archiving historic items (including documents, photographs, maps and artifacts in accordance with Department of the Interior policies).

(Same as Cultural Resources C7 and D7.)

Cultural Resources B8. Beginning in year 2, locate individuals with knowledge about the general history of the refuge, the location of sites, or alterations to various buildings and structures.

(Same as Cultural Resources C8 and D8.)

Rationale for Cultural Resources B1–B8. Same as A, plus the refuge contains many historical structures, many of which have not yet been properly surveyed. Additionally, the Missouri River Breaks has a rich history of Native American and Euro-American presence. Identifying sensitive cultural areas and resources will allow staff to better consider cultural resources in planning and would establish the priorities for cultural resource surveys. A cultural resource survey is the best tool available to determine the location of cultural resources at the refuge. Using surveys, both historic and prehistoric resources are identified and key information is gathered that helps for evaluation, planning, research, and educational outreach. There is limited knowledge about cultural resources at the refuge because less than 1,000 acres have been professionally surveyed. Although there are 363 known cultural resource sites, many have very limited documentation.

The overview will outline specific threats to the resources and the ability of future studies to address regional research questions. It will also serve as a planning tool to help encourage consideration of cultural resources during project planning.

To increase the public's appreciation and encourage support for the cultural and paleontological resources, staff needs to interpret the resources. Cultural artifacts and historic structures can provide valuable insight into the settlement of the Missouri River Breaks and the development of the refuge through time and provide the public with a link to the past.

Long-term and past employees, in addition to local residents and members of regional historic societies can be a wealth of information concerning the history of the refuge and the location of specific resources.

Strategies for Cultural Resources B1–B8

- Within 10 years, establish photo documentation and GPS mapping for known significant sites.
- Continue cultural resource reviews of undertakings.
- Improve Service’s ability to conduct thorough and timely reviews including more comprehensive consultation.
- Develop a programmatic agreement with Montana State Historic Preservation Office.
- Create a comprehensive list and map of known historic sites.
- Monitor the condition of the resources on a regular basis using a cultural resource professional and, when possible, adverse effects that are compromising their integrity of the resource should be mitigated.
- Provide staff with access to information on historic properties and request updated information on resource condition when they are in the area.
- Create a sensitivity model for cultural resources locations based on previous survey on the refuge and the surrounding areas, consultation with the State Historic Preservation Officer, the Tribal Historic Preservation Office, and other professionals.
- Make the model available to appropriate staff.
- Ground-truth the model when possible.
- Update and refine the model on a regular basis.
- Conduct cultural resource surveys of areas with a moderate to high potential for cultural resources.
- Work with partners such as other agencies, colleges, and universities to conduct surveys and share resources.
- Notify the region 6 archaeologists when unrecorded cultural resources are located
- Identify cooperative opportunities with colleges and universities.
- Secure grants to complete the resources overview.
- Develop a cultural and paleontological resource fact sheet for distribution to refuge visitors.
- Conduct a comprehensive inventory of historic items and an assessment of their condition.
- Determine the informational and artifact value of the items.
- Protect and store the items of value in archiving stable materials under environmentally appropriate conditions.

- Determine the best strategy to make the information/artifacts useful and available.
- Work with current staff and area residents to develop a list of individuals who may have information about the refuge’s history.
- Conduct field trips and/or interviews with people identified as having knowledge of the history at the refuge.

Objectives for Cultural Resources, Alternative C

Cultural Resources C1. Same as Cultural Resources A1, B1, and D1.

Cultural Resources C2–C8. Same as Cultural Resources B2–B8 and D2–D8.

Rationale for Cultural Resources C1–C8. Same as B, except with the emphasis of promoting wildlife-dependent uses, the strategies would reflect an additional emphasis on interpretation and education.

Strategies for Cultural Resources C1–C8

Same as B, plus:

- Create additional cultural resource educational and interpretive materials. (Same as D.)
- Develop brochures and kiosks that interpret cultural resources. (Same as D.)
- Collaborate with organizations such as Earth Watch or the Passport in Time program to encourage professionals to work with volunteers to identify or stabilize resources.
- Use interpretive signs to interpret an area (but not a specific location).

Objectives for Cultural Resources, Alternative D

Cultural Resources D1. Same as Cultural Resources A1, B1, and C1.

Cultural Resources D2–D8. Same as Cultural Resources B2–B8 and C2–C8.

Rationale for Cultural Resources D1–D8. Same as B, plus there would be less emphasis on promoting public uses than under alternative C and more of an emphasis on providing quality experiences, but the objectives would be essentially the same. The strategies would slightly differ from alternative B and would include education and interpretation materials.

Strategies for Cultural Resources D1–D8

Same as B, plus:

- Create additional cultural resource educational and interpretive materials. (Same as C.)
- Develop brochures and kiosks that interpret cultural resources. (Same as C.)

PALEONTOLOGICAL RESOURCES

Many paleontological resources have been excavated from the refuge. Among the most recognizable dinosaur fossils finds to come from the refuge include *Tyrannosaurus rex*, *Triceratops*, *Albertosaurus*, *Mosasaurus*, and hadrosaurs (refer to Chapter 4—Affected Environment). A number of the collections are on display at the Fort Peck Interpretive Center. Collection of any fossils is not permitted without a special use permit.

Objectives for Paleontological Resources, Alternative A

Paleontological Resources A1. Over 15 years, continue to issue permits to the Museum of the Rockies or others for collecting paleontological resources and prohibit recreational digging.

(Same as Paleontological Resources B1, C1, and D1.)

Rationale for Paleontological Resources A1. Currently the Museum of the Rockies in Bozeman, Montana has a permit to dig for fossils on the refuge, and providing they met the terms of the permit, this would continue.

Strategy for Paleontological Resources A1

- Monitor operator to ensure compliance with terms of the permit, and monitor and investigate any reports of illegal digging.

Objectives for Paleontological Resources, Alternative B

Paleontological Resources B1. Same as Paleontological Resources A1, C1, and D1.

Paleontological Resources B2. Within 5 years, in cooperation with the Museum of Rockies and USACE, develop a step-down plan for paleontological resources. Ensure plan specifies guidelines for implementing uniform permitting of paleontological research to credible research facilities across the refuge.

(Same as Paleontological Resources C2 and D2.)

Paleontological Resources B3. Within 5 years, interpret and promote the national natural landmarks on the refuge. At a minimum post the plaque and announce the designation.

(Same as Paleontological Resources C3 and D3.)

Rationale for Paleontological Resources B1–B3. Montana State University is evaluating paleontological resources and working on the step-down plan. The

plan will include guidelines to decide when and how to issue permits for science and education. Montana State University is the official repository for paleontological resource collected from the refuge.

Two areas on the refuge have been designated as national natural landmarks—Bugg Creek and Hell Creek.

Strategies for Paleontological Resources B1–B3

- Increase law enforcement to protect the paleontological areas.
- Educate the staff on paleontological laws and its implication for management and protection of paleontological resources on the refuge.
- Potentially develop additional educational displays in the field offices, Fort Peck Interpretive Center, and the headquarters to interpret the paleontological resources.

Objectives for Paleontological Resources, Alternative C

Paleontological Resources C1. Same as Paleontological Resources A1, B1, and D1.

Paleontological Resources C2–C3. Same as Paleontological Resources B2–B3 and D2–D3.

Rationale for Paleontological Resources C1–C3. Same as B, except the approach would increase opportunities for research when compatible with protection of resources.

Strategies for Paleontological Resources C1–C3

Same as B, plus:

- Consider increasing education opportunities and permits for universities.
- Consider purchase of inholdings for protection.

Objectives for Paleontological Resources, Alternative D

Paleontological Resources D1. Same as Paleontological Resources A1, B1, and C1.

Paleontological Resources D2–D3. Same as Paleontological Resources B2–B3 and C2–C3.

Rationale and Strategies for Paleontological Resources D1–D3

Same as B, except:

- Limit or manage special use permits when necessary to protect resources.

OBJECTIVES for GOAL

Refuge Operations and Partnerships

REFUGE OPERATIONS

Refuge operations include management of facilities, structures, and other land or water use. The refuge relies on personnel, equipment, and facilities to carry out both the day-to-day operations and the long-term programs such as land acquisition. The below objectives describe how the Service uses funding and personnel to meet the refuge complex goals.

Objectives for Refuge Operations, Alternative A

Operations A1. Continue mineral withdrawal on all refuge lands until 2013, and work to renew withdrawal or acquire minerals.

Operations A2. Over 15 years, work within the Service to adjudicate and define water rights.

(Same as Operations B2, C2, and D2.)

Operations A3. Over 15 years, maintain existing public use facilities (refer to Chapter 4—Affected Environment).

(Same as Operations B3, C3, and D3.)

Operations A4. Over 15 years, maintain refuge personnel at current levels as identified in table 6 (section 3.14 below).

Rationale for Refuge Operations A1–A3. Public Land Order 6997 (1993) withdrew minerals for all the refuge until 2013. Under all the alternatives, the Service would continue to renew and seek to purchase minerals on future acquisitions. This would not include

private or State lands where this is exempted. The United States holds Federal reserved water rights on the refuge (refer to Chapter 4—Affected Environment), and the United States is in the process of quantifying these reserved rights with the Montana Reserved Water Rights Compact Commission.

There are approximately 28 full-time equivalent positions and a number of seasonal staff at the refuge (refer to table 6 in section 3.14 below). This includes positions that are funded by general refuge operations funding and fire funding (separate account). While funding and personnel needs can and do change over time; generally, these are personnel levels that would be needed for 15 years.

Strategies for Refuge Operations A1–A4

- Seek to purchase minerals on fee acquisitions.
- Adhere to legal rights-of-way obligations for access to private and State lands including those for oil and gas extractions.
- Maintain select stock ponds.
- Maintain the auto tour route, elk-viewing area, accessible hunting blind and interpretive kiosks.
- Staff the interpretive center at Fort Peck Field Station with refuge personnel.
- Continue to work with the USACE to manage the boat ramps.
- Ensure refuges are signed and that directional signage is in place. Collaborate with the highway department to develop and position signage.



USFWS

A Service employee prepares to release an endangered black-footed ferret on the refuge.

Objectives for Refuge Operations, Alternative B

Operations B1. Same as Operations A1, plus seek permanent withdrawal of all minerals, including oil and gas and other leasable and saleable minerals on all refuge lands and future acquisitions.

(Same as Operations C1 and D1.)

Operations B2–B3. Same as Operations A2–A3, C2–C3, and D2–D3.

Operations B4. Improve facilities as identified under the strategies and as part of implementing the public use objectives identified above.

(Same as Operations C4 and D3.)

Operations B5. Within 5–10 years, add the needed staff including full-time positions, seasonal positions and volunteers to fully carry out the CCP as identified in table 6 (section 3.14 below).

(Same as Operations C5 and D4.)

Rationale for Refuge Operations B1–B5. Same as A, plus specific improvements and additions would be made to public use facilities as part of implementing the objectives for public use and development of the visitor services step-down plan (see specific topic under public use). The exact number of facilities, length of trail, and location would need to be determined based on projected visitor numbers and after more detailed programming occurred with the visitor services plan. There would be a need to increase personnel by about four positions to meet habitat and public use objectives, and one position would be eliminated (trainee).

Strategies for Refuge Operations B1–B5

Same as A, plus:

- Remodel restrooms associated with campgrounds (Slippery Ann) to be made accessible.
- Construct additional facilities (blinds, trails, or tour routes) including a lek blind for sage-grouse and/or sharp-tailed grouse as identified in the visitor services plan.
- Design and map bird-watching trails for public use.
- Fill one outdoor recreation planner position for the Lewistown or Fort Peck field station. If feasible, add a second person.
- Add additional law enforcement personnel for Fort Peck Field Station. (Same as C and D.)
- With an increase in fire funding and through the Refuge Operations Needs System database, continue to work towards increasing permanent and seasonal firefighting personnel by 50 percent. (Same as C and D.)
- Hire a career/conditional position that is knowledgeable in planting crops to start work on the first river bottom on the list.

- Hire staff to complete new monitoring across the refuge. (Same as C and D.)
- Hire seasonal employees for fence removal and professional fence builders for boundary fence construction of remaining fences. (Same as C and D.)

Objectives for Refuge Operations, Alternative C

Operations C1. Same as Operations B1 and D1.

Operations C2. Same as Operations A2, B2, and D2.

Operations C3. Same as Operations A3 and B3.

Operations C4–C5. Same as Operations B4–B5 and D3–D4.

