

# 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 final plan. Chapter 1 contains descriptions of the issues.



*Service staff present the management alternatives to the public.*

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## 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 dropped, and those are discussed later in section 3.10. 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 (preferred alternative)

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. Specific elements common to all alternatives follow:

- Significant cultural and paleontological resources will be protected and managed. Individual projects may require more consultation with the State of Montana's Historic Preservation Office, Tribal Historic Preservation Offices, and other interested parties.
- Several special regulations for public access on the refuge will continue to apply. Many of these are identified at the beginning of the public use—access discussion in section 3.8. This includes, among others, the requirement for all-terrain vehicles (ATVs) and motorcycles to be street-legal. In addition, all vehicles must stay on established routes. The Service will continue to allow for access to private inholdings or State lands.

Although the amount or type of access varies by alternative, the Service will develop a stepdown management plan for transportation based on the alternative selected for the final CCP.

- Landing sites for seaplanes will continue to be allowed under the provisions of the Seaplane Landing Plan (USACE 1995). Aircraft may not land on the uplands of the refuge. Landing and taxiing of fixed-wing aircraft on the surface of Fort Peck Reservoir is allowed in designated landing locations.
- 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 2008c).
- All wildfire suppression and prescribed fire activities will be carried out under an approved fire management plan. Any prescribed burns will be carried out in conformance with an approved smoke management plan that addresses critical smoke concerns, measures to reduce negative effects, downwind receptors, and smoke-vector maps in individual burn plans. The Service will acquire an outdoor burning permit issued by the Montana Department of Environmental Quality. The use of prescribed fire will follow protocol and guidelines established in the Montana/Idaho Airshed Operating guide (MIAG 2010). The Service will obtain clearance from the Montana/Idaho Airshed Group before any use of prescribed fire.
- 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 will aggressively suppress all wildfires that occur on State school-section lands within the boundary of the refuge. The Service will 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 ground water.
- The Service will carry out all refuge management activities for water development in accordance with the final outcome as determined by the Montana Reserved Water Rights Compact Commission (refer to chapter 4, under "4.2 Physical Environment," "Water Resources").
- Several refuge permittees have grazing permits that include Service lands, BLM, and DNRC lands. The implementation of prescriptive grazing on Service lands may negatively affect the ability of permittees to continue to graze DNRC lands within the refuge boundary. It is not the intent of the Service to negatively affect 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 keep their permits, the Service will work within current budget constraints to obtain leases that benefit refuge management activities.
- The Service will look to facilitate the exchange of State lands within the refuge boundary where feasible.
- The Service will work with willing sellers as money is available to buy priority lands within the authorized boundary.
- The Service will cooperate with USACE to transfer jurisdiction of lands not needed by USACE to meet its legal mandates.
- The Service will adhere to legal obligations for any valid rights-of-way for access to private and State lands.
- Boating will continue to be allowed on the refuge. Special regulations apply along the western end, which is part of the National Wild and Scenic River System.
- The Service will cooperate with partners to provide comparable accessible opportunities for all.
- The Service will continue to prohibit shed hunting.
- The Service will continue to protect all areas with special land designations: wilderness, proposed wilderness, recommended wilderness, the Lewis and Clark National Historic Trail, the Hell Creek and Bug Creek Fossil Areas, the research natural areas, and the Upper Missouri River Breaks Wild and Scenic River.

- In any actions involving the taking of wildlife on the refuge for predator control by U.S. Department of Agriculture (Wildlife Services), the Service will decide whether the activity is appropriate (603 FW 1), and, if so, whether it is compatible with the purposes of the refuge and the Refuge System.

### 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, which the Service developed to achieve the refuge vision and goals and to address 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 preferred alternative. 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. Table 10 in section 3.15 is a summary of the actions for each alternative. Table 56 in chapter 5, section 5.16, 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 plant species throughout the refuge.

**Livestock Grazing.** Livestock would be kept out of most riparian areas primarily through fencing. The Service would gradually implement prescriptive grazing across the refuge as required by Service policy. This would occur as habitat evaluations are completed or following the sale of a ranch to a third party. By the end of 15 years, about 50 percent or more of the units would have been converted to a prescriptive component (see section 3.8, “Habitat—Upland,” for a full definition and description).

**Wildland Fire.** The current fire management strategies would be maintained. Wildfires would be suppressed with no benefit obtained. Prescribed fire would continue to be minimally used as a management tool.

**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 small 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: 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 opportunities in accordance with the compatibility determination (appendix C) and MFWP regulations.

### **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: ATV use on public roads providing they are licensed, bicycling 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 complete the study of all units that meet the wilderness criteria (see appendix E) and submit final recommendations to the Service directorate and Secretary of the Department of the Interior.

*Figure 7 follows  
(two foldout pages)*

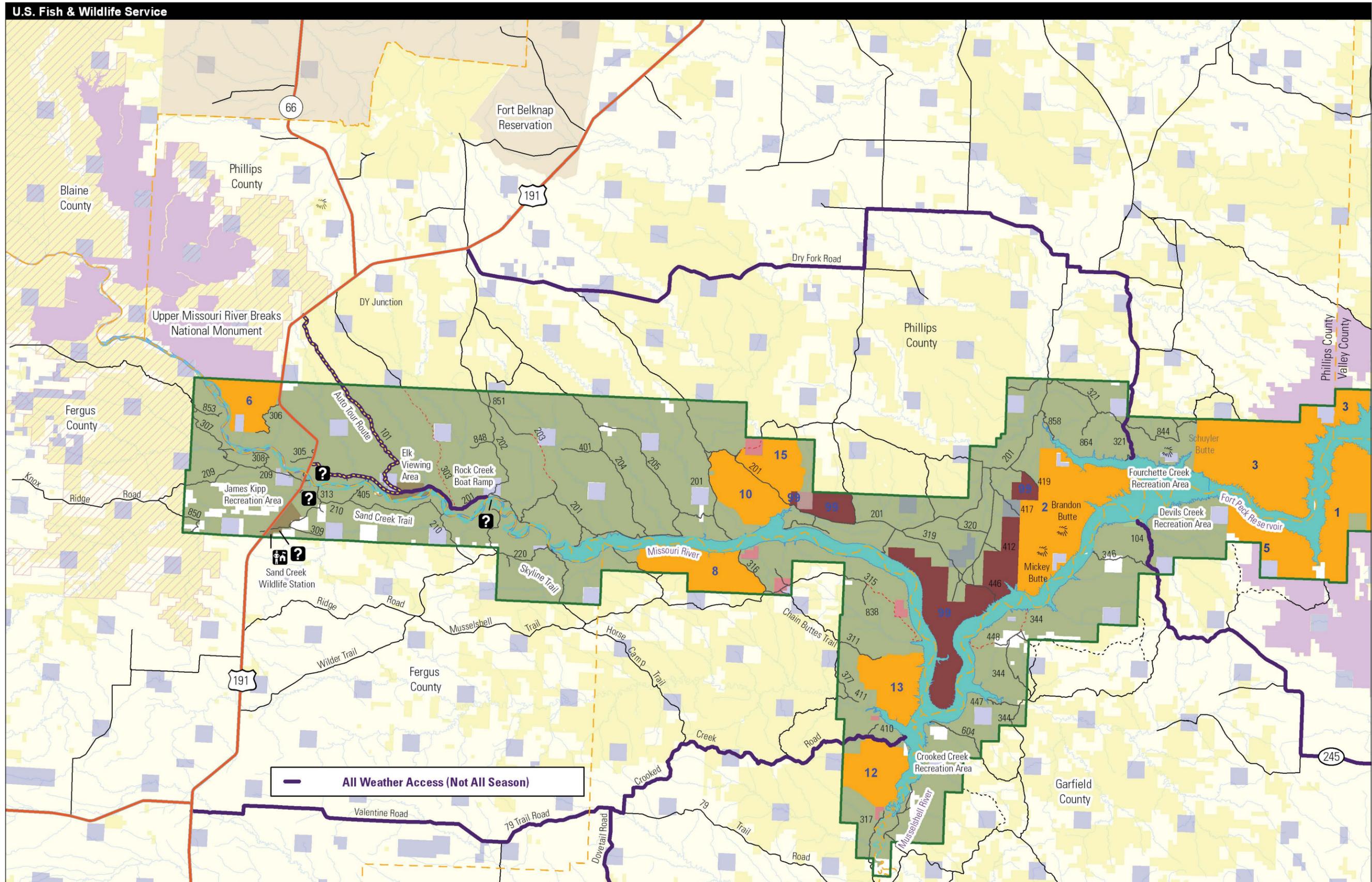


Figure 7. Map of management under CCP alternative A for the Charles M. Russell and UL Bend Refuges.

Figure 7 (alternative A, west)





## 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 kept at current levels.

**Equipment and Facilities.** Equipment and facilities would be maintained at current levels. (Same as alternative B.)

**Minerals.** The mineral withdrawals for locatable minerals (diatreme gems) on the UL Bend Refuge (permanent) and the Charles M. Russell Refuge (20-year withdrawal) would remain in effect.

### 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 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 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 or focal 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 or focal species. The Service would work with others to develop methods to monitor and evaluate target species and habitat needs. (Refer to section 3.8 for descriptions of focal, target, and sentinel species.)

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 pri-

orities. 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.

**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 (refer to section 3.8, “Habitat,” for a full definition and description). Within 4–7 years, prescriptive livestock grazing would be carried out on 50–75 percent of the refuge, and this progression would be continued over 15 years. 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 enclosures 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 found appropriate and compatible with habitat management objectives.

**Wildland Fire.** 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 outfitters 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 includ-

ing 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 alternatives 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 ground waterflow into streams and to reduce runoff and soil erosion, thus protecting riparian area corridors.

The Service would acquire water rights associated with buying 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.