Rationale for Refuge Operations C1–C5. Similar to A and B, except there would be a need to increase personnel by seven to eight positions to meet habitat and public use objectives and one trainee position would be eliminated. (Same as D.)

Strategies for Refuge Operations C1–C4

Same as B, plus:

- Evaluate the possibility of constructing an interpretive center at the Sand Creek Field Station in cooperation with various nongovernmental organizations.
- Develop displays in the field offices and the headquarters to interpret the paleontological resources. (Same as D.)
- Hire two visitor services personnel (outdoor recreation planners) at Lewistown Field Station and Fort Peck Field Station (top priority). (Same as D.)
- Hire staff and graduate students to complete habitat inventories. (Same as D.)
- Hire two maintenance employees for UL Bend refuge. (Similar to D.)

Objectives for Refuge Operations, Alternative D

Operations D1. Same as Operations B1 and C1.

Operations D2. Same as Operations A2, B2, and C2.

Operations D3–D4. Same as Operations B4–B5 and C4–C5.

Rationale for Refuge Operations D1–D4. Same as C, except positions could be classified differently because of the different emphasis.

Strategies for Refuge Operations D1–D4

Same as B, plus:

- Evaluate the possibility of constructing a science and interpretive center at the Sand Creek Field Station in cooperation with various nongovernmental organizations.

- Develop interpretive signage at certain historic properties such as Rocky Point.
- Design and map bird-watching trails for public use.
- Develop displays in the field offices and the headquarters to interpret the paleontological resources. (Same as C.)

PARTNERSHIPS

The refuge and its resources are within a larger landscape that is important to the conservation of the natural and cultural resources at the refuge. Partnerships, including agreements with landowners adjacent to the refuge and other interested agencies and groups, are essential to meeting refuge goals.

Objectives for Partnerships, Alternative A

Partnerships A1 (land management). Over 15 years, work cooperatively with USACE to acquire jurisdiction around the lake to enforce regulations.

(Same as Partnerships B1, C1, and D1.)

Partnerships A2 (land management). Over 15 years, maintain existing partnerships and agreements with Federal, State, county, conservation districts, adjacent private landowners and local communities as identified in section 3.11 below.

(Same as Partnerships B2, C2, and D2.)

Partnerships A3 (land management). Over 15 years, continue working with agencies (USACE, BLM, MFWP, DNRC, counties of Fergus, Petroleum, Garfield, McCone, Phillips, and Valley, and tribal governments), conservation organizations (World Wildlife Fund, American Prairie Foundation, Ranchers Stewardship Alliance, and The Nature Conservancy) and private landowners to manage large free-ranging wildlife (elk, mule deer, pronghorn, and sage-grouse) and species of concern (prairie dogs and black-footed ferrets).

(Same as Partnerships B3, C3, and D3.)

Rationale for Partnerships A1–A3 (land management). Currently the Service works cooperatively with many agencies and jurisdictions and these efforts would continue under all alternatives. There are a number of agreements that are currently in place and these would continue. (Same as B, C, and D.)

Strategies for Partnerships A1–A3 (land management)

(None)

Objectives for Partnerships, Alternative B

Partnerships B1–B3 (land management). Same as Partnerships A1–A3, C1–C3, and D1–D3.

Partnerships B4 (land management). Within 2 years, sign a memorandum of understanding with the above groups that outline habitat conservation strategies

across the landscape for the species mentioned in Partnerships A3.

(Similar to D4.)

Rationale for Partnerships B1–B4 (land management). Many prairie wildlife species require large tracts of undisturbed prairie. Often these species have large home ranges that cover hundreds of square miles and cross multiple land ownership. Several species (for example, prairie dogs and sage-grouse) are in peril due to a combination of factors including loss of habitat, disease and landowner tolerance. Cooperation amongst adjoining landowners and managers to provide all the seasonal habitat needs is necessary for these species to survive. Loss of grassland nesting cover, winter habitat foods, and economic pressures (converting grassland to crops) are a few of the habitat limitations that impact these sentinel species. Conservation incentives from government agencies or conservation groups would help to foster cooperative conservation practices such as supporting level 1 prairie dog town of 5,000 acres, preserving sage-grouse nesting and winter habitat, and promoting heterogeneity of habitats to support the needs of grassland-obligate birds and other species.

Strategies for Partnerships B1–B4 (land management)

- Develop standardized monitoring strategies to measure habitat conditions, wildlife distribution, and wildlife response to management actions to be used across the area.
- Develop standardized monitoring strategies to measure habitat conditions, wildlife distribution, and wildlife response to management actions to be used across the area.
- Support incentives in the current Farm Bill legislation (Cooperative Conservation Partnership Initiative and Conservation Innovation Grants) that are available to private landowners for habitat conservation for these species.
- Form partnerships and/or memoranda of understanding with private landowners, nongovernmental agencies, local tribes, and BLM to manage for sentinel plant and wildlife species across boundaries.
- Coordinate and cooperate on research and monitoring needs and provide resources to implement adaptive management actions on neighboring lands.
- Manage sentinel wildlife such as prairie dogs to support the full suite of wildlife that rely on prairie dogs and/or prairie dog towns.

Partnerships B5 (volunteers and friends). By year 5, develop a volunteer program and friends group aimed at meeting the refuge's biological and public use objectives.

(Same as Partnerships C5 and D6).

Partnerships B6 (volunteers and friends). Over 15 years, maintain and build partnerships with agencies, communities, and organizations to support and grow public use programs on and off the refuge.

(Same as Partnerships C6 and D7).

Rationale for Partnerships B5–B6 (volunteers and friends).

In 2008, about 39,765 volunteers gave 1.5 million hours in support of Service activities, including 3,338 volunteers in region 6 who contributed 131,169 hours (FWS 2009g). People volunteer for a variety of reasons, but they play an important role in helping the Service meet its mission. Friends groups are important allies for the Service, often advocating for a field station by giving information to local community and elected officials. There are more than 200 friends groups across the Service (FWS 2009g). To implement the refuge's habitat and public use objectives, the Service would establish an active volunteer program and friends group to advance the refuge's programs and establish partnerships with the local communities.

Strategies for Partnerships B5–B6 (volunteers and friends)

- Begin to recruit volunteers.
- Advertise the friend's group and volunteer opportunities on the website, in surrounding communities and within refuge visitor facilities.
- Develop partnerships with wildlife groups and organizations such as Yellowstone Valley Audubon Society and others to market available birding and wildlife opportunities at the refuge.
- Create new partnerships, and maintain and expand existing partnerships with hunters to increase awareness of the importance of bird and habitat conservation.
- Create new partnerships, and maintain and expand existing partnerships with conservation groups and the public to increase public awareness of nonconsumptive bird recreation and bird conservation.
- Seek out partners to establish and promote birding drives.
- Work with partners and volunteers to establish mountain bluebird trails.
- Work with partners to develop an outreach plan as part of the visitor services plan.
- Work with the Montana tourism department to promote the refuges and their resources.
- Work with partners to continue to seek grants to fund events and programs.

Objectives for Partnerships, Alternative C

Partnerships C1–C3 (land management). Same as Partnerships A1–A3, B1–B3, and D1–D3.

Partnerships C4 (land management). Similar to alternative B, except the six counties, tribal governments, conservation organizations (World Wildlife Fund, American Prairie Foundation, Ranchers Stewardship Alliance, and The Nature Conservancy) and interested private landowners would develop habitat management treatments that benefit livestock operators and provide adequate habitat for a suite of prairie species that have large home ranges and/or are species of concern.

Rationale for Partnerships C1–C4. Private ranch operations support a variety of wildlife species. Many species of concern such as prairie dogs and pronghorn are found on lands outside of the refuge. Economic incentives to private individuals for conservation measures benefit both wildlife and local communities. By maintaining intact family ranches, wildlife managers reap the benefits of conservation measures on private lands adjacent to the refuge and conservation organizations. By developing management strategies that benefit livestock operations and certain species of wildlife, all parties benefit. Forming formal partnerships with ranchers for wildlife conservation allows the Service to provide funds and resource to meet conservation objectives on a landscape scale.

Strategies for Partnerships C1–C4 (land management)

- Develop management procedures that will benefit livestock operations and select wildlife species.
- Enter into a formal memorandum of understanding with interested partners to manage lands for sentinel plants and natural ecological process such as historical fire occurrence.
- Manage sentinel wildlife such as prairie dogs to support the full suite of wildlife that rely on prairie dogs and/or prairie dog towns.
- Secure outside funding (Cooperative Conservation Partnership Initiative and Conservation Innovation Grants) for long-term monitoring projects to measure progress of increasing the health and relative abundance of sentinel plants.

Partnerships C5–C6 (volunteers and friends). Same as B5–B6 and D6–D7.

Rationale for Partnerships C5–C6 (volunteers and friends)
(Same as B and D)

Strategies for Partnerships C5–C6 (volunteers and friends)
Same as B, plus:

- Over 15 years, develop partnership with photography clubs to provide five nature photography workshops on the refuge.
- Over 15 years, collaborate with other groups to provide three additional web-based cameras or video to local schools.

Objectives for Partnerships, Alternative D

Partnerships D1–D3 (land management). Same as Partnerships A1–A3, B1–B3, and C1–C3.

Partnerships D4 (land management). Similar to Partnerships B4, except with USACE, BLM, MFWP, DNRC, the six counties, tribal governments, conservation organizations (World Wildlife Fund, American Prairie Foundation, Ranchers Stewardship Alliance, and The Nature Conservancy) and interested private landowners to monitor and manage for sentinel plants and heterogeneity of habitats with associated wildlife.

Partnerships D5 (land management). Over 15 years, promote healthy populations of all plants and associated prairie wildlife lands adjoining the refuge's partner focus area.

Rationale for Partnerships D1–D5 (land management). The habitats of the northern glaciated plains evolved with pyric herbivory influences. Hundred years of fire suppression and constant grazing pressure has affected the health and relative presence of numerous plants (sentinel plants) including skunkbush, winterfat, golden currant, and buffaloberry. By improving the health and distribution of these sentinel plants the overall health of various wildlife species will be improved as well. By restoring pyric-herbivory processes and managing for total ungulate populations, the overall health of these plants and habitats will improve and contribute to the overall biological health and ecological integrity. Land management by private landowners and conservation organizations around the refuge affect plant and wildlife distribution on the refuge.

Strategies for Partnerships D1–D5 (land management)

Same as C, plus:

- Implement a pyric-herbivory study and management program on the refuge as a demonstration site for other interested land managers and landowners.

Partnerships D6–D7 (volunteers and friends). Same as Partnerships B5–B6 and C5–C6.

Rationale and Strategies for Partnerships D6–D7 (volunteers and friends)

Same as B, plus:

- Over 15 years, develop partnership with photography clubs to provide two nature photography workshops on the refuge
- Over 15 years, collaborate with other groups to provide one additional web-based camera or video to local schools.

RESEARCH AND SCIENCE

In addition to the research needs described under the habitat, wildlife, and public use objectives, research as part of a partnering effort is described.

Objectives for Research, Alternative A

Research A1. Continue existing research and continue to maintain partnerships with researchers interested in studying refuge resources.

Rationale for Research A1. The Service works with many universities and researchers and this would continue.

Strategies for Research A1 (None)

Objectives for Research, Alternative B

Research B1. Over 15 years, encourage universities and other organizations to conduct annual surveys on the effects of public use, wildfire, prescribed fire, and other management strategies throughout the calendar year.

Research B2. Over 15 years, support research of habitat, wildlife, and public use.

Research B3. Over 15 years, work with MFWP to annually study the movement of big game relative to habitat changes (for example, fire and grazing).

Research B4. By year 5, begin monitoring wintering pronghorn on the refuge to meet the executive order.

Research B5. Over 15 years, work with MFWP to conduct research on habitat suitability for bighorn sheep.

Research B6. By year 1, increase visitor counts to determine the number and types of visitors on the refuge, and by year complete a visitor use study.

Rationale for Research B1–B6. Research would support the emphasis of increasing wildlife populations.

Strategies for Research B1–B6

- Evaluate refuge assets that will be affected by climate change.
- Include questions on visitor use study targeted at quantifying the type and amount of public use occurring in the refuge's wilderness.
- Measuring what the refuge's visitors value and how they measure quality public use experiences.

Objectives for Research, Alternative C

Research C1–C6. Same as Research B1–B6.

Research C7. By year 5, initiate research of new species proposed for hunting (for example, mountain lion).

Rationale for Research C1–C7. Same as B, plus before a mountain lion hunt would be implemented on the refuge, additional research would be needed to determine population numbers, food requirements, and the role these predators have on other wildlife on the refuge. This would be necessary before the full package can be submitted to Washington for approval.

Strategies for Research C1–C7

Same as B, plus:

- By year 5, work with MFWP to initiate research on the biological potential of mule deer herd's age structure within the Missouri River Breaks.

Objectives for Research, Alternative D

Research D1–D6. Same as Research B1–B6 and C1–C6.

Rationale and Strategies for Research D1–D6 (*Same as B and C*)

3.9 Foreseeable Activities

Reasonably foreseeable future activities are actions and activities that are independent of the proposed actions for the refuge, but could result in cumulative effects when they are combined with the effects of the proposed alternatives. They are anticipated to occur regardless of any action or alternative that is selected. The effects of those are described in the cumulative impacts sections for each resource in chapter 5.

Reasonably foreseeable future activities within or near the refuge are represented in figure 5 (map of decision and analysis areas) and fall into the following categories:

- Federal land management
- State wildlife management
- Nongovernmental conservation activities
- Regional demographic and economic change
- Infrastructure development

FEDERAL LAND MANAGEMENT

Federal land management activities include those by USACE, BLM, and the Department of the Interior.

Fort Peck Dam/Fort Peck Lake Master Plan (USACE)

The master plan and environmental assessment of 2008 analyzes proposed expansion and upgrades to facilities at existing recreation areas as well as natural resource management improvements. The environmental assessment did not identify any significant effects resulting from the proposed master plan alternative. It did note that expanded shoreline

development at Fort Peck West could impact potential piping plover nesting areas, although there are no nests there currently. The environmental assessment also identified localized impacts to air quality, noise, and visual quality due to additional development within existing recreation areas (USACE 2008).

Transfer of Cabin Sites (USACE)

In 2004, USACE cooperated with the Service to complete an environmental assessment reviewing implementation of the Enhancement Act (refer to chapter 1) and found no adverse effects (USACE 2004). Following public comments that questioned the decision to deny conveyance of 12 cabin sites in the South Fork rock Creek area, USACE reexamined the issue and agreed to convey all cabin sites. To offset the effects of this decision to the refuge, USACE agreed to out-grant additional Fort Peck Project lands to the Service (USACE 2005). (Refer to chapter 1, section 1.9—Issues Not Addressed for more information.)

Upper Missouri River Breaks National Resource Management Plan (BLM)

BLM issued a record of decision for its approved resource management plan for the Upper Missouri River Breaks National Monument in December 2008. The plan responds to increasing demands for recreation while providing mitigating measures to manage enhance and protect fish and wildlife habitat and habitat for special status species, including greater sage-grouse and black-tailed prairie dog. Vegetation will be managed to achieve a natural range of native plant communities for a wide variety of long-term benefits including aesthetics, wildlife, recreation, and livestock grazing (BLM 2008).

The approved plan provides diverse recreational opportunities, including both motorized and nonmotorized watercraft use on the Missouri River, with seasonal restrictions on motorized use within the designated wild and scenic river portions. BLM will coordinate with the Service on bank side recreation use and management within the refuge boundaries. The plan includes mitigation measures applied to surface disturbing or disruptive activities to protect important wildlife habitat, including greater sage-grouse, black-tailed prairie dog, bald eagle, bighorn sheep, designative sensitive species and big game winter range. Unavoidable effects of the plan alternatives were limited to localized soil erosion and vegetation impacts resulting from ground-disturbing activities (BLM 2008).

Wilderness Study Areas (BLM)

The BLM has several designated Wilderness Study Areas near or adjacent to the refuge. These include Seven Blackfoot, Burnt Lodge, and Antelope Creek wilderness study areas.

Climate Change Initiative (DOI)

In March 2007, the Secretary of the Interior established the Department of the Interior Climate Change Task Force. That Task Force included subcommittees charged with exploring the potential consequences of climate change on Interior lands and resources, and potential options for addressing them. Based on the findings and recommendations of the Task Force, some of the following issues have the potential for cumulative effects on resources in and around the refuge (DOI 2008):

- changes in water quality and availability
- increased flood risk
- outbreaks of pests, invasive species, and diseases
- changes in wildlife habitat and migration patterns
- changes in wildfire frequency and behavior

Refer to the discussion for the climate change objectives in section 3.8 above.

STATE WILDLIFE MANAGEMENT

Several MFWP wildlife management plans are discussed.

Prairie Dog Conservation Plan

In 2002, the Montana Prairie Dog Working Group developed a statewide conservation plan for prairie dogs, recognizing that current population numbers are much smaller than historical numbers due to eradication programs, conversion of native rangelands, sylvatic plague, and recreational shooting (Montana Prairie Dog Working Group 2002b). The overall goal of the conservation plan is to provide for management and long-term viability of prairie dog populations and associated species. The conservation plan recommends several specific management actions to enhance prairie dog populations.

Big Game Management

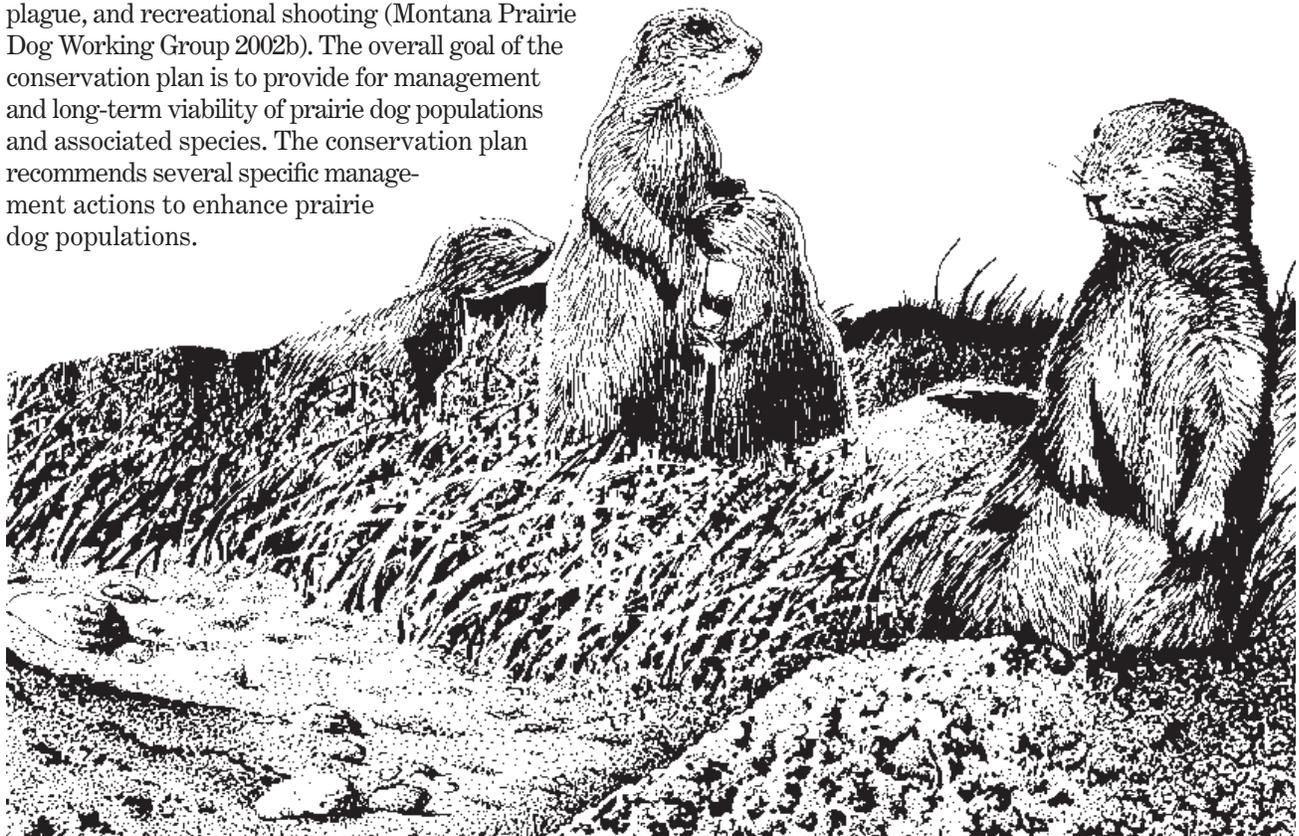
MFWP has completed statewide management plans and conservation strategies for elk (MFWP 2004), mule deer (MFWP 2001), and bighorn sheep (MFWP 2009a). These documents outline guiding principles for management of these species, as well as specific objectives for management units and hunting districts that include the refuge. The elk and bighorn sheep plans outline specific management strategies that include coordination with the Service to achieve herd objectives on and off refuge land.

Fisheries Management

The Fort Peck Reservoir fisheries management plan (MFWP 2002a) includes specific management programs for walleye, sauger, smallmouth bass, lake trout, northern pike, Chinook salmon, forage fish, and fishing tournaments on Fort Peck Reservoir.

Sage-grouse Management

Montana's conservation strategy for sage grouse provides for coordinated management across jurisdictional boundaries and development of community support that will promote successful implementation (MFWP 2005a).



NONGOVERNMENTAL CONSERVATION ACTIVITIES

The American Prairie Foundation, The Nature Conservancy, World Wildlife Fund, National Wildlife Federation, and Ranchers Stewardship Alliance conduct conservation activities on large acreages adjacent to or on the refuge.

American Prairie Reserve

Since 2004, the American Prairie Foundation has been working to create the American Prairie Reserve on private lands adjacent to the north side of the refuge in Phillips County. The mission of American Prairie Foundation is “to create and manage a prairie-based wildlife reserve that, when linked to public lands already devoted to wildlife, it will protect a unique natural habitat, provide lasting economic benefits, and improve public access to and enjoyment of the prairie landscape” (American Prairie Foundation 2008). The foundation has been working on bison restoration, pulling interior fences, conducting stream restoration studies, bison/livestock studies, and other activities. Many stewardship activities are conducted in partnership with the refuge.

The American Prairie Foundation owns or leases 86,962 acres of land. Most of the acreage is public-leased land, while the remainder is deeded private land. The foundation is looking at new properties to expand the prairie reserve through additional leases and acquisitions. Several new properties are under negotiation (Scott Laird, American Prairie Foundation, personal communication on July 23, 2009).

Matador Ranch

The Nature Conservancy manages the 63,000-acre Matador Ranch located north of the refuge near the town of Zortman. The Nature Conservancy purchased the Matador Ranch in 2000 with the intent of conserving native prairie wildlife in the Glaciated Plains of north-central Montana. The ranch is the key element of a grass bank program, whereby grazing land is leased to area ranchers at discounted rates, and in exchange the ranchers agree to conservation measures on their own lands. Management and conservation goals include the protection of habitat for grassland birds, prairie dog colonies, and sage-grouse leks (Barbara Cozzens, Matador Ranch Project Director, The Nature Conservancy; personal communication, October 1, 2009).

Ranchers Stewardship Alliance

“The mission of the Ranchers Stewardship Alliance is to promote the ecological, social and economic conditions that will sustain the biodiversity and integrity of America’s northern mixed-grass prairie for present and future generations. They work to sup-

port cost-effective, sustainable conservation that features private and public cooperation in a working landscape stewarded by profitable family ranches and thriving rural communities” (Ranchers Stewardship Alliance 2008).

LIVESTOCK GRAZING LEASE ACQUISITIONS

In mid-2009, the World Wildlife Fund and the National Wildlife Federation asked ranchers to submit a bid to voluntarily not apply for future grazing privileges on the refuge. In exchange for cash payment, the ranchers would agree to terminate grazing on the refuge and not renew their permits. Several bids were received, and in late 2009, two agreements were finalized retiring grazing on a total of 45,000 acres. This effort is part of the National Wildlife Federation’s Wildlife Conflict Reduction Program, which is intended to reduce grazing conflict with wildlife using marked-based approaches (National Wildlife Federation 2010).

REGIONAL DEMOGRAPHIC and ECONOMIC CHANGE

Demographic and economic trends for the six-county region surrounding the refuge are described in detail as part of the overall socioeconomic context in chapter 4. Some of the reasonably foreseeable trends that could contribute to cumulative effects are briefly described here.

While Montana’s population is expected to increase by 34 percent over the next 20 years, the region surrounding the refuge is expected to continue to lose about 13 percent of its population. While overall employment in the region has been steadily increasing, most of those increases are likely due to people working multiple jobs. Travel and tourism will continue to contribute significantly to Montana’s economy. However, the region surrounding the refuge has experienced a much smaller proportion of growth in travel and tourism spending compared to the rest of the State. As the demand for outdoor recreation has increased, so has the number of land purchases for hunting, fishing, and other recreational uses in areas surrounding the refuge. This trend is expected to continue. With these changes in demographic, economic, and land ownership patterns are also expected to bring changes in local communities, and prevailing attitudes values regarding wildlife, natural resources, and refuge management.