*Figure 8 follows  
(two foldout pages)*

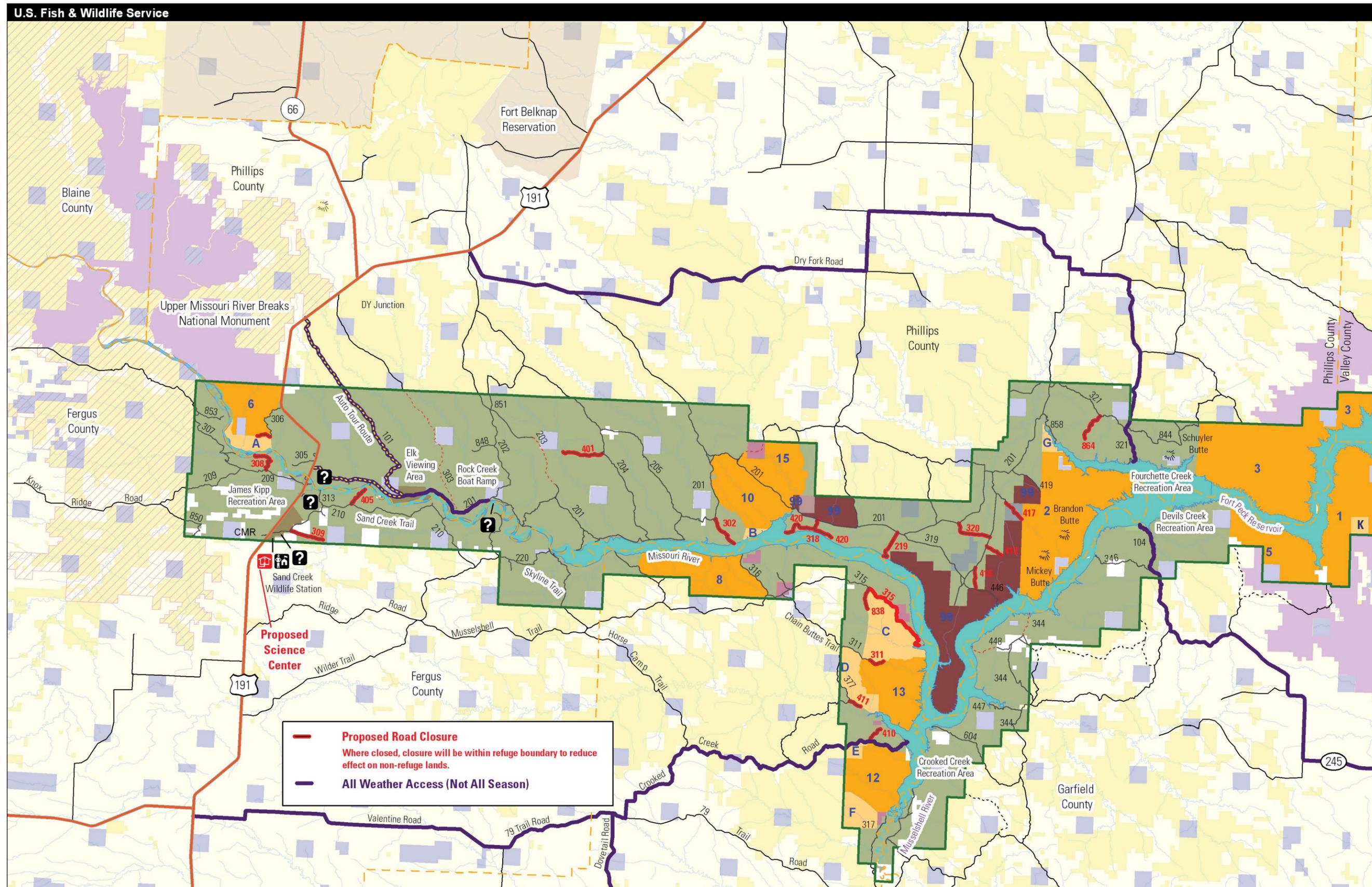


Figure 8. Map of management under CCP alternative B for the Charles M. Russell and UL Bend Refuges.

Figure 8 (alternative B, west)

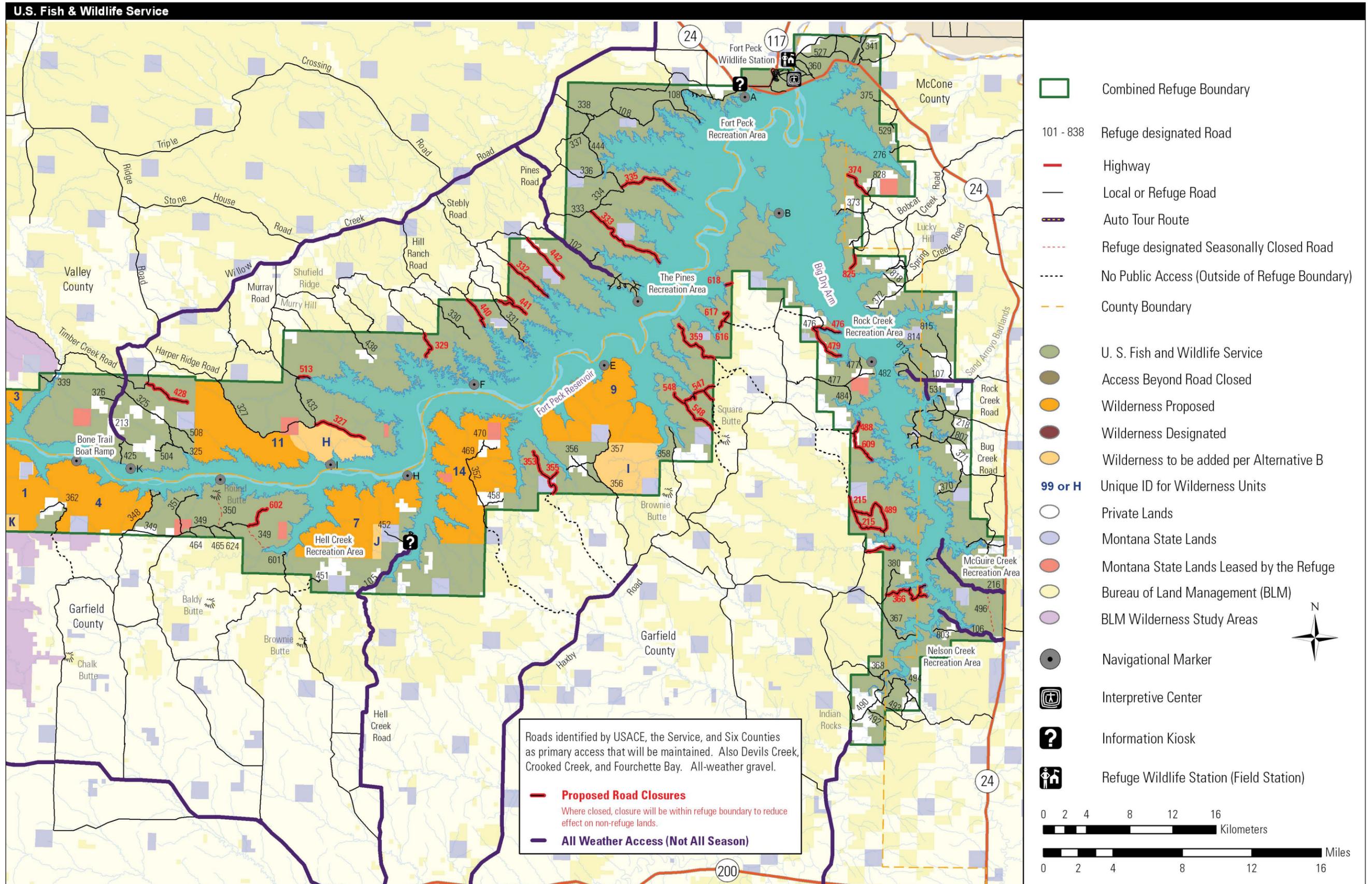


Figure 8 (alternative B, east)



**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 grizzly bear, in accordance with Federal and State regulations and plans to address potential immigration of this species to the refuge. With approved MFWP management plans and in cooperation with MFWP and others, the Service would consider reintroduction of more 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 stopped.

## **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 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 sustainable populations of game and nongame fish.

### **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 more partners to expand interpretive and educational opportunities and update the signage, Web site, 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. ATV 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 allowed. 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. More 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 make recommendations to expand or adjust existing proposed wilderness units by 25,869 acres in Alkali Creek, Antelope Creek, Crooked Creek, East Seven Blackfoot, Mickey Butte, Sheep Creek, Wagon Coulee, West Beauchamp Creek, and West Hell Creek to conserve and promote their wilderness qualities and characteristics. These expansions or adjustments are called wilderness study areas (see figure 8 and appendix E).

## 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 stepdown 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 carry out 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 alternative D.)

### Paleontological Resources

For paleontological resources, elements would be similar to alternative A, except the refuge would develop a stepdown 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 refuge operations and the refuge's collaboration with many partners.

### Refuge Operations

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

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

**Equipment and Facilities.** Same as alternative A.

**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 the 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 more partnerships and money 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.

(Same as alternative C.)

## 3.6 SUMMARY of ALTERNATIVE C (Public Use and Economic Use Emphasis)

The Service would manage the landscape, in cooperation with 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.

*Figure 9 follows  
(two foldout pages)*

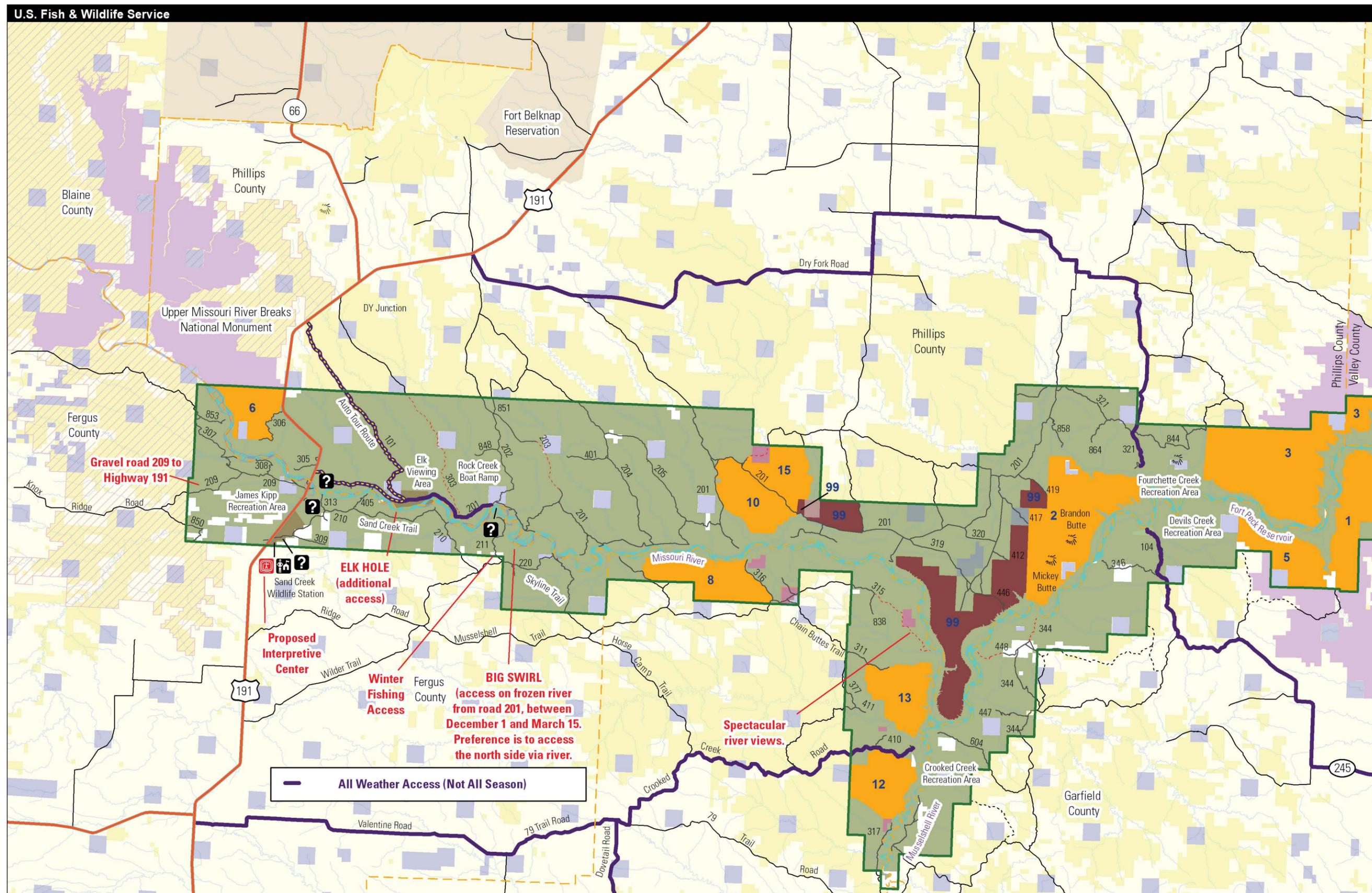


Figure 9. Map of management under CCP alternative C for the Charles M. Russell and UL Bend Refuges.