INFRASTRUCTURE DEVELOPMENT

In 2008, TransCanada Keystone Pipeline, LP, filed an application for a Presidential permit for the con-

struction, operation, and maintenance of pipeline facilities at the border of the United States and Canada for the transport of crude oil across the two countries' international boundary. The proposed pipeline project would deliver crude oil from western Canada to locations in the south-central United States. On April 20, 2010, the U.S. Department of State released a draft EIS for the proposed TransCanada Keystone XL Pipeline Project (U.S. Department of State 2010).

The proposed pipeline corridor would be near or adjacent to the northeastern edge of the Charles M. Russell National Wildlife Refuge but would not be located on refuge land. The draft EIS anticipated general effects associated with ground disturbance and construction. The draft EIS analyzed potential effects on federally listed and candidate species including black-footed ferret, greater sage-grouse, least tern, piping plover, and pallid sturgeon. For all of the listed species, the draft EIS determines that the proposed project is not likely to adversely affect the species. With the pipeline route proposed to pass through about 20 miles of core habitat for the greater sage-grouse in Montana, the draft EIS determined that the project would not likely affect the courtship activities of sage-grouse on leks and would likely result in a minor impact on nesting birds (U.S. Department of State 2010).

3.10 Elements Considered but Eliminated from Further Consideration

During scoping and alternatives development, the Service or interested groups and the public suggested a number of goals, alternatives, or elements of alternatives that were considered but eliminated from further analysis. These elements are discussed below.

DEVELOPING GOALS for LIVESTOCK GRAZING and SOCIOECONOMIC USES

Some interested groups and the public requested the Service have a specific goal that would support livestock grazing because Executive Order 7509 made provisions for livestock grazing once the primary purposes were met. As per 50 CFR 29.1, the Service allows for economic uses on national wildlife refuges (including haying, logging, and grazing) when the uses are compatible with refuge purposes and when they contribute to accomplishing the purposes of the refuges or the mission of the Refuge System. It is not the mission of the Refuge System to provide for economic uses.

The Service manages each refuge to fulfill the mission and, where appropriate, restore the lost elements of biological integrity of each refuge and the Refuge System, as well as achieve the specific purposes for which the refuge was established. Congress also provided for six priority wildlife-dependent public uses to be accommodated wherever possible. The Improvement Act only addressed economic uses in the context of how compatibility standards and procedures should be administered for uses of a refuge (Section 6 under the Improvement Act). In reviewing the Service's compatibility policy (FWS 2000a), it states the following:

“Economic uses can only be allowed when they do not materially detract from the fulfillment of the Refuge System mission or the purposes of the refuge. Inherent in fulfilling the System mission is not degrading the ecological integrity of the refuge. Compatibility, therefore, is a threshold issue, and the proponent(s) of any use or combination of uses must demonstrate to the satisfaction of the Refuge Manager that the proposed use(s) pass this threshold test.”

The Service uses livestock grazing to meet specific wildlife and habitat objectives. Grazing was considered in the objectives and strategies in the alternatives, but it was not considered as a specific goal of the planning process.

Like livestock grazing, the Service did not consider socioeconomic issues as being a singular goal of the planning process but did recognize these issues in the formation of alternatives, objectives, and strategies. Specifically, the Service has considered an alternative (C) that would emphasize and promote maximum compatible wildlife-dependent public uses and economic uses while protecting wildlife populations and habitats to the extent possible. The Service did modify language in the Partnership Goal (refer to Chapter 2—Refuge History and Vision) to include more recognition of the social and economic contribution of the refuge to adjacent communities.

ELIMINATING ALL LIVESTOCK GRAZING

Some interested groups and the public requested the Service consider a no-grazing alternative. Although initially considered, it was eliminated from further analysis.

The use of livestock grazing is consistent with the direction provided in the Improvement Act, which defines conservation and management as “to sustain and, where appropriate restore and enhance, healthy populations of fish, wildlife, and plants, utilizing, in accordance with Federal and State laws, methods and procedures associated with modern sci-

entific resource programs.” It is also consistent with the purposes of the refuges.

The northern Great Plains, including much of the landscape in and around the refuge evolved over thousands of years through a complex ecological interaction between fire and grazing (refer to chapter 4). Even if bison (extirpated from the area in the late 1800s) were to be restored to portions of the refuge (a consideration in alternatives B and D if proposed by MFWP), it could take years of coordination and planning to implement. There are many areas within the refuge where fire occurs infrequently or cannot be used because of other factors. Given the complex ecological factors including uncertainties about how climate change could affect wildlife and their habitat, the Service determined that eliminating an important management tool for achieving habitat objectives was not realistic or desired. One alternative (B), considers moving toward prescriptive grazing over most of the refuge in a realistic implementation timeframe. A draft compatibility determination for the use of prescriptive grazing is included in appendix C.

MANAGING ONLY for SHARP-TAILED GROUSE, PRONGHORN, and LIVESTOCK GRAZING

Some interested groups and the public felt the Service should only consider an alternative that only manages for sharp-tailed grouse, pronghorn, and livestock grazing as these were specifically mentioned in Executive Order 7509. Although Executive Order 7509 did single out sharp-tailed grouse and pronghorn for protection in 1936 (in addition to other wildlife), since then there have been a number of executive orders, laws, and policies that have guided the management of the refuge. Not all lands within the refuge were set aside under Executive Order 7509. This includes UL Bend National Wildlife Refuge and other lands acquired through fee title. Many fish, wildlife, and plant species are found on the refuge (refer to Chapter 4—Affected Environment), and although sharp-tailed grouse and pronghorn are named in Executive Order 7509, in only managing for these species, the Service would not meet other refuge purposes, Refuge System mission, or the vision and goals of this planning process.

As stated in chapter 2, the refuge is administered under the provisions of the National Wildlife Refuge Administration Act of 1966 and not Taylor Grazing Act. Several court cases have affirmed this. Under the Refuge System, livestock grazing is used as a management tool for meeting habitat and wildlife objectives, and the four alternatives presented provide for a range of approaches for managing habitat and wildlife.

DEVELOPING a MEMORANDUM of UNDERSTANDING for LIVESTOCK GRAZING

Some interested groups and the public suggested that the Service collaborate with the adjoining conservation districts, either through a memorandum of understanding or through separate contracts for assessment and management of the refuge’s grazing allotments. This would include the calculation of AUMs that each habitat unit could support.

Partnerships certainly play an important role in helping the Service to achieve its planning goals for habitat management. The Service is committed to working with many Federal, State, and local governments, tribal governments, private landowners, and other organizations (refer to the partnership objectives for each alternative in section 3.8 above, as well as 3.11 below). However, a memorandum of understanding or contract with a local government agency to assess and manage grazing allotments as proposed would effectively limit a refuge manager’s ability to make stipulations or decisions on the compatibility of economic activities in managing habitat for the benefit of wildlife (refer to the above discussion on compatibility about developing goals for livestock grazing and socioeconomic uses). In the Improvement Act, Congress set provisions for “ensuring timely and effective cooperation with Federal agencies and State fish and wildlife agencies during the course of acquiring and managing refuges.” Congress did not specify a role for other governmental agencies in managing a refuge’s habitat, which seems to be the intent of this suggestion. The Service has considered an alternative that emphasizes public use and economic use while protecting habitat and wildlife; therefore, this suggestion was not analyzed further.

OPENING ROADS in WILDERNESS

A number of interested groups and the public wanted the Service to consider reopening roads that were previously closed through proposed or designated wilderness, either seasonally or permanently. In compliance with the Wilderness Act and Service’s Wilderness Stewardship policy (FWS 2008d), the Service did not consider reopening formerly closed roads in existing proposed wilderness units. The Service does use the CCP process to determine if other lands should be recommended for wilderness designation or if other changes should be made to the existing proposed wilderness units.

3.11 Partnerships

Many opportunities exist near the Charles M. Russell National Wildlife Refuge to continue existing partnerships or establish new ones. These include the following:

- Federal agencies including BLM, USDA, USGS, USACE, National Oceanic Atmospheric Administration, Federal Highways Administration, and many others.
- MFWP and DNRC on wildlife and habitat management and other State agencies.
- Conservation districts, county commissioners, fire wardens, weed districts and fire districts, and sheriffs departments.
- Nongovernmental organizations including Rocky Mountain Elk Foundation, World Wildlife Fund, American Prairie Foundation, The Conservation Fund, The Nature Conservancy, Montana Wildlife Federation, Wildlife Conservation Society, Yellowstone Valley Audubon Society, Ranchers Stewardship Alliance, Defenders of Wildlife, National Wildlife Federation, grazing associations, the Wilderness Society, Prairie Wildlife Research, and Stockgrowers Association.
- Adjacent private landowners and local communities.

3.12 Monitoring and Evaluation

Adaptive management is a flexible approach to long-term management of biotic resources. Adaptive management is directed, over time, by the results of ongoing monitoring activities and other information. More specifically, adaptive management is a process by which projects are carried out within a framework of scientifically driven experiments to test the predictions and assumptions outline within a CCP (see figure 11).

To apply adaptive management, specific survey, inventory, and monitoring protocols would be adopted for the refuge. The habitat management strategies would be systematically evaluated to determine management effects on wildlife populations. This information would be used to refine approaches and determine how effectively the objectives are being accomplished. Evaluations would include participation by Service personnel and other partners. If monitoring and evaluation indicate undesirable effects for target and nontarget species or communities, alteration to the management projects would be made. Subsequently, the CCP would be revised.

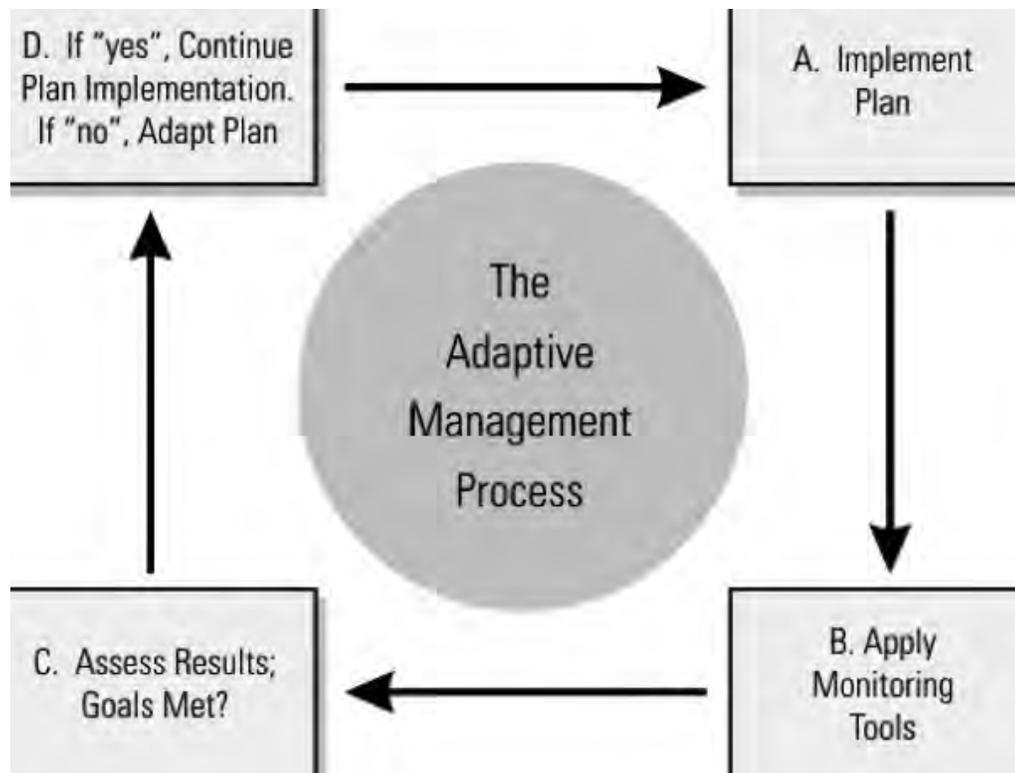


Figure 11. Adaptive management process.

3.13 Plan Amendment and Revision

The final CCP will be reviewed annually to determine the need for revision. A revision would occur if and when significant information becomes available, such as a change in ecological conditions. Revisions to the CCP and subsequent step-down management plans would be subject to public review and compliance with the National Environmental Policy Act. At a minimum, this plan would be evaluated every 5 years and revised after 15 years. Table 3 identifies the step-down plans needed to fully implement the CCP.

Table 3. Step-down management plans for the Charles M. Russell and UL Bend refuges.

<i>Plan</i>	<i>Year to be Completed*</i>
Cultural resources	2017
Fire management	2014
Habitat management	2015–9
Invasive plant management	2015
Paleontological resources	2017
Public use	2017
hunting and fishing	
fishing and mussels	
wildlife observation, photography, and interpretation	
environmental education	
Transportation	2017
Wilderness management	2015

*Depends on the preferred alternative selected for the CCP.

3.14 Funding and Personnel

Refuge budgets generally include ongoing operations funds for personnel, maintenance, and utility needs. Table 4 summarizes the estimated costs for the alternatives over 15 years, and table 5 displays the details used to develop the costs.

Table 6 compares the current personnel plan with the proposed personnel needed under each alternative. Projects required to carry out the final CCP will be funded through two separate systems, as follows: (1) the refuge operations needs system is used to document requests to Congress for funding and personnel needed to carry out projects above the existing base budget; and (2) the Service asset maintenance management system is used to document the equipment, buildings, and other existing properties that require repair or replacement.



Silver Buffaloberry

Table 4. Costs over 15 years to carry out the CCP alternatives for the Charles M. Russell and UL Bend refuges (\$1,000).

	<i>Alternative A</i>	<i>Alternative B</i>	<i>Alternative C</i>	<i>Alternative D</i>
One-time cost	7,945	19,569	18,872	20,356
Salaries	41,310	45,193	56,288	56,351
Total cost	49,255	64,762	75,160	76,707

Table 5. Cost analysis for the CCP alternatives for the Charles M. Russell and UL Bend refuges (\$1,000).

<i>Management Cost Item</i>	<i>Cost Over 15 Years (in thousands of dollars)</i>			
	<i>Alternative A</i>	<i>Alternative B</i>	<i>Alternative C</i>	<i>Alternative D</i>
HABITAT: uplands	317	500	626	598
river bottoms	420	494	350	490
riparian areas and wetlands	150	213	71	258
shoreline	0	51	51	51
CLIMATE CHANGE	45	95	95	95
INVASIVE SPECIES	75	120	120	120
FIRE: prescribed fire	576	2,100	655	2,100
wildfire	1,190	1,190	1,190	1,190
WILDLIFE MANAGEMENT: big game	425	500	435	475
furbearers	100	400	200	400
threatened and endangered species	150	215	215	215
bison	0	80	10	80
other wildlife	0	97	97	97
birds	35	121	96	121
PUBLIC USE: hunting	30	265	338	330
fishing	50	163	189	163
observation, interpretation, photography	95	279	423	346
environmental education	15	35	122	47
outreach	5	15	25	20
commercial uses and outfitting	15	32	52	32
recreation sites	50	75	90	90
access	95	140	360	210
WILDERNESS	15	15	15	15
CULTURAL RESOURCES	10	93	110	110
REFUGE OPERATIONS: stock ponds, maintenance, etc.	82	162	155	172
VOLUNTEERS and FRIENDS	0	20	33	32
PRIORITY LAND ACQUISITIONS	4,000	4,000	4,000	4,000
INTERPRETIVE CENTER: building		8,000	8,000	8,000
exhibits		100	750	500
Subtotal of one-time costs over 15 years	7,945	19,569	18,872	20,356
Salaries over 15 years	41,310	45,193	56,288	56,351
Total Cost	49,255	64,762	75,160	76,707

Table 6. Personnel to carry out the CCP alternatives for the Charles M. Russell and UL Bend refuges.

<i>Alternative A (Current Personnel)</i>	<i>Alternative B</i>	<i>Alternative C</i>	<i>Alternative D</i>
Headquarters (Lewistown, Montana)			
Project leader GS*-14	Project leader GS-14	Project leader GS-14	Project leader GS-14
Deputy project leader GS-13			
Pilot/wildlife biologist GS-12	Pilot/wildlife biologist GS-12	Pilot/wildlife biologist GS-12	Pilot/wildlife biologist GS-12
Wildlife refuge specialist GS-9	Wildlife refuge specialist GS-9	Outdoor recreation planner GS-9	Outdoor recreation planner GS-9
Maintenance worker WG*-8	Maintenance worker WG-8	Maintenance worker WG-8	Maintenance worker WG-8
Maintenance worker WG-7	Maintenance worker WG-7	Maintenance worker WG-7	Maintenance worker WG-7
Supervisory wildlife biologist GS-13			
**Wildlife biologist GS-12	Wildlife biologist GS-12	Wildlife biologist GS-12	Wildlife biologist GS-12
Wildlife biologist GS-9	Wildlife biologist GS-9	Wildlife biologist GS-9	Wildlife biologist GS-9
Wildlife biologist GS-9	Wildlife biologist GS-9	Wildlife biologist GS-9	Wildlife biologist GS-9
Fire management officer GS-12	Refuge complex fire management officer GS-13	Refuge complex fire management officer GS-13	Refuge complex fire management officer GS-13
Administrative officer GS-11	Administrative officer GS-11	Administrative officer GS-11	Administrative officer GS-11
Administrative assistant GS-6	Administrative assistant GS-6	Administrative assistant GS-6	Administrative assistant GS-6
Administrative assistant (term) GS-4			
—	—	Outdoor recreation planner GS-11	Outdoor recreation planner GS-11
Fort Peck Field Station			
Station manager GS-12	Station manager GS-12	Station manager GS-12	Station manager GS-12
Assistant station manager GS-9			
Biological technician GS-6	Biological technician GS-6	Biological technician GS-6	Biological technician GS-6
—	Outdoor recreation planner GS-7/9	Outdoor recreation planner GS-7/9	Outdoor recreation planner GS-7/9
—	Law enforcement officer GS-7/9	Law enforcement officer GS-7/9	Law enforcement officer GS-7/9
—	Range technician GS-5/6	Range technician GS-5/6	Range technician GS-5/6

Table 6. Personnel to carry out the CCP alternatives for the Charles M. Russell and UL Bend refuges.

<i>Alternative A (Current Personnel)</i>	<i>Alternative B</i>	<i>Alternative C</i>	<i>Alternative D</i>
Jordan Field Station			
Station manager GS-12	Station manager GS-12	Station manager GS-12	Station manager GS-12
Assistant station manager GS-7/9	Assistant station manager GS-7/9	Assistant station manager GS-7/9	Assistant station manager GS-7/9
Range technician GS-6	Range technician GS-6/7	Range technician GS-6/7	Range technician GS-6/7
Sand Creek Field Station			
Station manager GS-12	Station manager GS-12	Station manager GS-12	Station manager GS-12
Assistant station manager GS-9	Assistant station manager GS-9	Assistant station manager GS-9	Assistant station manager GS-9
Assistant fire management officer GS-9	Assistant fire management officer GS-9	Assistant fire management officer GS-9	Assistant fire management officer GS-9
Biological technician GS-6	Biological technician GS-6	Biological technician GS-6	Biological technician GS-6
Law enforcement officer GS-9	Law enforcement officer GS-9	Law enforcement officer GS-9	Law enforcement officer GS-9
Range technician GS-7	Range technician GS-7	Range technician GS-7	Range technician GS-7
Maintenance worker WG-8	Maintenance worker WG-8	Maintenance worker WG-8	Maintenance worker WG-8
Student Career Experience Program student GS-4	—	***Outdoor recreation planner GS-7/9	***Outdoor recreation planner GS-7/9
UL Bend National Wildlife Refuge			
—	Refuge operations specialist GS-9/11	Station manager GS-9/11	Station manager GS-9/11
—	Technician GS-5/6	Maintenance worker WG-6/7	Technician GS 5/6
—	—	Maintenance worker WG-7/8	Maintenance worker WG-7/8
Seasonal Employees			
1 Fire seasonal GS-5	<i>Fill to meet needs</i>	<i>Fill to meet needs</i>	<i>Fill to meet needs</i>
2 Fire seasonals GS-4	<i>Fill to meet needs</i>	<i>Fill to meet needs</i>	<i>Fill to meet needs</i>
11 Fire seasonals	<i>Fill to meet needs</i>	<i>Fill to meet needs</i>	<i>Fill to meet needs</i>
7 Biological technician seasonals GS-3	<i>Fill to meet needs</i>	<i>Fill to meet needs</i>	<i>Fill to meet needs</i>

*GS=General Schedule employee by pay grade; WG=Wage Grade employee by pay grade.

**Many of the existing staff have expertise and education in range management. They would qualify as range conservation specialists and could be put into that position series. Monitoring for range health generally involves looking at the dominant community plants, mostly grasses, and determining if they are viable, versus the refuge's wildlife habitat monitoring program, which includes looking at all the plants that comprise the community and ensuring that they are healthy, vibrant, and able to reach maturity.

***Dependent on Interpretive Center being built at Sand Creek Field Station.

3.15 Comparison of Alternatives

Table 7 is a summarized, side-by-side look at the actions for each alternative. An analysis of these actions is in Chapter 5—Environmental Consequences; a summary of the expected consequences of the alternatives is in table 56 at the end of chapter 5.



Table 7. Comparison of actions for the CCP alternatives for Charles M. Russell and UL Bend refuges.

<i>Alternative A</i> —No Action	<i>Alternative B</i> —Wildlife Population Emphasis	<i>Alternative C</i> —Public Use and Economic Use Emphasis	<i>Alternative D</i> —Ecological Processes Emphasis (Proposed Action)
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Goal for Habitat and Wildlife Management: Conserve, restore, and improve the biological integrity, environmental health, and ecological diversity of the refuge’s plant and animal communities of the Missouri River breaks and surrounding prairies to support healthy populations of native plants and wildlife. Working with others, reduce and control the spread of nondesirable, nonnative, invasive plant and aquatic species for the benefit of native communities on and off the refuge.

Goal for Threatened and Endangered Species and Species of Concern: Contribute to the identification, preservation, and recovery of threatened and endangered species and species of concern that occur or have historically occurred in the northern Great Plains.

Goal for Research and Science: Advance the understanding of natural resources, ecological processes, and the effectiveness of management actions in the northern Great Plains through compatible scientific investigations, monitoring, and applied research.

Goal for Fire Management: Manage wildland fire using a management response that promotes fire’s natural role in shaping the landscape while protecting values at risk.

Habitat—Upland

Maintain current habitat regime on 65 habitat units through a fire suppression program, use of livestock grazing (mostly annual grazing versus prescriptive), an emphasis on big game, fencing, and water development.

Continue current monitoring of residual cover.

Manage for a diverse plant community of highly productive wildlife food and cover plants emphasizing target species.

Create these conditions using natural ecological processes (fire management, grazing by wildlife, or flooding) or active management practices (prescriptive grazing, prescribed fire, or agricultural plantings).

Within 3 years, develop new HMPs based on field station boundaries and evaluation of needs of target species.

Evaluate success through monitoring of residual cover, sentinel plants, and other measures.

Use more intensive manipulation to remove junipers for protection of existing trees from wild-fire.

Similar to A, except:

Manage the present habitat units for improving range conditions for domestic and wild ungulates using NRCS ecological site conditions and guidelines.

Manage habitat to support maximum opportunities for wildlife-dependent recreation, and manage for a plant community that is a compromise between wildlife food and cover and livestock forage needs.

Within 7 years, develop new HMPs based on soil characteristics, historical fire occurrence, grazing, and field station boundaries.

Include fencing for better livestock distribution, water development, rotational grazing, and other management techniques designed to improve range conditions.

In cooperation with NRCS, conduct ecological site evaluations on habitat units, monitoring residual cover and sentinel plant species. Continue current monitoring of residual cover.

Promote ecological resilience (where the land can absorb disturbance and still retain its basic function and structure), restore fire-grazing interactions, promote animal movement with long periods of abandonment to reduce plant species selectivity for sentinel species, and increase landscape species and structural heterogeneity.

Mimic and restore natural processes and manage for diversity of plant species within the community.

Initially use active management such as manipulation of habitats or wildlife populations using food plots, managing water levels, and relocating wildlife; but move toward using more passive approaches such as allowing natural processes such as fire and flooding and using prescriptive grazing.

Mimic ecological processes using fire and herbivory (grazing) by wild ungulates or livestock, or both, as prescribed to maintain plant diversity.