Figure 9 (alternative C, west)

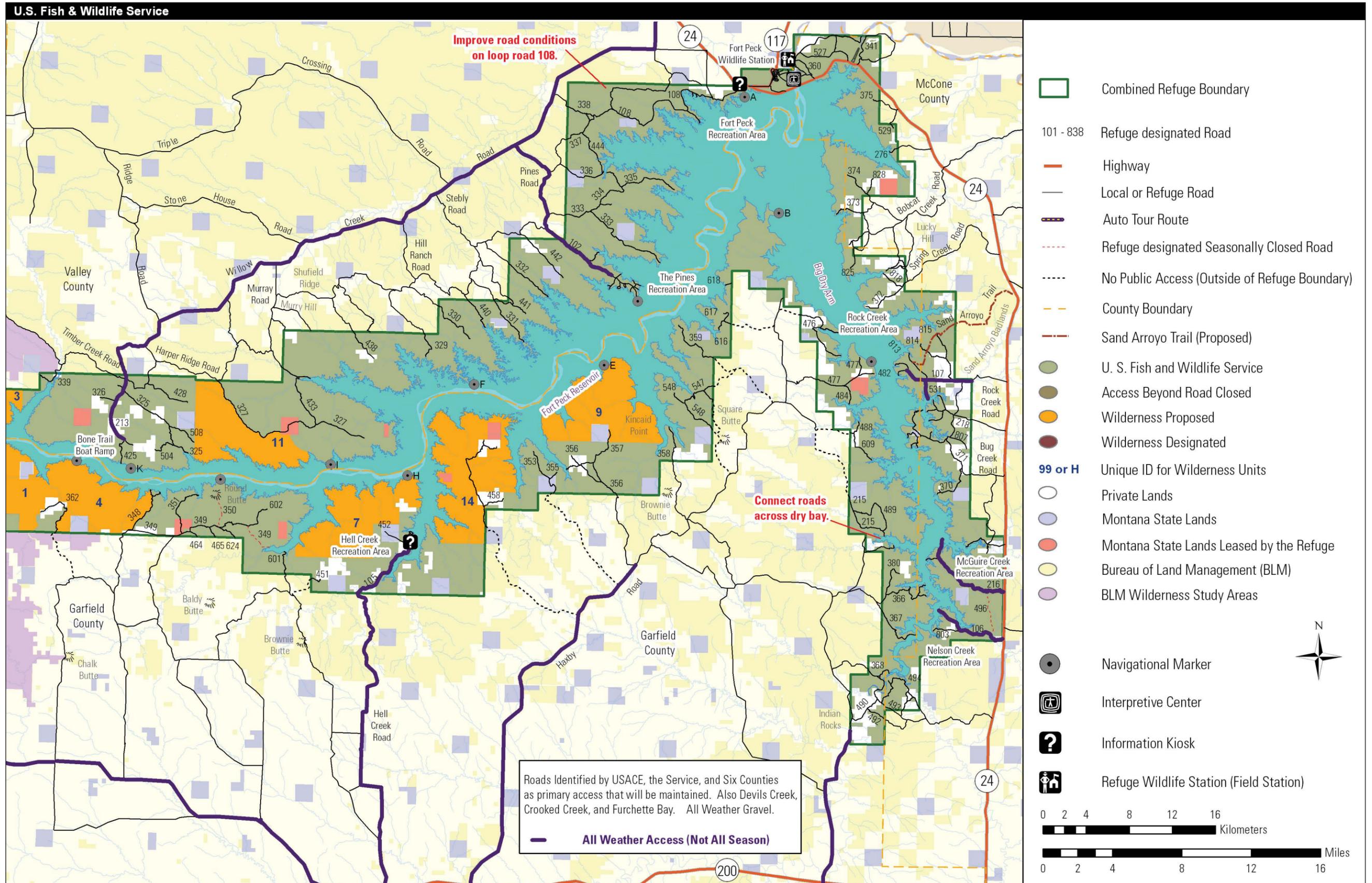


Figure 9 (alternative C, east)



**Livestock Grazing.** The Service would gradually move to a prescriptive livestock-grazing program when current grazing permits become available due to ranches changing ownership (this would not include generational transfer; refer to section 3.8, “Habitat,” for a full definition and description). 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.

**Wildland Fire.** 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. Wildland fire would be used as a mechanism for natural succession in habitat units. To minimize the fuel load, more 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 alternatives 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.

## Wildlife

Through collaboration with MFWP and others, the Service would keep 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 grizzly bear management plan would be developed in accordance with Federal and State regulations and plans to address potential immigration of this 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 fishing in the winter. More fishing opportunities would be created by stocking 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 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). While virtual geocaching would be allowed, physical geocaching would not be allowed on refuge lands.

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**

Wilderness would be managed similar to alternative A. The Service would not make recommendations to expand wilderness protection in any units on the refuge.

## **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 buying inholdings for protection.

## **REFUGE OPERATIONS and PARTNERSHIPS**

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

### **Refuge Operations**

The refuge relies on personnel, equipment, and facilities to carry out both day-to-day operations and 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 alternative 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.

**Minerals.** Same as alternative B.

### **Partnerships and Collaboration**

Same as alternative B.

## 3.7 SUMMARY of ALTERNATIVE D (Ecological Processes Emphasis, Preferred Alternative)

In cooperation with 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. The emphasis on ecological, or natural, processes recognizes the importance of fire, grazing by ungulates, hydrology, temperature, nutrients, and soil compaction in shaping and sustaining diverse, healthy habitats on the refuge. Initially, this would include a concerted

manipulation of habitats or wildlife 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 money.

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 twofold: (1) ensure viable populations of sentinel plant species (species that decline first when management practices are injurious); and (2) ensure the viability of focal bird species (species that are representative of a broader group of species that share similar conservation needs).

**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, the Service would implement prescriptive grazing across most of the refuge (50–75 percent within 6–9 years and continue the progression over 15 years). In sensitive areas like river bottoms, fencing would be used to exclude livestock except at designated water gaps (areas where livestock can access water); refer to section 3.8, “Habitat,” for a full definition and description.

**Wildland Fire.** 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 and associated plant species, (3) enhances food resources for wildlife, (4) ensures biological diversity and integrity and environmental health, and (5) promotes ecological resilience. Fur-



*Redosier Dogwood*

thermore, 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 alternatives 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 area 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 shows that 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 stopped, 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 collaboratively 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. Quality experiences are based on criteria defined in the Service's policy for wildlife-dependent recreation (FWS 2006c):

- promotion of safety
- compliance with laws
- minimizing conflicts with other policies or adjacent landowners
- promotion of accessibility and availability to a broad spectrum of visitors
- promotion of resources stewardship and conservation

*Figure 10 follows  
(two foldout pages)*

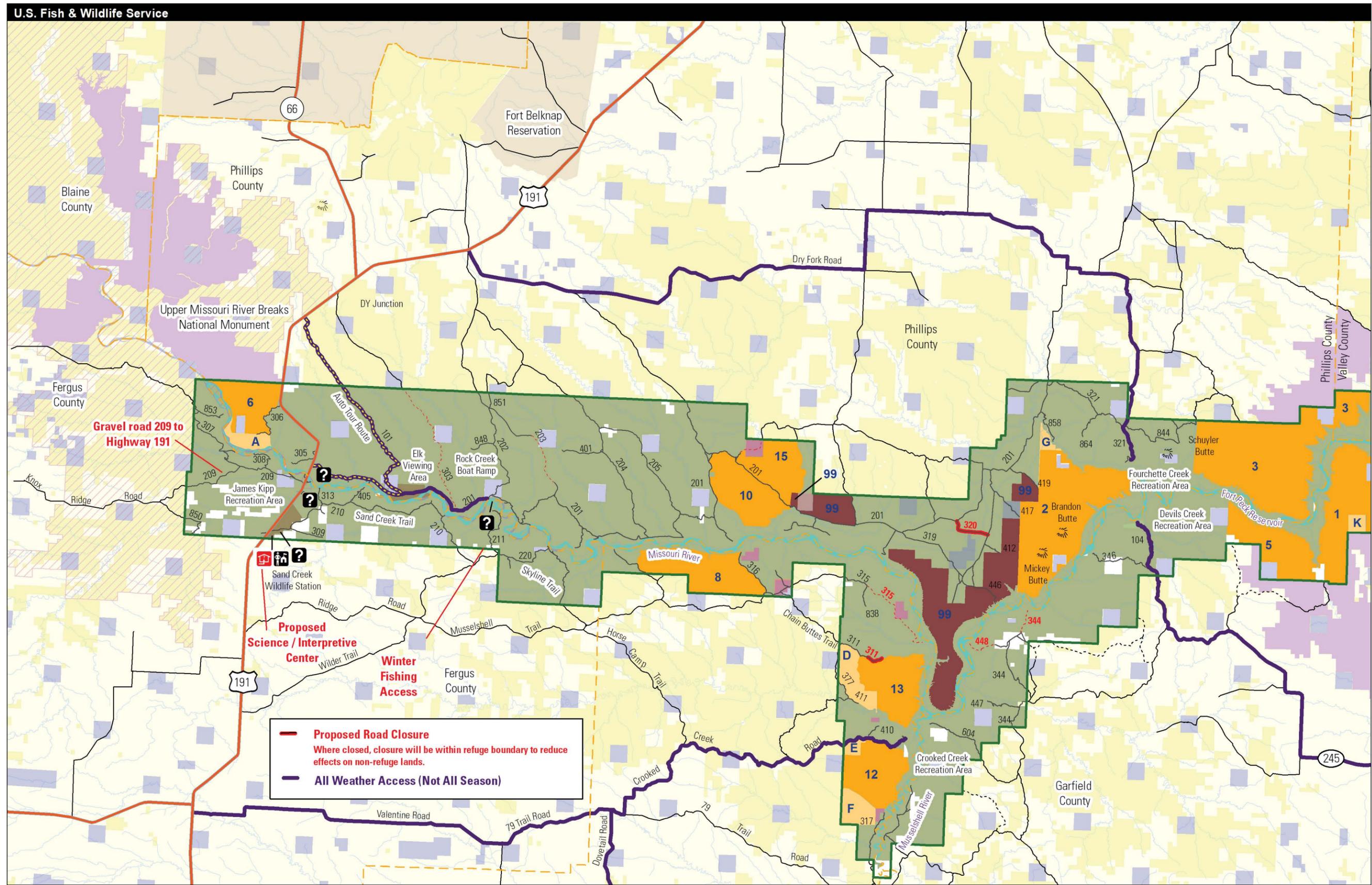


Figure 10. Map of management under CCP alternative D for the Charles M. Russell and UL Bend Refuges.