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Habitat—Upland (continued)			
			<p>Sustain viable populations of plant species that are first to decline when management practices are injurious (sentinel species).</p> <p>When feasible, restore the natural fire regime through an increased use of prescribed fire to increase diversity of all fire-dependent species where necessary to restore natural processes and conditions.</p> <p>Consolidate 65 habitat units into 3–8 units, and develop new HMPs based on soil characteristics and historical fire conditions.</p>
Habitat—River Bottom			
<p>Restore small acreages of bottomlands when funding allows.</p>	<p>Develop and implement an aggressive approach to treating the bottomlands on a prioritized basis. Treatment would include burning and spraying with herbicides to clear invasive plants and planted with wildlife food crops.</p> <p>Increase fencing where needed to exclude livestock from river bottoms except for developed water gaps where necessary.</p>	<p>Rely on partnerships and cooperators to restore river bottoms.</p> <p>Less aggressive timeframe for restoration of river bottoms than under alternative D and would enable economic benefits from crops produced.</p>	<p>More aggressive timeframe for restoration of river bottoms than C; more emphasis on native plant restoration.</p>
Habitat—Riparian Area and Wetland			
<p>Maintain the current stream riparian habitat managed through a fire suppression program, big game emphasis, and livestock grazing, fences, and water development.</p>	<p>Resurvey the health of streams.</p> <p>Over 15 years, remove all reservoir and stock ponds that do not support species of concern (for example, redbelly and finescale dace).</p> <p>Determine if other stock ponds are needed to meet requirements for target species.</p> <p>Restore properly functioning conditions (support productive populations of native fish species) where feasible.</p>	<p>Resurvey the health of streams.</p> <p>Within 10 years, evaluate current stock ponds and determine which ponds need to be rehabilitated or are needed to meet grazing needs.</p> <p>Within 5 years, determine potential of and prioritize selected sites for stream-bank stabilization; eliminate bank hoof shearing.</p>	<p>Similar to B and C, except:</p> <p>Over 15 years, provide alternate water sources for cattle where prescriptive grazing is required to accomplish habitat objectives away from riparian areas or sensitive areas.</p> <p>Over 15 years, identify locations along riverbanks for stabilization and revegetation and restore 50%–75% of those locations.</p>

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Habitat—Riparian Area and Wetland (continued)			
	<p>Identify and prioritize riverbanks in need of stabilizations and revegetation and restore 50% of those locations.</p> <p>Fence out livestock from all riparian areas with the exception of developed water gaps.</p> <p>Use flooding as tool.</p>	<p>Over 15 years on priority streams, restore using a variety of methods that improve water quality and quantity, stabilize stream banks, improved channeling, etc.</p>	<p>Over 15 years, restore natural hydrology to five first-, second-, and third-order streams that would normally flow into the Missouri or Musselshell.</p> <p>Use exclosures in riparian areas.</p> <p>Manage for diversity of plant species within the stream riparian community using natural processes.</p> <p>Study and preserve areas where with longer fire intervals (refugia).</p> <p>Conduct research on site hydrology and restore dynamic hydrological processes where possible.</p>
Habitat—Shoreline			
<p>Continue to combat invasive plants (mostly salt-cedar). If Fort Peck Lake levels rise to historical levels, revisit treatment of shoreline areas.</p>	<p>Increase efforts to combat invasive plants through partnerships, etc. Plant native species in treatment areas. Manipulate shoreline by mechanical means as necessary to improve populations of fish, birds, or other wildlife.</p>	<p>Same as A, plus:</p> <p>Work with USACE to ensure access to Fort Peck Lake for recreational activities as lake levels vary.</p>	<p>Same as B, plus:</p> <p>Encourage growth of native vegetation.</p> <p>Enhance opportunities to benefit plovers and terns, and other species of Federal and State concern along the shoreline.</p>
Habitat—Invasive Species			
<p>Continue to use the weed strike team.</p> <p>Continue to update invasive species mapping.</p> <p>Maintain existing invasive species control programs including mapping program of existing and invasive species, biocontrol research project with USDA, releasing of at least two biocontrol agents, weed-seed-free hay requirements.</p> <p>Maintain active bottomland restoration program.</p> <p>Continue partnership to provide free car washes for refuge visitors.</p>	<p>Same as A, plus:</p> <p>Aggressively reduce weeds and replace with native plants. Convert former croplands infested with weeds into food plots >3000 acres.</p> <p>Consider crop rotation in bottomlands.</p> <p>Continue cooperative effort with USACE on salt-cedar removal.</p> <p>Emphasize visitor education about weeds and aquatic invasives (for example, zebra mussels) and increase public awareness and enforcement.</p> <p>Consider additional weed-free restrictions for outfitters and permittees.</p>	<p>Same as B, plus:</p> <p>Emphasize visitor education about weeds.</p> <p>Increase public awareness and enforcement.</p> <p>Implement controls and education programs, and increase awareness of the growing problem of aquatic invasives (for example, zebra mussels).</p>	<p>Same as B and C, plus:</p> <p>Evaluate the biological potential and economical feasibility to use more biological control measures when proven safe and effective and less chemical control to reduce weed infestations.</p>

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Habitat—Water Resources			
<p>Continue restoring riparian habitat and adhere to standard watershed management practices as funding allows.</p> <p>Continue working with USGS and the State on water quality studies and standards.</p> <p>Maintain and rehabilitate select stock ponds.</p> <p>Continue to cap artesian wells to prevent depletion of groundwater. (Same as B, C, and D.)</p>	<p>Restore water quality for fish and wildlife by addressing soil erosion from overgrazing, roads, or other sources, and contamination from recreational or economic use (for example, excessive livestock use of streams and human use of camping areas).</p> <p>Retain ground cover across the refuge to increase groundwater flow into streams, and reduce runoff and soil erosion and protect riparian corridors.</p> <p>Encourage natural water development within streams such as increased flow, pools, and beaver ponds and artificial water such as dugouts to benefit wildlife populations.</p> <p>Evaluate current and future stock dam needs especially in high functioning watersheds to determine cumulative impacts on stream flow fish and riparian conditions.</p> <p>Evaluate current and future water development on a site-specific basis and consider effects (positive and negative to all resources).</p>	<p>Balance water quality restoration with public use and economic needs. Restore water quality for fish and wildlife by addressing soil erosion from overgrazing, roads, or other sources, and contamination from recreational or economic use (for example, excessive livestock use of streams and human use of camping areas).</p> <p>Retain ground cover across refuge to increase groundwater flow into streams, and reduce runoff and soil erosion and protect riparian corridors. (Same as B.)</p> <p>Encourage natural and constructed water sources for livestock and public fishing and hunting opportunity.</p> <p>Evaluate current and future water development on a site-specific basis and consider effects (positive and negative) to all resources.</p>	<p>Restore water quality for fish and wildlife by addressing soil erosion from overgrazing, roads, or other sources, and contamination from recreational or economic use (for example, excessive livestock use of streams and human use of camping areas). (Same as B.)</p> <p>Retain ground cover across refuge to increase groundwater flow into streams, and reduce runoff and soil erosion and protect riparian corridors. (Same as B.)</p> <p>Reference riparian research and publication for guidance on restoring or improving water quality in identified areas.</p> <p>Assess the needs of current reservoirs and restore historical hydrologic condition of reservoirs no longer needed for livestock or wildlife.</p> <p>Maintain and rehabilitate select stock ponds.</p>
Habitat—Water Rights			
<p>Adjudicate, define, and quantify water rights.</p>	<p>Same as A, plus:</p> <p>Pursue acquiring water rights associated with purchasing in-holdings and obtaining senior upstream water rights only when approached by landowner or current water right holder.</p>	<p>Same as B.</p>	<p>Same as B.</p>

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Habitat—Grazing			
<p>Continue to manage 65 habitat units with livestock (1986 EIS). (In 2009, 55 units have active permits.)</p> <p>Retire livestock grazing permits as they become available (i.e., ranch changes ownership, but this would not include generational transfer).</p> <p>Maintain fencing.</p> <p>Gradually move toward prescriptive grazing to manage grazing (defined as use of specific, written directions to achieve a desired outcome) as units become available, and/or habitat evaluations are completed, and action is necessary to meet wildlife or habitat objectives.</p>	<p>Actively work toward reducing livestock grazing permits to only use prescriptive grazing as a management tool to achieve specific habitat or wildlife objectives, or where use of other management tools may not be feasible.</p> <p>Remove livestock grazing from all habitat units that are fenced separately from surrounding lands. Use only prescriptive grazing.</p> <p>Within 4–7 years, prescriptive grazing would be developed for 50%–75% of the refuge.</p> <p>Remove interior fencing where appropriate.</p> <p>Fence boundary to exclude common pastures and allow the Service to affect management treatments to meet wildlife objectives.</p>	<p>Take a passive approach in gradually moving toward a prescriptive grazing program as current grazing permits become available due to a ranch changing ownership (this would not include generational transfer).</p> <p>Up to 50% of the refuge would be under prescriptive grazing.</p> <p>If monitoring reveals that populations of the first-to-decline sentinel plant species for grazing and browsing are not viable, balance reductions in livestock permit numbers and wild ungulates numbers.</p> <p>Consider designating administrative use-only roads for livestock management where appropriate and allowed by policy and laws.</p>	<p>Adopt an active approach to using prescriptive grazing as a management tool (less aggressive than B). Shift from traditional annual permitted grazing to prescriptive grazing to enhance habitats for wildlife. Within 6–9 years, develop 50%–75% of the refuge for prescriptive grazing.</p> <p>If monitoring reveals that the first-to-decline grazing and browsing sentinel plant populations are not viable, initiate changes in livestock permits (reduce AUMs or retire a permit).</p> <p>Remove interior fences to facilitate long-distance animal movements and use of prescribed fire.</p> <p>Fence boundary.</p> <p>Allow for generational transfer to continue under a prescriptive program.</p>
Habitat—Prescribed Fire			
<p>Continue the fire suppression policy.</p> <p>Manage habitat with minimal use of prescribed fire.</p>	<p>Increase use of prescribed fire to enhance wildlife populations and habitat and reduce hazard fuel.</p> <p>Monitor the effects of prescribed fire on the habitat and wildlife populations.</p> <p>Work with partners to address wildland-urban interface areas at the Pines Recreation Area and other USACE recreation areas.</p>	<p>Same as B, except:</p> <p>Use prescribed fire to create a balance between enhanced wildlife habitat and improved forage for livestock.</p>	<p>Use patch burning (burn patches of varying sizes, within historical fire-return intervals, and on a rotation to create a mosaic of habitats) to restore heterogeneity (diversity) within landscapes, preserve fire refugia and associated plant species, enhance food resources for wildlife, and ensure biological diversity and integrity and environmental health.</p> <p>Move toward allowing fire to play its natural role in shaping the ecosystem in adherence with the fire management plan. Monitor the effects of fire on the habitat and wildlife populations. (Same as B.)</p> <p>Work with partners to address wildland-urban interface areas. (Same as B.)</p>

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Habitat—Wildfire			
<p>Continue fire suppression using a management response strategy that evaluates the response to a wildfire based on a number of factors including risks to firefighters, the public, property, and other resources.</p>	<p>Identify and take the appropriate and necessary fire management actions, according to an approved fire management plan and maintain or improve wildlife habitat during a wildfire.</p>	<p>Use aggressive initial attack to minimize economic loss from wildfire. Increase prescriptive grazing to minimize fuel loading.</p>	<p>Using historical fire frequency data, manage naturally occurring wildfire for multiple objectives and implement actions in accordance with an approved fire management plan. Monitor the effects of fire on the habitat and wildlife populations.</p>
Habitat—Climate Change			
<p>Maintain current efforts to reduce the carbon footprint including maintaining a wind turbine, recycling, building energy-efficient facilities, and using energy-efficient vehicles.</p> <p>Consider what conditions precipitated by climate change the refuge may have to deal with: increased drought, longer fire season, hotter fires, loss of plants and animals, increase of other plants and animals, change of migration patterns, and relocation of species.</p>	<p>Same as A, plus:</p> <p>Based on climate change predictions, identify species of plants that are likely to be first to decline; animals that are associated with these plant species including insects, birds, and mammals; and species of plants and animals that would increase.</p> <p>Design science-based long-term monitoring protocols to document changes in plant and animal composition or health due to climate change.</p> <p>Coordinate with adjoining agencies and partners to immediately alleviate the declines (and increases) on sites with appropriate modification of ecological processes (management action) such as herbivory, fire, or flooding.</p> <p>Cooperate with national and international projects to maintain biological diversity, integrity, and environmental health on global basis.</p> <p>Replace all vehicles with fuel-efficient vehicles. Upgrade offices to “green” standards. Install solar panels and wind turbines. Provide recycling bins. Encourage teleconferencing instead of driving, turning off lights, recycling, and turning down heat.</p>	<p>Same as B.</p>	<p>Same as B.</p>