Figure 10 (alternative D, west)

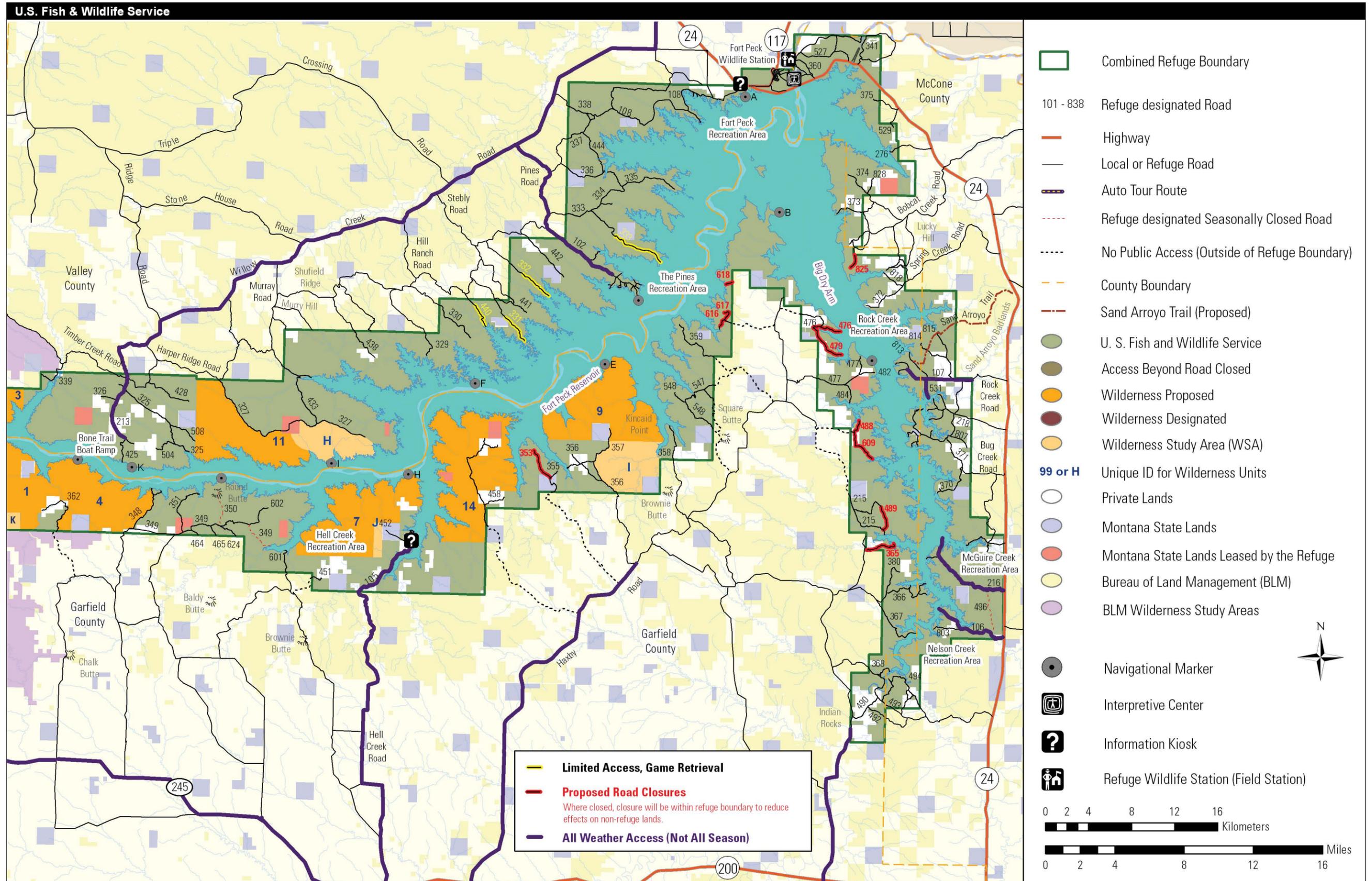


Figure 10 (alternative D, east)



- provision of reliable and reasonable opportunities to experience wildlife
- provision of facilities that are accessible and blend into the natural setting

### **Hunting**

Pursuant to Service policies and Federal laws and regulations, 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 primarily managed to benefit natural processes, but some improvements would be made to provide quality visitor experiences. Initially, the Service would close about 21 miles of roads, implement a seasonal closure along 2.4 miles of road 315, and designate 13 miles of roads on the northeast side of the refuge as game retrieval roads where seasonal closures would be applied. Other closures or modifications could be necessary after further review of the refuge's road program. This would encourage free movement of wildlife, permit prescribed fire or wildfire suppression activities, and increase effective harvest of wild ungulates. The Service would upgrade about 5 miles of roads to all-weather access (gravel), allow more winter fishing access, and expand opportunities for quality wildlife observation, interpretation, and environmental education through added facilities (trails, viewing blinds, and a science interpretive center).

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 to 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 educational and recreational 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, and adaptive management (refer to figure 11) 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 expand or adjust the existing proposed wilderness units by 19,942 acres in Alkali Creek, Antelope Creek, Crooked Creek, East Seven Blackfoot, Mickey Butte, Wagon Coulee, Sheep Creek, and West Hell Creek to promote and conserve wilderness qualities and characteristics and minimize negative effects on existing access. These expansions or adjustments are called wilderness study areas (see figure 10 and appendix E).

## **CULTURAL and PALEONTOLOGICAL RESOURCES**

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

### **Cultural Resources**

Same as alternative B.

### **Paleontological Resources**

Similar to alternative 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 alternative 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.

**Minerals.** Same as alternative 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.

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## 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 objec-

tive or strategy is similar or the same as for another alternative, this has been noted and for conciseness it is generally not repeated.

## ORGANIZATION of the OBJECTIVES and STRATEGIES

The goals are intricately linked in managing habitat, wildlife, and water resources; therefore, the objectives for all these goals are grouped in this section under two topics, habitat and wildlife.

The habitat objectives are split into four vegetation categories: upland, river bottom, riparian area and wetland, and shoreline. There are other 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: birds, threatened and endangered species and species of concern, furbearers and small predators, American bison, gray wolf, big game (elk, deer, pronghorn, Rocky Mountain bighorn sheep, and mountain lion), and other wildlife (invertebrates, amphibians, reptiles, fish, and small mammals). Although wild American bison and gray wolf are not currently found on the refuge, they are discussed.

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, black-tailed prairie dog, greater sage-grouse, mountain plover, burrowing owl, sicklefin chub, and sturgeon chub.

## FOCAL, TARGET, and SENTINEL SPECIES

It is important to understand the designations for species the Service has identified for management and monitoring in the plan, as detailed in the objectives and strategies.

- A *focal bird species* is representative of a broader group of species that share similar conservation needs. It may have restrictive habitat needs or be more sensitive to or limited by certain ecological processes or management activities such as fire or grazing. For example, an area that supports Sprague's pipit would also support western meadowlark, but an area that supports western meadowlark would not necessarily support Sprague's pipit (Lambeck 1997). The Service identified 13 focal bird species for habitats on the refuge: uplands (6 species), river bottoms (3 species), and riparian areas and wetlands (4 species).

- A *target wildlife species* is one the Service chose to manage for specific biological or social reasons. A target species could be a focal, endangered, big game, or other species. Establishing a huntable bighorn sheep population east of Timber Creek is an example of a species being targeted for a specific area.
- A *sentinel plant species* is one that vanishes first when ecological processes are out of balance.

The Service identified 23 sentinel plant species to monitor as indicators of refuge habitat conditions. An important limiting component for many wildlife species is the availability of quality foods (White 1978); for example, the sentinel Maximilian sunflower provides valuable wildlife forage, fruit, and pollen-producing food plants and is desired by both wildlife and livestock.



USFWS

Refuge staff monitor plants on the refuge.

## OBJECTIVES for HABITAT and WILDLIFE

### HABITAT—UPLAND

Each species of wildlife that uses the uplands has unique habitat needs. Their needs 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.

Prescriptive livestock grazing, as described below, is one of the strategies the Service uses, where appropriate, to achieve upland habitat objectives.

### *What is Prescriptive Livestock Grazing on the Refuge?*

Prescriptive livestock grazing is the planned application of livestock grazing at a specified season, duration, and intensity to achieve specific vegetation objectives. The objectives are designed to meet the broader habitat and wildlife goals. Rather than managing refuge resources to support livestock grazing or other economic uses, livestock grazing is used as a habitat management tool to achieve the goals and objectives for wildlife habitat (FWS 2001).

The Service has been gradually making the transition to prescribed livestock grazing for more than 20 years as a result of the 1986 record of decision on an earlier EIS (FWS 1986) and Service policies that resulted from passage of the Improvement Act—compatibility (FWS 2000a) and biological integrity (FWS 2001). Current prescribed grazing is applied on about 34 percent of the refuge. In practice, these current grazing prescriptions range from variable livestock timing and distribution to long-term rest or permanent exclusion.

Future prescriptive grazing regimens could include short-duration, high-intensity grazing treatments to control invasive plants (FWS 2011b); habitat management for specific wildlife or focal bird species; or multiple-unit rotational systems to provide long-term rest between grazing treatments. These and other prescriptions such as pyric herbivory will be considered for achieving habitat objectives and developing a mosaic of desired habitat conditions that support a variety of wildlife species.

Each alternative would continue the transition to prescribed grazing across the refuge. The Service will identify habitat-based objectives to support the life requirements of wildlife species and, where applicable, use grazing as a tool to achieve the required vegetation structure and composition.

The Service will communicate with existing and future grazing permittees as habitat management plans are developed. This will help permittees to plan and adapt their operations at the same time the Service is applying prescriptive grazing as a management tool to meet habitat and vegetation objectives.

*Chapter 1, section 1.2, has more information on the Service's biological integrity policy. Chapter 4, section 4.3, describes the history of livestock grazing on the refuge and upland vegetation monitoring.*

### 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 accord-

ing 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 7,700 acres by 2028.

**Upland A3.** By 2013, plant shrubs on about 100 acres and on 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 shows that deciduous shrub species are declining in both in abundance and vigor on the refuge (see chapter 4, section 4.3), 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.

The specified number of AUMs is based on what would have been permitted 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 showed 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 found that light grazing (0- to 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 ended.

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 habitat and wildlife resources.

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

About 34 percent of the refuge is now considered to be managed prescriptively (see figure 16 in chapter 4). Based on the rate of change since 1990 when habitat management plans were initially completed, it is estimated that, within 15 years, 50 percent or more of the refuge’s habitat units would be managed prescriptively.

**Strategies for Upland A1–A4** Many of these strategies are the tools selected in the record of decision from the 1986 EIS.

- By 2013, fence at least one habitat unit. Fence other parts of the boundary if problems arise with unauthorized livestock use. Construct only a limited amount of interior fencing.
- Over 15 years, continue a gradual move toward prescriptive grazing (on 50 percent or more of the refuge). 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. (Refer to the prescriptive grazing text box for a definition and description.)
- Over 15 years, use grazing at current levels to keep existing plant communities at desired habitat conditions at light livestock grazing levels.
- Over 15 years, conduct a monitoring program to figure out if more changes in grazing would need to be made on specific areas not responding to upland management.

- Construct fences where necessary to achieve agency objectives, with locations to be decided after consultation among the concerned parties from when HMPs were written.
- Construct fences in the best and most practical locations.
- Construct boundary fence to be 42 inches high and three-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 (Paige 2008).
- Potentially locate new water facilities or apply 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 show 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.
- End 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 wildlife species or focal bird 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 wildlife species or focal bird species (refer to bird objectives, which follow habitat objectives, for a description of focal bird species). Where needed, using artificial food resources would be provided to promote wildlife populations. Refer to the prescriptive grazing explanation in the introduction for "Habitat—Upland" objectives.

**Upland B1.** Within 3 years, develop new HMPs for target or focal bird species (primarily elk, pronghorn, and sharp-tailed grouse) that are defined in Olaus Murie's 1935 biological assessment (refer to chapter 4). Base HMPs on habitat units that are ecologically similar. Develop specific habitat evaluation and management plans for each sentinel and target species or focal bird species.

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

**Upland B3.** 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 (to achieve 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 B4.** 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 B5.** Over 15 years, maintain existing densities or populations of fire-intolerant big sagebrush on fire refugia to support sage-dependent species in each of the habitat units to restore shrub diversity in the shrub-steppe uplands.

**Rationale for Upland B1–B5.** 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 grama 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 assess-



Dave Menke / USFWS

*Upland habitat is important to the lazuli bunting.*

ment would be used to inform the basis for the target wildlife species or focal bird species 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; the transition would occur within 4–7 years of plan implementation. 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 money and resources allowed, 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 needs (food, water, and cover) for each target or focal 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 needs (food, cover, and water) of each target species.

Wildlife population surveys and habitat surveys would show improving or worsening conditions for focal 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 focal 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 plant species (refer to appendix F) are early warning indicators for ecosystems—they are the first species to decline or vanish in ecological systems when evolutionary natural processes such as herbivory, predation, and fire change. The Service has been monitoring the health of these important plant species on the refuge since 2003 and has found that some are beginning to diminish due to the changes to natural processes that have occurred. Different species of sentinel plants are adapted to all the temperature, moisture, and physical gradients present on the refuge and are more sensitive to changes in management or environmental conditions than general plant communities.

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. Refer to the rationale under alternative D for more discussion about sentinel plants.

**Strategies for Upland B1–B5**

- 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.
- Over 15 years, fence 50–75 percent of the unfenced refuge boundary or the boundary established with wildlife conservation partners.
- 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.
- Within 2 years, determine the habitat needs and current conditions for focal 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 conduct 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, carry out 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 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 shows a declining population, take the following actions: (1) stop prescriptive livestock

- grazing in the unit; and (2) cooperate with MFWP to manage elk, deer, and bighorn sheep to meet objectives in MFWP’s management plans for the Missouri River Breaks. Where monitoring shows habitat conditions and sentinel plants are stable, 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. Possibly 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. Because it is possible that prescriptive grazing practices on Service lands may negatively affect current permittees that graze BLM, DNRC, and other Service lands, work with DNRC as budgets allow to mitigate any loss of revenue by assuming leases on these pastures. (Same as 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 habitat 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 NRCS. Within HMPs, include fencing for better livestock distribution, water development, prescriptive grazing, and other management techniques designed to improve habitat condition. (Refer to the prescriptive grazing explanation in the introduction for “Habitat—Upland” objectives.)

**Upland C2.** Within 3–6 years, in cooperation with NRCS, conduct ecological site evaluations on habitat units with boundary fences that permit control over livestock numbers and management. Continue cur-

rent HDP surveys and conduct surveys in 50 percent of the areas currently absent of livestock to measure residual cover.

**Upland C3.** 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 C4.** 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 effectively (no common pastures, and large enough refuge acreage). 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). Adhere to the Service's information quality guidelines and peer review of scientific information (FWS 2011a). (Same as Upland D3.)

**Upland C5.** 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 C6.** 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 D4.)

**Upland C7.** Over 15 years, increase both the population viability and a 1- to 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 C8.** 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 D6.)

**Upland C9.** Over 15 years, increase both the population viability and a 1- to 5-percent increase in cov-

erage 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–C9.** Alternative C would keep 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 (no livestock), they may be combined with other vacant or permitted units to carry out 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 kept 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–C9**

- Over 15 years, carry out 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.
- 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 conduct 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, carry out a prescriptive grazing program on about 50 percent or more of the habitat units by continuing the practice of holding grazing permits as ranches sell their lands to outside parties.

- 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 shows a declining population, cooperate with MFWP to manage deer, elk, and bighorn sheep to meet the objectives in 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 address 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 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 the 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. Coordinate the construction of boundary fences to facilitate a move to a prescriptive grazing program with BLM, DNRC, and local ranches.
- Hire seasonal employees for fence removal and professional fence builders for boundary fence construction of remaining fences, which 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. Because it is possible that prescriptive grazing practices on Service lands may negatively affect current permittees that graze BLM, DNRC, and Service lands, work with DNRC as budgets allow to miti-

gate any loss of revenue by assuming leases on these pastures. (Same as B and D.)

### **Objectives for Upland Habitat, Alternative D**

The Service would promote ecological resilience, restore the pyric herbivory, promote animal movement with long periods of abandonment to reduce plant species selectivity, and increase landscape species and structural heterogeneity, and improve wildlife diversity. The objectives also address the goals identified in the Service's Climate Change Strategic Plan (FWS 2010c). Although the upland habitat objectives are intended to improve conditions for a broad range of resident and migratory wildlife species that use the refuge, the objectives would complement the Service's efforts toward bird conservation and protecting and enhancing threatened and endangered species and species of concern (refer to chapter 1, section 1.4). The Service has identified six focal bird species for monitoring the health of uplands: long-billed curlew, Sprague's pipit, Baird's sparrow, brown creeper, sharp-tailed grouse, and greater sage-grouse (refer to the objectives for birds that follow the habitat section and section 4.3 in chapter 4).

**Upland D1.** Within 5 years, develop new HMPs including inventory and monitoring plans based on soil characteristics, historical fire occurrence, and hunting district boundaries. Include effective implementation of new management strategies (prescriptive pyric herbivory, prescribed fire and wildfire return, and sentinel plant monitoring and enhancement) that achieve desired habitat conditions and restore ecological resilience. (Refer to Upland D7 and its rationale for a definition of success. Refer to the prescriptive grazing explanation in the introduction for "Habitat—Upland" objectives.)

**Upland D2.** Within 6–9 years, consolidate the 65 habitat units into 3–8 units for restoration of the 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.** Same as Upland C4.

**Upland D4.** Same as Upland C6.

**Upland D5.** Over 15 years, increase both the population viability and a 10- to 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. (See the end of Upland D7 for criteria for successful implementation.)

**Upland D6.** Same as Upland C8.

**Upland D7.** Over 15 years, increase both the population viability and 10- to 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, promote the ecological resilience of highly palatable, summer-growing forbs, and enhance the required habitat of the focal bird species identified in the bird objectives.

**Successful implementation of Upland D5–D7 objectives would be defined as follows:**

- Fifty percent of populations of winterfat, salt-bush, grey rubber rabbitbrush, and other fire-adapted sentinel shrub species are able to reach their height and fruit-bearing potential and successfully recruit young plants into the populations 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 are able to reach their height and fruit-bearing potential and successfully recruit young plants into the populations in coulees and riparian areas.
- Populations of purple prairieclover, white prairieclover, dotted gayfeather, purple coneflower, stiff sunflower, Maximilian sunflower, and other sentinel forb species increase in coverage on remnant sites by approximately 10 percent over 15 years.
- Fire-intolerant species are maintained in areas that did not burn or where there is a low fire-return interval.
- Habitat is enhanced to meet the needs of focal bird species (refer to bird objectives below).

**Rationale for Upland D1–D7.** 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). Additionally, using the concepts of resilience management (Resilience Alliance 2007), 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.

The concept of sentinel species monitoring is not new. In 1947, Aldo Leopold discussed diagnostic plant species that were early to respond to ungulate

grazing pressure (Leopold et al. 1947). More recently, focal species are understood to be the individual wildlife species that have the most stringent limitations for area, dispersal, or resources or are limited by ecological processes (Lambeck 1997). While animal species are clearly the best indicators of habitat area and dispersal needs, plant species (as suggested by Landsberg and Crowley, 2004) are important indicators of habitat quality and the ecological processes that sustain it. An important limiting component for many, if not most, animals is the availability of quality foods (White 1978). Even generalist herbivores prefer the highest quality plants (Myserud 2006), which are the first to decline or disappear. Sentinel plant species include the most valuable wildlife forage, fruit, and pollen-producing food plants. Sentinel species are also important indicators for monitoring biological diversity (Cousins and Lindborg 2004, Cushman et al. 2008, Gibson and Bosch 1996, Noss 1990, Rogers and Biggs 1999, Simberoff 1998), which are a critical component of wildlife conservation and a defining purpose of the Refuge System. Monitoring for sentinel plants is a key measure of success or failure of the Service’s desire to promote ecological resilience by managing for natural and diverse processes.