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Wildlife—Big Game			
<p>Improve and/or maintain elk, mule deer, pronghorn, and bighorn sheep in good to excellent condition.</p> <p>Continue to manage for 10 mule deer per square mile, 2.5 elk per square mile.</p>	<p>Coordinate surveys and research with MFWP.</p> <p>Manage elk and mule deer populations at highest levels possible without negatively affecting habitat or other wildlife species. Manage harvest levels for herd sex and age ratios similar to unhunted or lightly harvested populations.</p> <p>Monitor pronghorn abundance and distribution.</p> <p>Expand huntable population of bighorn sheep in suitable and unoccupied habitat (east of Timber Creek and south of the Missouri River into the Seven-Blackfoot, Snow Creek, and Hell Creek areas).</p> <p>Determine mountain lion population levels.</p>	<p>Manage elk and deer populations at levels consistent with MFWP objectives and landowner tolerance.</p> <p>Manage pronghorn and bighorn sheep similar to alternative B.</p> <p>Within 10 years, implement a mountain lion hunt if monitoring data shows it is warranted.</p>	<p>Develop cooperative monitoring programs with MFWP for big game populations and habitat by 2015 to establish desired population levels, herd composition targets, and harvest strategies for elk, deer, and bighorn sheep.</p> <p>Determine mountain lion levels and consider harvest if monitoring shows it could be sustained.</p>
Wildlife—Furbearers and Small Predators			
<p>Continue to allow coyote hunting at the start of pronghorn season through March 1.</p> <p>Maintain active predator management by the U.S. Department of Agriculture on a limited basis.</p> <p>Allow no predator hunting or trapping.</p>	<p>Manage predatory species as an important component of the wildlife community.</p> <p>Eliminate active predator management by the U.S. Department of Agriculture.</p>	<p>Increased predator management through an expanded predator-hunting program to benefit economic uses and provide more public recreational opportunities.</p> <p>Consider allowing trapping.</p>	<p>Ensure that the top-down effects of predation on prey species and plant species is a functioning component in restoration of biological diversity, integrity, and environmental health.</p> <p>Eliminate active predator management by the U.S. Department of Agriculture.</p>
Wildlife—Reintroductions			
<p>No new reintroductions. Past reintroductions: black-footed ferrets, prairie dogs, bighorn sheep, and elk (1950s). Turkeys reintroduced by MFWP adjacent to the refuge.</p>	<p>Cooperate with partners on potential reintroductions of black-footed ferrets, swift fox, pallid sturgeon, bighorn sheep, and prairie dogs (if necessary due to plague).</p> <p>Cooperate with State and partners on the potential reintroduction of bison as wildlife in the landscape.</p>	<p>Cooperate with partners on the reintroduction of and expansion of the bighorn sheep population for expanded hunting.</p> <p>Consider no other reintroductions.</p>	<p>Cooperate with partners to restore the biological integrity and ecological processes of the site where practical for reintroduction of extirpated species.</p> <p>Cooperate with the State to consider species reintroductions when the landscape has been prepared and accepted by the public.</p>

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Wildlife—Birds			
<p>Maintain habitat to support 30 spring-breeding sharp-tailed grouse per square mile when conditions permit.</p> <p>Maintain riparian areas to benefit waterfowl, kingbird, mourning dove, American kestrel, ring-neck pheasant, and turkey. Improve waterfowl habitat on all suitable ponds.</p> <p>Maintain two peregrine falcon eyries.</p>	<p>Complete a baseline inventory of the relative abundance of birds using the refuge. Establish a monitoring program for at least 75% of the highest priority bird species (top 7–10 species), completing management plans tied to the habitat management program.</p>	<p>Similar to B except establish a monitoring program for 50% of the highest priority bird species. Specifically, look at greater sage-grouse and sharp-tailed distribution and how they are affected by habitat objectives.</p>	<p>Similar to B except establish a monitoring program 90% of highest priority bird species.</p>
Wildlife—Other Wildlife			
<p>Little to no monitoring or management.</p>	<p>Within 2 years, assess the need for baseline inventory plans or research for fish, reptiles, amphibians, invertebrates and small mammals. Prioritize the highest needs (top 7–10) for research, particularly those species that support the habitat-monitoring program.</p> <p>Within 15 years, complete 75%–100% of the highest priority inventory plans.</p>	<p>Similar to Alternative B on monitoring and research.</p> <p>Work with partners to enhance fishing opportunities.</p>	<p>Same as B.</p>
Threatened and Endangered Species and Species of Concern			
<p>Continue to inventory and monitor threatened and endangered species and implement recovery plans. Listed species include black-footed ferret, least tern, pallid sturgeon, and piping plover. The grizzly bear and gray wolf are listed species that occur in Montana, but none are found on refuge.</p> <p>Continue efforts in black-footed ferret recovery including the release of animals, intensive monitoring, and disease and habitat management.</p>	<p>Same as A, plus:</p> <p>Actively manipulate habitats to promote the recovery of threatened and endangered species. In critical habitat areas for select threatened and endangered species, ensure listed species are given highest priority.</p> <p>Develop management plans for the grizzly bear and gray wolf in accordance with Federal and State regulations and plans for management of these species should natural migration to the refuge occur.</p>	<p>Same as B, except:</p> <p>Less intensive manipulation of threatened and endangered species habitat. Balance threatened and endangered species needs with public and economic use needs.</p>	<p>Same as B, except:</p> <p>Protect current listed species/habitat, and work collaboratively with partners to prevent other species from being listed by restoration of biological diversity, integrity, and environmental health throughout the landscape.</p>

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Threatened and Endangered Species and Species of Concern (continued)			
<p>No current plan for managing wolves should they migrate to refuge. Work with MFWP and others when reports of depredations by wolves occur around refuge.</p> <p>Continue surveying for State species of concern: mountain plover, least tern, sage-grouse, paddlefish, swift fox, and prairie dogs.</p>			
Goal for Public Use and Education: Provide all visitors quality education, recreation, and outreach opportunities that are appropriate and compatible with the purpose and goals of the refuge and the mission of the Refuge System while maintaining the remote and primitive experience unique to Charles M. Russell National Wildlife Refuge.			
Public Use—Hunting			
<p>Maintain current hunting programs, which includes ungulates, upland birds, and waterfowl is currently allowed. Maintain a limited coyote season.</p> <p>Shooting of nongame species is not allowed. Trapping is not allowed. Shed hunting (collecting antlers) is not allowed. Protect all other wildlife.</p>	<p>Work with MFWP to provide quality hunting opportunities that maintain sustainable populations of big game and habitat for nongame species.</p>	<p>Work with MFWP to provide maximum hunting opportunities and expand the following:</p> <ul style="list-style-type: none"> —hunting programs to include new species and traditional/niche (primitive weapon) —hunts for young people —mule deer season —predator hunting and allow for trapping 	<p>Work with MFWP to provide hunting opportunities that maintain big game and other species at levels that restore biological diversity and integrity, and environmental health.</p> <p>Consider a limited predator hunting and trapping program.</p>
Public Use—Fishing			
<p>Continue to follow State regulations.</p> <p>Continue cooperation with MFWP to regulate paddlefishing.</p>	<p>Provide opportunities for quality fishing that maintains both sustainable populations of game and nongame fish.</p>	<p>Provide increased fishing access to areas not accessible due to changing lake level.</p> <p>Consider permitting vehicular shoreline access to ice fishing in the winter.</p> <p>Stock select livestock reservoirs to create more fishing opportunities.</p> <p>Increase participation by youth and fishing groups.</p>	<p>Cooperate with other agencies and partners to enhance fishing opportunities that maintain game species and other species at levels that restore biological diversity and integrity, and environmental health where possible within the refuge.</p>
Public Use—Wildlife Observation, Photography, and Interpretation			
<p>Maintain elk-viewing areas, trails, auto tour route, and other facilities that provide opportunities for wildlife observation, photography and interpretation to support 40,000 visits.</p>	<p>In 5 years, develop and complete visitor services plan and visitor experience survey; hire one outdoor recreation planner.</p>	<p>In 5 years, develop a visitor services plan and conduct a visitor experience survey; hire two outdoor recreation planners.</p>	<p>In 5 years, develop and complete a visitor services plan and conduct a visitor experience survey; hire two outdoor recreation planners.</p>

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Public Use—Wildlife Observation, Photography, and Interpretation (continued)			
	<p>Over 15 years, increase participation in nonconsumptive uses by 5%–10% annually (2,000–4,000 more visits).</p> <p>Over 15 years, increase the quality of and number of facilities by 5%–10% over alternative A. Provide more viewing or photography opportunities by sustaining high populations of wildlife (migratory birds, big game, prairie dogs, etc.).</p> <p>Update existing signage, website and other interpretive media and facilities as needed. (Same as C and D.)</p>	<p>Over 15 years, increase participation in nonconsumptive uses by 20%–50% annually (8,000–20,000 more visits).</p> <p>Over 15 years, increase the quality and number of facilities and programming by 5%–15% over alternative A. Develop new facilities that expand opportunities for wildlife observation and photography.</p> <p>Identify new areas for wildlife viewing.</p> <p>Increase opportunities for ecotourism.</p> <p>Consider ways to encourage more youth to visit the refuge (such as geocaching or other Internet tools).</p> <p>Increase interpretation of paleontological resources.</p>	<p>Over 15 years, increase participation in nonconsumptive uses by 15%–25% (6,000–10,000) more visits.</p> <p>Over 15 years, increase the quality and number of facilities and programming by 10% over alternative A. Provide for opportunities to see a diversity of healthy habitats that sustain the full spectrum of plant and animal species found in the area.</p>
Public Use—Environmental Education			
<p>Maintain limited environmental education programming (for example, school visits and fair booths).</p> <p>Maintain interpretative center, kiosks, and other facilities.</p> <p>Continue to serve as a destination for troubled youth groups.</p>	<p>Expand environmental education program by 5% (program elements identified in the visitor services plan) based on wildlife biology and habitat requirements.</p> <p>Work with additional partners to expand interpretive and educational opportunities.</p>	<p>Expand environmental education program by 25% and focus on threatened and endangered species, reintroduced species and restoration, and aquatic invasives.</p> <p>Increase programming levels for troubled youth groups.</p>	<p>Expand environmental education program by 10% and focus on ecological processes, biological diversity and integrity, environmental health.</p>
Public Use—Opportunities for Visitors with Disabilities			
<p>Continue to provide an accessible blind for persons with disabilities.</p> <p>Continue support for USACE’s closure of an area to provide deer hunting opportunities for persons with disabilities.</p>	<p>Same as A, plus: Adaptively manage wildlife-dependent recreation opportunities to meet the needs of visitors with disabilities.</p>	<p>Same as B, plus: Collaborate with other agencies to increase accessibility for wildlife recreation. Provide additional accessible facilities.</p>	<p>Same as B, plus: Upgrade existing facilities to meet current standards for accessibility and increase accessibility where appropriate. Adaptively manage for an aging hunting population.</p>

Table 7. Comparison of actions for the CCP alternatives for Charles M. Russell and UL Bend refuges.