Resilience is the ability to absorb disturbances, to be changed, and then to reorganize and still have the same identity, that is, keep 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 2007).

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 (2007).



Jeff McMillan / USDA-NRCS PLANTS Database

*Maximilian Sunflower*

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 that shaped this landscape during the past 6,000 years (Higgins et al. 1986). Total ungulate effects and fire effects on plant communities would be measured with sentinel species. More discussion on sentinel plants is in chapter 4, section 4.3. A list of the 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 remove fences. Much of the fencing work that remains is in rugged terrain, and the work would need to be prioritized. As money and resources allowed, the refuge would continue to convert to prescriptive grazing over 15 years.

Since the demise of the wild bison in 1881 (FWS 2010d), the fire-return interval has lengthened on the refuge, and the fires that do occur are often more intense than commonly happened historically (Frost 1998). Figure 18 in chapter 4 shows the fire frequency intervals found on the refuge. This map would continue to be checked and updated for accuracy, but it currently provides a good representation of fire frequency. 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 saltbush, 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 focal 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 (Green et al. 2002) and Sprague's pipit (Robbins et al. 1999, FWS 2010e). Also affected are species that require a wide diversity of vegetation structure, plant species, and insect species within their home ranges such as sharp-tailed grouse and greater sage-grouse. There are similar concerns for some small mammals, invertebrates, and other wildlife groups. See the bird objectives below for more literature about focal birds.

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. However, the Service would protect sagebrush areas that are important for greater sage-grouse (refer to prescribed fire objectives below).

Inventory and monitoring procedures would focus on sentinel plant species and focal bird 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). Tie habitat monitoring to focal bird species monitoring (for more information, refer to bird objectives below; chapter 4, section 4.3; and appendix F).
- Continue to work with range ecologists and use current monitoring results, along with newly acquired information, to develop adaptive management strategies. Make sure monitoring protocols meet Service information quality guidelines (FWS 2011a).
- 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 NRCS, reestablish populations of sentinel plant species on 50 percent of the sites where they have been eliminated.
- Evaluate important habitat areas for focal bird species where fire would be detrimental and protect those areas (refer to prescribed fire objectives in the next section).
- 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 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.
- Within 6–9 years, implement prescriptive grazing and pyric herbivory across 50–75 percent of the refuge to restore the resilience and stability of ecosystems on 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 (refer to the prescriptive

grazing explanation in the introduction for “Habitat—Upland” objectives). Because it is possible that prescriptive grazing practices on Service lands may negatively affect 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 as C and D).

- Coordinate the construction of boundary fences to facilitate moving to prescriptive grazing with BLM, DNRC, and local ranches. Communicate with permittees as HMPs are developed so they can make plan and adjust their operations for future grazing needs.

## 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. Two river bottoms are undergoing restoration, and the other 15 areas have about 4,500–6,000 acres that need the removal of invasive plants (refer to figure 20 in chapter 4). The plant communities left on the river bottoms have now mostly been invaded by Russian knapweed, leafy spurge, smooth brome, and quackgrass, which have very little value to wildlife.

Restoration of the river bottoms would consist of a healthy native plant community including those 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 bottomlands in 2005 and an additional 160-acre project began 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 promote resilience and resist invasive species invasions in the future.

### Strategies for River Bottom A1

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

### Objectives for River Bottom Habitat, Alternative B

Similar to upland objectives for alternative B, three bird species, all migratory birds, were selected as focal species for monitoring the health of river corridors: red-eyed vireo, Brewer’s blackbird, and veery. For more information about the objectives for these species, refer to the bird objectives for alternatives B and D below; chapter 4, section 4.3; and appendix F.

**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, which address equipment needs, grants, partnerships, and a farming plan and 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.** An aggressive approach toward removing invasive plants would be taken. Work would include burning, discrete spraying with herbicides and planting 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 encroach again. A short-term grazing application could be nec-

essary in areas where herbicides cannot be used or where it would be beneficial to control invasive species (FWS 2011b). 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, allow 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 unless a short-term grazing application is needed to control invasive species.
- 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 money to acquire equipment and supplies as needed.
- Hire a grant writer to pursue more funding avenues to secure money for weed removal projects.
- Clean former river bottoms through the application of herbicides and farming. If money 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 from 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. Follow with native plantings 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.** Within 4–6 years, 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 (use Roundup® initially to treat an area before planting).

**River Bottom C2.** Over 15 years, complete 50–60 percent of the identified projects for invasive plant removal (to restore these areas 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.** The Service would rely on partnerships with cooperative farmers to restore the river bottoms. The use of cooperative farmers with the necessary equipment and knowledge would allow the Service to treat more areas in less time and with fewer refuge resources. 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 nongenetically 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. Short-term livestock grazing could be used in areas where herbicides cannot be used or where it would be beneficial to control invasive species (FWS 2011b).

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 in 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 money 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 to contain acceptable methods to be used for invasive plant

removal of river bottoms, for example, the 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.
- Maintain roads and repair access roads to river bottoms as needed (some may be service roads only).
- On the third year, contract holders begin reducing the invasive plants present by spraying or plowing predetermined areas and by planting them with mutually agreed-on crops (crop production becomes the property of the contract holder following compatibility determination).
- Use ecological site descriptions prepared by NRCS as a baseline for determining grass and forb planting mixture, but change as necessary to promote sustainable big game populations. Purchase seed mixture for planting by a contractor or cooperator.
- On contract completion, 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

Similar to upland objectives for alternative D, three bird species, all migratory birds, were selected as focal species that are important for monitoring the health of river corridors: red-eyed vireo, Brewer's blackbird, and veery. For more information about the objectives for these species, refer to the bird objectives for alternatives B and D below; objectives for threatened and endangered species and species of concern below; chapter 4, section 4.3; and appendix F.

**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 carry out the comprehensive restoration plan. Address in treatment plans the equipment needs, invasive species control, a farming plan, native plant composition mix for planting, 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 carry out 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.** The approach toward removing invasive plants in river bottoms would be slightly less aggressive than in alternative B and would be more gradually carried out. 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 viable seed sources 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 needlegrass, redosier dogwood, and silver buffaloberry would be highly competitive with nonnatives (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, short-duration grazing to reduce invasive species (FWS 2011b), 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, 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, streambank stabilization, water storage and aquifer recharge, and dissipation of streamflows (Hansen et al. 1995). Considering the importance of riparian areas, the alternatives similarly emphasize the 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, and turkeys.

**Rationale for Riparian Area and Wetland A1–A2.** Keeping with the priorities and direction set by the 1986 record of decision through 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 1995–97 to evaluate riparian conditions and was hired for the 2009 season to conduct a survey that reevaluated current riparian conditions and function and compared them to earlier surveys (Ecological Solutions Group 2009). Another contractor was hired to monitor the effects of the enclosure on Rock Creek (refer to chapter 4). Restoration practices such as shrub and tree plantings were started 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 area 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 2006–07 (refer to chapter 4).

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

### **Objectives for Riparian Area and Wetland Habitat, Alternative B**

Similar to upland and river bottom habitats, four focal bird species have been identified for monitoring the health of riparian areas and wetlands: ovenbird, Cordilleran flycatcher, black-billed cuckoo, and western wood-pewee. For more information about the objectives for these species, refer to the bird objectives for alternatives B and D below; objectives for threatened and endangered species and species of concern below; chapter 4, section 4.3; and appendix F. The following objectives are targeted toward improving riparian area and wetland conditions for all wildlife species on the refuge.

**Riparian Area and Wetland B1.** Within 2–4 years, carry out management actions to restore the health of those streams identified as “nonfunctional” (unhealthy), or “functional at risk” (healthy, but with problems). Reassess in 10–15 years using the Lotic Wetland Health Assessment Survey (Ecological Solutions Group 2011) to measure achievement of at least 85 percent of the 82 miles of stream and 1,300 acres of riparian areas that, when resurveyed, have improved to the next category (“nonfunctional” improved to “functional at risk” and “functional at risk” improved to “functioning”). Maintain 95 percent of the reaches assessed as “functioning” (healthy) in the 2009 survey (Ecological Solutions Group 2009) at that level.

**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, begin restoration of the natural hydrology of the drainage. Determine if more stock ponds are needed to meet the needs of target species. Coordinate with Montana Department of Environmental Quality for impoundment plans to ensure consistency with the total maximum daily load assessments and water quality restoration plans. (Same as Riparian Area and Wetland D2.)

*Any stock pond removal would depend on the outcome of the adjudication of water rights through the Montana Reserved Compact Commission (refer to chapter 4, section 4.2, “Water Resources”). Stock pond removal and riparian area restoration could require more permitting through USACE or through coordination with other Federal and State agencies.*

**Riparian Area and Wetland B3.** Within 4–6 years, for those reservoirs and stock ponds that cannot be removed due to species of concern, maintain or improve these areas 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 2011). (Same as Riparian Area and Wetland C5 and D4.)

**Riparian Area and Wetland B5.** Within 5–7 years, resurvey the current health of segments previously surveyed on the Musselshell River by the University of Montana, Riparian and Wetland Research Program, between 1999 and 2000 using the “U.S. Lotic Wetland Health Assessment for Large River Systems” (Ecological Solutions Group 2011). (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 would 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 requirements of the focal species and carry out the 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 and ensure monitoring is tied to focal bird species as described under the bird objectives below.

**Rationale for Riparian Area and Wetland B1–B8.** The first priority for riparian area restoration would be those sites already found to be nonfunctioning as identified by the latest riparian area study completed in the summer of 2009 (Ecological Solutions Group 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 hoof bank-shearing (where impacts from hooves shear off bank segments); value of site for forage production; and amount of vegetation stubble required to trap and hold sediment deposits during runoff events. For instance, if one of the objectives for a riparian-wetland area is streambank stability, then woody vegetation vitality should be of utmost importance due to the vastly different

streambank 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, University of Montana, developed the key to riparian and wetland sites of the refuge (Hansen 1995, Parker et al. 1996). This reference should be used whenever possible. Willows and other large woody vegetation (such as trees) filter large waterborne 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 use a stock pond. (NRCS 2005b).

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 (1998 and 1999), Montana Department of Environmental Quality (2001), and Ecological Solutions Group (2009) to determine current health.
- Set priorities for 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.
- Set priorities for stream restoration based on water rights or the ability to influence stream health.