<i>Alternative A</i> —No Action	<i>Alternative B</i> —Wildlife Population Emphasis	<i>Alternative C</i> —Public Use and Economic Use Emphasis	<i>Alternative D</i> —Ecological Processes Emphasis (Proposed Action)
Public Use—Other Activities in Support of Priority Public Uses			
Continue allowing the following uses: —horseback riding throughout the refuge and all-terrain vehicle use on public roads within the refuge —biking on numbered roads, which include seasonally closed roads —permit public planes to land only on water or ice determined by USACE’s plan	Same as A, except: Use adaptive management as various uses increase. Disallow new secondary recreational uses unless it facilitates a wildlife-dependent recreational use.	Same as A, except: Use adaptive management as various uses increase.	Same as C.
Public Use—Access			
(Alternative A only.) Maintain existing refuge roads (670 miles). Keep roads closed in the proposed and designated wilderness. Continue the limited seasonal closure of roads when necessary. Continue to work with USACE on management of boat ramps (In 2009, 9 out of 15 boat ramps have access to water). Rock Creek is only boat ramp under Service jurisdiction. Develop a travel management plan (step-down plan) in cooperation with partners to ensure secured public access. Allow current access to private inholdings to continue.	Similar to A, except or plus: Reduce some existing roads to benefit wildlife populations. If deemed necessary to close 106 miles of road to meet habitat objectives, manage roads and access to promote more harvest opportunities and larger wildlife populations. Promote nonmotorized access, but consider allowing motorized access on existing roads for retrieval only. Restrict access on a seasonal basis to sensitive areas by river and road. Monitor all-terrain vehicle use on numbered trails and manage if document disturbance issues (both wildlife and visitor use). Work with USACE and other agencies to monitor boat use and determine if disturbance is an issue, then work with cooperators and users to manage access to certain areas (for example, harden ramps) to limit disturbance to wildlife along river corridor.	Similar to A, except or plus: Manage access to benefit public and economic use. Consider expanding access (establish new roads) in some areas and closing other areas seasonally, especially in Fort Peck for protection of habitat and to provide a diversity of experience. Improve access to boat ramps. Promote nonmotorized access, but consider allowing motorized access on existing roads for retrieval only. Work within existing policies to allow livestock permittees to manage infrastructure and stock within habitat units. Evaluate creating trails that are open for bicycle use.	Similar to A, except or plus: Manage access to benefit natural processes and habitat. Close 23 miles of road as needed to encourage free movement of animals, permit prescribed patch burning, harvest of wild ungulates, or other activities that contribute to biological diversity, integrity, environmental health, or historical conditions. Work with USACE and other agencies to monitor boat use and determine if disturbance is an issue, then work with cooperators and users to manage access to certain areas (for example, harden ramps) to limit disturbance to wildlife along river corridor. Monitor all-terrain vehicle use on numbered trails and manage if document disturbance issues (both wildlife and visitor use). Continue to restrict bicycles to numbered roads only including seasonally closed roads.

Table 7. Comparison of actions for the CCP alternatives for Charles M. Russell and UL Bend refuges.

<i>Alter-native A</i> —No Action	<i>Alternative B</i> —Wildlife Population Emphasis	<i>Alternative C</i> —Public Use and Economic Use Emphasis	<i>Alternative D</i> —Ecological Processes Emphasis (Proposed Action)
Public Use—Recreation Sites			
Continue allowing camping within 100 yards of roads.	Same as A, except: Use adaptive management as use increases. Manage vehicular camping to fit the use (i.e., paddle-fishing and concentrated camping vs. big game hunting and dispersed camping) and ensure protection of surrounding habitat. Permit backcountry camping.	Same as A, except: Use adaptive management as use increases. Establish new campsites and campgrounds. Look to create designated horse camps and evaluate the need for designating camp-sites along the lake to meet increased demand and lessen the impact on shore-line habitat.	Same as A, except: Use adaptive management as use increases. Evaluate and address camping needs as use changes on the refuge. Use adaptive management to address camping demand (for example, harden frequently used sites to minimize erosion and impact to habitat). Limit camping to within 100 yards of numbered routes.
Public Use—Commercial Recreation			
Continue to offer 11 outfitting permits for hunting. Commercial outfitting for coyote hunting is illegal.	Permit commercial recreation when it benefits fish and wildlife populations. Develop additional commercial backcountry outfitting permits for hunting that accomplish habitat/wildlife objectives.	Permit commercial recreation when it benefits public or economic use. Increase commercial opportunities and increase the promotion of ecotourism tours and experiences. Increase outfitting permits to the point that they do not impact public hunting.	Only permit commercial recreation when it benefits natural ecological processes or habitats (e.g., allow commercial activities in roadless areas that facilitate big-game harvest to meet wildlife and/or habitat objectives).
Goal for Wilderness: Conserve, improve, and promote the wilderness quality and associated natural processes of designated and proposed wilderness within Charles M. Russell National Wildlife Refuge for all generations.			
Wilderness			
Manage UL Bend Wilderness as class 1 air shed. Within 2 years, submit a final report on the wilderness study to Washington. Follow Service policy to manage proposed wilderness. Evaluate use of all tools in wilderness.	Same as A, except: Over 15 years and on approval by the Department of the Interior, expand proposed wilderness units totaling about 25,037 acres.	Same as A, except: Over 15 years and on approval by the Department of the Interior, eliminate four proposed wilderness units totaling 35,881 acres.	Same as A, except: Over 15 years and on approval by the Department of the Interior, expand six wilderness units totaling 18,559 acres and eliminate three units totaling 26,744 acres.
Goal for Cultural and Paleontological Resources: Identify, value, and preserve the significant paleontological and cultural resources of Charles M. Russell National Wildlife Refuge to connect refuge staff, visitors, and the community to the area’s prehistoric and historic past.			
Cultural Resources			
Identify and protect significant cultural resources according to the National Historic Preservation Act and other laws. Identify a sample of homesteads to be protected and interpreted.	Same as A, plus: Create a sensitivity model and conduct surveys in areas with a moderate or high potential for resources. Conduct oral histories to find out about structures.	Same as B, plus: Increase opportunities for ecotourism (nonconsumptive) through tours of historic sites.	Same as B.

Table 7. Comparison of actions for the CCP alternatives for Charles M. Russell and UL Bend refuges.

<i>Alternative A</i> —No Action	<i>Alternative B</i> —Wildlife Population Emphasis	<i>Alternative C</i> —Public Use and Economic Use Emphasis	<i>Alternative D</i> —Ecological Processes Emphasis (Proposed Action)
Cultural Resources (continued)			
<p>Protect known gravesites. Maintain road closures through sensitive cultural resource areas.</p> <p>Maintain the cultural resource inventory.</p> <p>Provide a brochure about the prehistory and history of the refuge.</p>	<p>Complete a comprehensive cultural resources overview.</p> <p>Identify potential preservation projects; work with partners to find funding and implement. Locate and properly curate collections.</p> <p>Develop additional interpretation materials.</p>	<p>Develop brochures and kiosks that interpret cultural resources. Use more interpretive signs (would not identify specific archaeological resources).</p> <p>Partner with others to identify or stabilize resources.</p>	
Paleontological Resources			
<p>Continue to issue permits to professional paleontologists for the collection, curation and study of the resources.</p> <p>Continue to prohibit recreational digging.</p>	<p>Same as A, except:</p> <p>Work with professional paleontologists to develop a step-down plan for the identification, study, and protection of resources.</p> <p>Increase protection and law enforcement.</p>	<p>Same as A, plus:</p> <p>Promote the creation of documentaries and increase educational opportunities.</p> <p>Consider purchase of inholdings for protection.</p>	<p>Same as A, except:</p> <p>Limit or manage special use permits to protect resources.</p>
<p>Goal for Refuge Operations and Partnerships: Through effective communication and innovative use of technology and resources, the refuge uses funding, personnel, partnerships, and volunteer programs for the benefit of natural resources while recognizing the social and economic connection of the refuge to adjacent communities.</p>			
Refuge Operations			
<p>Continue mineral withdrawal until 2013 and work to renew withdrawal.</p> <p>When possible, continue to purchase minerals on fee acquisitions.</p> <p>Adhere to legal obligation for right-of-way for access to private and State lands (includes right-of-way for oil and gas extractions and development of minerals).</p> <p>Personnel—Maintain current personnel levels.</p> <p>Equipment and facilities—Maintain current number of facilities and equipment.</p> <p>Maintain agreements with USACE and cooperate to acquire jurisdiction around the lake to enforce regulations.</p>	<p>Same as A, plus:</p> <p>Personnel—Increase personnel by adding an outdoor recreation planner and additional full-time law enforcement officer and fire specialist on the east end of the refuge, and an assistant manager at Jordan Field Station.</p> <p>Equipment and facilities—Same as A.</p> <p>Land acquisition—Acquire inholdings from willing sellers.</p> <p>Minerals—Same as A, plus seek permanent withdrawal of all minerals, including oil and gas and other leasable and saleable minerals on all refuge lands and future acquisitions.</p>	<p>Same as A, plus:</p> <p>Personnel—Increase personnel by adding an outdoor recreation planner at Fort Peck Field Station and Lewistown Field Station, a full-time law enforcement officer on the east end of the refuge, an assistant manager at Jordan Field Station and manager at UL Bend refuge, and two maintenance positions and a fire specialist on the east end of the refuge.</p> <p>Equipment and facilities—Expand facilities at Jordan Field Station and more office space at Jordan and Sand Creek field stations.</p> <p>Land acquisition—Same as B.</p> <p>Minerals—Same as B.</p>	<p>Same as A, plus:</p> <p>Personnel—Increase personnel by adding an outdoor recreation planner at Fort Peck Field Station and Lewistown Field Station, a full-time law enforcement officer on the east end of the refuge, an assistant manager at Jordan Field Station and manager at UL Bend refuge, and two maintenance positions and a fire specialist on the east end of the refuge.</p> <p>Equipment and facilities—Expand facilities at Jordan Field Station and more office space at Jordan and Sand Creek field stations.</p> <p>Land acquisition—Same as B, plus look to facilitate exchange of State lands within boundary where feasible.</p> <p>Minerals—Same as B.</p>

Table 7. Comparison of actions for the CCP alternatives for Charles M. Russell and UL Bend refuges.

<i>Alter-native A</i> —No Action	<i>Alternative B</i> —Wildlife Population Emphasis	<i>Alternative C</i> —Public Use and Economic Use Emphasis	<i>Alternative D</i> —Ecological Processes Emphasis (Proposed Action)
Partnerships—Land Management			
<p>Maintain existing working relationships and outreach with private landowners and land managers.</p> <p>Examples of landscape management include wildlife movement, habitat management, travel planning, fire suppression, bison, oil and gas lease, and other species of concern (sage-grouse and pronghorn).</p>	<p>Same as A, plus:</p> <p>Emphasize wildlife populations.</p> <p>Emphasize working relationships and outreach with private landowners and land and wildlife managers to improve management of land and wildlife across boundaries.</p> <p>Consider impacts of management actions that affect landscapes within and outside refuge boundaries.</p> <p>Look for opportunities to exchange, consolidate and/or obtain habitat.</p>	<p>Same as B, except:</p> <p>Emphasize public and economic uses.</p> <p>Look at landscape-scale management of all ungulate species in and around refuge to benefit all wildlife species and promote private conservation easements to benefit species diversity and ecological integrity.</p>	<p>Same as B, except:</p> <p>Emphasize habitat and ecological processes.</p> <p>Look at landscape-scale management of all wildlife species in and around refuge to benefit wildlife diversity and health work with local landowners to promote private conservation easements and/or conservation incentives to benefit species diversity and ecological integrity.</p>
Partnerships—Collaboration			
<p>Maintain existing partnerships as described in chapter 3:</p> <ul style="list-style-type: none"> —Federal agencies —MFWP and DNRC on wildlife and habitat management and other State agencies —Conservation districts, county commissioners, fire wardens, weed districts, fire districts, and sheriff departments —Nongovernmental organizations —Adjacent private landowners and local communities <p>Continue to work with partners to promote the refuge as an ecotourism destination.</p>	<p>Same as A, plus:</p> <p>Revisit partnerships and adapt as needed based on new management direction.</p> <p>Work with the USACE on lands that could be transferred to the Service for primary jurisdiction.</p> <p>Pursue additional opportunities for joint management of fire suppression, prescribed fire, and habitat manipulation.</p> <p>Explore land exchange opportunities as they become available (e.g., State, BLM, private, nongovernmental organizations).</p> <p>Develop a road management plan (Federal, State, and county).</p> <p>Look for additional partnerships and money to support increased invasive species control.</p> <p>Develop a friends group.</p>	<p>Same as B, plus:</p> <p>Develop partnerships with the Chamber of Commerce and State tourism board. Work with these and other partners to highlight refuge resources through promotional materials. Work with nongovernmental organizations interested in developing ecotourism opportunities.</p> <p>Develop additional partnerships with various sporting organizations that would support public uses (e.g., Mule Deer Foundation).</p> <p>Explore additional commercial activities such as guided fishing and hunting.</p> <p>Establish more detailed agreements with the fire district for fire suppression.</p> <p>Develop a friends group and expand volunteer groups and provide staff to manage.</p>	<p>Same as C, plus:</p> <p>Revisit partnerships and adapt as needed based on new management direction.</p> <p>Work with the USACE on lands that could be transferred to the Service for primary jurisdiction.</p> <p>Pursue additional opportunities for joint management of fire suppression, prescribed fire, and habitat manipulation.</p> <p>Explore land exchange opportunities as they become available (e.g., State, BLM, private, nongovernmental organizations).</p> <p>Look for additional partnerships and money for increased invasive species control.</p> <p>Work with these and other partners to highlight refuge resources through promotional materials.</p>