- Locate key areas for monitoring in representative parts of the riparian-wetland areas as well as in the uplands.
- Determine the amount of vegetation stubble required to trap and hold sediment deposits during runoff events to rebuild streambanks and restore and recharge aquifers.
- Reestablish vegetation along streambanks using willow cuttings, tree revetments, perennial grasses or other streambank stabilization planting techniques.
- Restore the refuge prairie streams by using enclosures in riparian areas, applying prescriptive livestock management, rehabilitating stock reservoirs that are no longer needed and planting 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 instream 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 the beaver colonization of perennial and intermittent streams.
- Seasonally restrict livestock access to wetlands or limit duration and intensity of use and establish water troughs with escape ramps (troughs should not be placed in locations that lead to unacceptable effects on important upland habitats (Pilliod and Wind 2008). Where livestock have to cross a stream, construct a bridge, water gap, or streambed crossing.
- 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.
- Apply rangeland rest wherever and whenever possible.
- Incorporate applicable regulatory compliance (such as wetlands permitting or dam safety requirements) into stock pond removal efforts.
- Within stock ponds, incorporate logs for amphibians and turtles to bask; fish, frogs, and salamanders to lay eggs; and birds to perch.
- Provide a buffer of woody vegetation around part of constructed earthen livestock watering ponds.
- Design a monitoring plan that would 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 (Ecological Solutions Group 2011) 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 area efforts along Telegraph Creek as well as the refuge staff's restoration efforts from 1991 to 1993 in the Rock Creek/Bug Creek Habitat Unit and Hawley Creek.
- Supervise frequently to avoid adverse effects such as trampling damage to streambanks and excessive use.

### Objectives for Riparian Area and Wetland Habitat, Alternative C

**Riparian Area and Wetland C1.** Within 2–4 years, carry out management actions to restore the health of those streams identified as “nonfunctional” (unhealthy), or “functional at risk” (healthy, but with problems). Reassess in 10–15 years using the Lotic Wetland Health Assessment Survey (Ecological Solutions Group 2011) to measure achievement of at least 60 percent of the 82 miles of stream and 1,300 acres of riparian areas that, when resurveyed, have improved to the next category (“nonfunctional” improved to “functional at risk” and “functional at risk” improved to “functioning”). Maintain 85 percent of the reaches assessed as “functioning” (healthy) in the 2009 survey (Ecological Solutions Group 2009) at that level.

**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 more ponds are needed to meet NRCS range conditions across the unit. For those reservoirs and stock ponds that cannot be removed due to species of concern, maintain or improve these areas for fishing or livestock use. (See strategies for pond management.)

**Riparian Area and Wetland C3.** Within 5 years, determine the potential of selected sites and desired plant community to stabilize streambanks and eliminate hoof bank-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 quan-

tity; stabilize the streambanks; and establish proper stream channels, streambanks, 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.** Similar to alternative B, except fewer miles of streams would improve to the next condition due to a slower transition to prescriptive grazing. Management of riparian resources is geared toward maximizing livestock grazing and recreation while keeping a balance with other needs. Service resources would be allocated with the priority on improving ponds for livestock and recreation, only indirectly benefiting wildlife. With those resources, more ponds could be established using pond management. Fewer resources under large river objectives would be available for revegetation, restoration, and monitoring. Also, no resources would go toward restoring natural hydrology of first-, second-, and third-order streams.

Historical grazing by large herds of wild bison and other ungulates included long periods of rest after intensive disturbance such as drought, fire, and grazing. Wild bison did not linger in riparian areas (Van Vuren 1981, Fuhlendorf et al. 2008) 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:

- Monitor utilization annually, but determine progress in reaching long-term resource objectives (such as streambank stabilization, rebuilding of the streamside aquifer, and the reestablishment of beaver or fish habitat) over a longer period. Develop targets for riparian-wetland areas that would do the following:
  - 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 streambanks during runoff events and provide for adequate sediment filtering, and dissipation of floodwater energy

- be consistent with other resource values and objectives such as for aesthetics, water quality, water quantity, and wildlife populations
- limit streambank 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 (stocking rates are 100 2-inch largemouth bass per acre and 500 1-inch bluegill per acre (FWS 1994b)). Protect populations for 5 years.
- 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

Similar to upland and river bottom, several focal bird species have been identified for monitoring the health of riparian and wetland areas: ovenbird, Cordilleran flycatcher, black-billed cuckoo, and western wood-pewee. Refer to the bird objectives for alternatives B and D below; objectives for threatened, and endangered species and species of concern below; chapter 4, section 4.3; and appendix F.

**Riparian Area and Wetland D1.** Within 2–4 years, carry out management actions to restore the health of those streams identified as “nonfunctional” (unhealthy) or “functional at risk” (healthy, but with problems). Reassess in 10–15 years using the Lotic Wetland Health Assessment Survey (Ecological Solutions Group 2011) to measure achievement of at least 75 percent of the 82 miles of stream and 1,300 acres of riparian areas that, when resurveyed, have improved to the next category (“nonfunctional” improved to “functional at risk” and “functional at risk” improved to “functioning”). Maintain 90 percent of the reaches assessed as “functioning” (healthy) in the 2009 survey (Ecological Solutions Group 2009) at that level.

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

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

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

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

**Riparian Area and Wetland D7.** Over 15 years, provide alternate water sources for cattle away from riparian areas and sensitive upland sites, on a pri-

ority basis, where prescriptive grazing is needed to accomplish habitat objectives.

**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.** Similar to B, but slightly fewer miles may be improved due to a less aggressive schedule for implementing prescriptive grazing. All restoration would be incorporated into focal bird species monitoring.

## HABITAT—SHORELINE

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

### 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, to address habitat needs for threatened and endangered species and other species along the shoreline. (Same as Shoreline B1, C1, and D1.)

**Rationale for Shoreline A1.** 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 aid as requested. The Service is working in cooperation with 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 carry out 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



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*The spotted sandpiper uses shoreline habitat.*

would continue to collaborate with USACE in treating saltcedar, both above and below the high water line. The invasive species discussion below has more details.

(Same as B, C, and D.)

**Strategies for Shoreline A1.** None.

### Objectives for Shoreline Habitat, Alternative B

Focal bird species were not selected for shoreline habitat because the shoreline is a highly dynamic area that fluctuates based on lake levels. Potential focal bird species such as piping plover and least tern are totally dependent on the shoreline for nesting and the adjacent water for food. USACE has primary jurisdiction for management of the lakeshore.

**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 treating invasive species would be more aggressive.

### 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 help 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 who have an interest in invasive plant control to pool their resources and to coordinate control and restoration methods.
- Over 15 years, when funds are available, continue to help USACE in controlling saltcedar and restoring cottonwood.
- Over 15 years, continue to help USACE with historical plover and tern surveys so that 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—upland, river bottom, riparian area and wetland, and shoreline.

The terms and concepts for wildland fire, prescribed fire and wildfire, are based on Federal inter-

agency policy (National Wildfire Coordinating Group 2011, USDA and DOI 2009). Wildland fire is any non-structure fire that occurs in the wildland including prescribed fire and wildfire. Response to wildland fire is based on consideration of a full range of fire management actions. These include allowing a fire to be managed to achieve benefits where possible and taking suppression action when those benefits are not attainable or when there is a likely negative effect on 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 needed 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 objectives.

The Service is a member of the Montana/Idaho Airshed Group. The group comprises State, Federal, tribal, and private member organizations who are dedicated to the preservation of air quality in Montana and Idaho. Members work cooperatively to prevent smoke impacts while using fire to accomplish land management objectives. Each member that conducts prescribed burns in Montana is required to have an annual air-quality, major, outdoor-burning permit issued by the Montana Department of Environmental Quality.

### 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 shows 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; these actions could include 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 desired vegetation.

- Carry out a prescribed fire program to protect fragile habitats, valuable coniferous areas, important 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 target species or focal bird species or where needed to reduce hazardous fuel. (Same as Prescribed Fire D2.)

**Prescribed Fire B3.** Develop a patch-burning system using wildland fire to annually improve at least 2,500 acres of habitat suitable for target species and focal bird species. Additionally, reestablish the natural fire regimes (fire occurs on average every 8–70 years) for fire refugia 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 the fire management plan. (Same as Prescribed Fire C4 and D5.)

**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 the encroachment of ponderosa pine and Douglas-fir into the dry needlegrass–wheatgrass prairie by 5–10 percent. (Same as Prescribed Fire C5 and D6.)

**Prescribed Fire B7.** Over 15 years, reduce 5 percent of hazardous 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 hazardous fuel in the wildland–urban interface. (Same as Prescribed Fire D8.)

**Rationale for Prescribed Fire B1–B8.** See the rationale under “Habitat—Upland” for alternative B for a description of landscape changes since the demise of wild 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 fuel, and establishing effective partnerships.

The emphasis of the refuge’s fire management program has switched from a strict suppression orientation 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 the UL Bend Refuge are critical nesting and wintering habitat for sage-grouse. Wildland fire in an area such as this could dramatically alter the habitat and result in severe negative effects on associated wildlife (Connelly et al. 2000, MFWP 2005b). While the literature generally urges caution when applying prescribed fire to sage-grouse habitats, the literature also stresses the importance of providing a mosaic of habitats for different seasons including winter, summer, and brooding seasons (Connelly et al. 2000). Breeding habitats would be protected from fire when possible. Within 1–2 years, refuge biologists would evaluate such areas and provide fire managers with a detailed map of the essential habitat to be protected, which would be taken into account in prescribed fire and wildfire plans. For example, prescribed fire would be used to create a mosaic only when the lack of the mosaic is known to be limiting local sage-grouse populations.

Sprague’s pipit has evolved with fires on the landscape and may be limited by reduced fire frequencies (FWS 2010e). Reduced fire frequency has led to encroachment by woody vegetation and invasive grasses and forbs, excessive growth of vegetation, and excessive accumulation of litter (FWS 2010e). Timing is important because fire can have short-term negative effects but, in the long term, can also be beneficial to Sprague’s pipit.

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 hazardous 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: two prescribed fire burn bosses (type 1 and type 2), 15 prescribed fire seasonal employees, and one 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 money 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 hazardous fuel in these areas, taking into account habitat and wildlife objectives. (Same as D.)
- Evaluate critical habitat 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, Geographic Information System (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 the acquisition of 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 apply 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



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*A small, low-intensity prescribed fire in 2008.*

hazardous 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 the fuel load 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 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 non-use would be the primary criteria for selecting prescribed fire units.

**Strategies for Prescribed Fire C1–C6.** Same as 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: two prescribed fire burn bosses (type 2) and five prescribed fire seasonal employees. These additions to current staff would write burn plans and carry out a prescribed fire program.
- Within 5 years, contract with private vendors for 2,000 acres of mechanical fuel 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 D1.** 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, 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.
- 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 seminatural 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, (5) increase landscape species and structural heterogeneity, and (6) improve habitat for focal bird species (refer to the bird objectives below).

## Wildfire

Wildfire ignitions are unplanned, such as 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 2004b). In addition, this strategy may result in a larger fire but could provide resource benefits.
- Aggressively suppress that part 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 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 hazardous 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, use a full spectrum of management responses on natural ignitions and, in general, control the southern perimeter of fires south of the Missouri River that have the potential of escaping refuge lands. Initiate a full suppression response in the wildland-urban interface areas, which are the highest priority for hazardous 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 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 form 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 [NRCG] 2008).

Practices included here 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 1998). Using the proper 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 the protection of areas with 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 next 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 public and firefighter safety above all else. (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 wildfire and 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 2 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 negative 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 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 strategic operational planner, field observer, and incident commander. Increase fire staff to include 5–7 new permanent employees and 50- to 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 right for each of the various fire management options.

## HABITAT—INVASIVE SPECIES

Invasive species objectives apply to 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 of undesirable plant species, excluding saltcedar below the high-watermark, were mapped on the refuges.

The Service has been treating new infestations, working with partners to treat high public use areas, sponsoring weed wash stations, promoting education among users toward 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 (stepdown plan) for control of 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 nonwoody plants. (Same as Invasive Species C3 and D3.)

**Invasive Species B4.** Over 15 years, achieve a 25- to 50-percent reduction in acres affected by noxious nonwoody 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 River and Musselshell River corridors above the full-pool elevation by 10–25 percent. (Same as Invasive Species C6 and D6.)

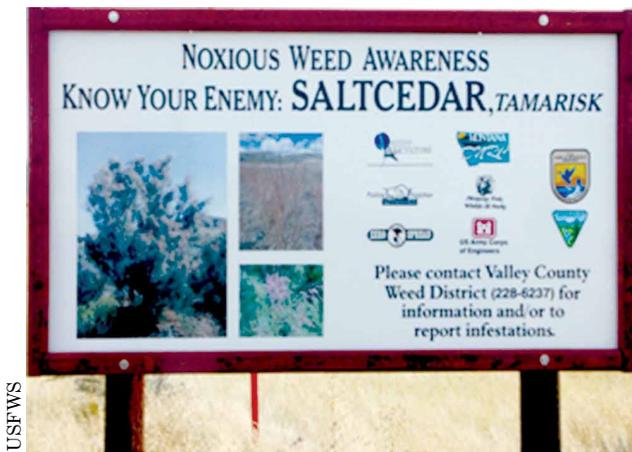
**Invasive Species B7.** Over 15 years, measure trends of invasive species not classified as noxious including Japanese brome, sweetclover, and cheatgrass. Implement adaptive management as appropriate. (Same as Invasive Species C7 and D7.)

**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, to 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 part 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 focal 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 (Davis and Duncan 1999, Dhol et al. 1994, Fairfield 1968, Johnson and Igl 2001, Kantrud and Higgins 1992, Lindmeier 1960, Maher 1974, Owens and Myres 1973, Stewart 1975, Wilson and Belcher 1989). The degradation of remaining grassland areas in the northern Great Plains is a principle factor in the declining populations of grassland bird species and is likely due to inadequate or improper management.

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 the resilience of the system.



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

### **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 contacted hunters and develop additional outreach methods to educate various users on 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 acres of Service lands plus other USACE acres of saltcedar along the shoreline each year, depending on funding by contractor and 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 infestations. 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, and include mapping criteria.
- Store all inventory data in the 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 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 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 RLGIS anecdotal observations of infestations made by Service staff while conducting other work activities.
- Map sites of invasive plant treatment each year in RLGIS.
- Monitor infestation rates and effectiveness of control efforts.
- Share GIS layers of invasive plant infestations with partners.
- Get help with invasive plants (applications and monitoring) by pursuing more money through partnerships, grants, and invasive plant programs.
- Communicate with local, State, and Federal agencies and the public about invasive plant issues. Promptly make information known 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 lands, while using integrated pest management strategies.
- Ensure seed used to restore habitat is certified weed-free. Avoid buying seed from sources known to have violated the weed-free seed regulation.
- Begin habitat management treatments to develop habitat that would be more resilient to invasive plants.
- Use short-term livestock grazing applications (prescriptive) to treat infested areas (FWS 2011b).

## 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. Global temperatures have risen, and 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), which influenced the climate change objectives herein.

### 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 negative effects. 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 ice level collapse, the thawing of frozen soil, and changes 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, follow Secretarial Order 3289 (DOI 2009) and Executive Order 13514, and implement the Service’s climate change initiatives (FWS 2010c) 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 about 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 small 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.** Within 3 years, develop a climate change research project with other partners that can be carried out across the Great Plains, which looks at fire, sentinel plants, pollinators, riparian area health, 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 waterflow and quality, and they stabilize local climates. These functions are not accounted for financially, but society depends on them. Ecosystem processes underpin photosynthesis, the plant and soil processes that recycle nutrients from decomposing material and maintain soil fertility, herbivory, predation, natural fire, 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, in and of itself, an important resource that maintains the ability of these systems to provide functions on which society depends. Many factors affect biodiversity including: 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 in the timing of seasons and animal migration. These factors are very likely to continue. The range and timing of each species shift would 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 would 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 would 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 that are having a greater affect on species viability than climate change at this time. Reduction of nonclimate stressors would promote ecological resilience and insulate species from subtle changes in climate.

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

The refuge staff is currently working with multiple partners to restore 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 chapter 1, section 1.5).

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 the 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.

Because fire happens in the region as both wild-fire and 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 climate resilience associated with diversity of species and succession (DeLuca and Aplet 2008, DeLuca et al. 2006, DeLuca and Sala 2006).

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 on carbon sequestration, monitoring, and management and on climate sentinels, ecological-process sentinels, and resilience adaptation.

#### **Strategies for Climate Change B1–B2**

- Help with the implementation of the Service's Climate Change Plan (refer to chapter 1).
- 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 potentially affected wildlife species.
- Evaluate climate sentinel plant species population viability analysis at permanently established trend sites.
- Continue to monitor wildlife populations that have been shown as "first to decline" for population 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 the 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 like that at the Sand Creek Field Station). Carefully locate any new

structures or energy-efficient equipment to limit visual obstructions.

- Study the carbon sequestration benefits of the refuge.
- Incorporate the Service's climate change messages in the refuge's public use programs.
- Assess the vulnerabilities of refuge resources to climate change.

#### **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—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.

As described in chapter 1, the Service works closely with many partner organizations in achieving its bird conservation priorities and mandates (FWS 2011c). Objectives for birds on the endangered species list are discussed following these bird objectives in the section on threatened and endangered species and species of concern.

#### **Objectives for Birds, Alternative A**

The 1986 EIS identified the following objectives.

**Birds A1.** Maintain existing migration habitat for bald eagles and determine the 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) over 15 years when weather, predation life cycles, and 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, and turkeys.

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

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

**Rationale and Strategies for Bird A1–A5.** None.

### Objectives for Birds, Alternative B

In 2005, the Service initiated the focal species strategy to better measure success in achieving its bird conservation priorities and mandates. The bird objectives are closely associated with the habitat objectives identified above.

**Birds B1.** Within 7 years, design and complete a bird atlas collection of data and information on the refuge to determine the existing composition, distribution, and relative abundance of breeding, nonbreeding, resident, and migratory bird species using the refuge during each season of the year. (Same as Birds C1 and D1.)

**Birds B2.** Within 8–15 years, repeat the bird atlas on the refuge and establish a permanent, refugewide bird-monitoring program and describe the sentinel plant associations and complete habitat requirements of 75 percent of priority focal bird species. Base the final list of focal bird species on the results of the bird atlas.

**Birds B3.** Within 10 years, complete bird management plans for each of the four habitat types (upland, river bottom, riparian area and wetland, and shoreline) for resident, wintering, breeding, and migratory bird species, with an emphasis on designated focal birds. (Same as Birds C3 and D3.)

**Rationale for Birds B1–B3.** The land base within the refuge has never had a comprehensive baseline inventory of bird species present throughout the different seasons of the year. Collecting baseline inventory data and conducting monitoring on wildlife refuges are essential for identifying conservation targets, detecting climate-related system changes, identifying vulnerable species and habitats, and evaluating management choices (Defenders of Wildlife 2008).

To help plan management actions for the greatest benefit for migratory and resident birds in upland areas, Federal, State, and nongovernmental lists



USFWS

*Sharp-tailed grouse is one of the focal species for upland habitat.*

**Table 3. Focal bird species for uplands at the Charles M. Russell and UL Bend Refuges.**

<i>Breeding habitat*</i>	<i>Sentinel plant association</i>
<p><b>BROWN CREEPER</b></p> <p><i>Associated bird species*</i>: No data available from the refuge</p> <p><i>Species of concern lists</i>: Montana Partners in Flight, Montana Natural Heritage Program, Montana Comprehensive Fish and Wildlife Conservation Strategy</p>	
<p><b>HABITAT</b>: Late-successional stages of coniferous forests and mixed coniferous–deciduous forests</p> <p><b>MICROHABITAT</b>: Large trees and snags for foraging and nesting; late-successional stages of coniferous forests and mixed coniferous–deciduous forests</p> <p><b>NEST SITE</b>: Between the trunk and a loose piece of bark on a large, typically dead or dying, tree</p> <p><b>FOOD</b>: Variety of insects and larvae, spiders, and ants (no vegetation)</p> <p><b>WINTER FOOD and HABITAT</b>: Variety of insects and larvae, spiders, and ants and some vegetation; large trees and snags for foraging and nesting; late-successional stages of coniferous forests and mixed coniferous–deciduous forests</p>	<p><b>SHRUBS and TREES</b>: Douglas-fir ponderosa pine (fire sentinels)</p>
<p><b>LONG-BILLED CURLEW</b></p> <p><i>Associated bird species*</i>: gadwall, northern shoveler, marbled godwit, northern harrier, horned lark, mourning dove, vesper sparrow, lark bunting, Brewer’s sparrow, western meadowlark, brown-headed cowbird</p> <p><i>Species of concern lists</i>: Service Birds of Conservation Concern (focal species), Montana Partners in Flight, BLM, Audubon Watchlist 2007</p>	
<p><b>HABITAT</b>: Shortgrass or mixed prairie with flat to rolling topography</p> <p><b>MICROHABITAT</b>: Areas with trees; high density of shrubs and tall, dense grass generally avoided</p> <p><b>NEST SITE</b>: On the ground, in patchy areas and relatively dry, exposed sites; often near conspicuous objects</p> <p><b>FOOD</b>: Entirely carnivorous; terrestrial insects and benthic invertebrates; pecks for food on breeding grounds; feeds on ground-nesting bird eggs and young birds in the nest; forages in shortgrass</p> <p><b>WINTER FOOD and HABITAT</b>: Not applicable</p>	<p><b>FORBS</b>: purple coneflower stiff sunflower dotted gayfeather white prairieclover purple prairieclover Maximilian sunflower</p>
<p><b>SPRAGUE’S PIPIT</b></p> <p><i>Associated bird species*</i>: Canada goose, upland sandpiper, mourning dove, American crow, horned lark, house wren, vesper sparrow, lark sparrow, grasshopper sparrow, western meadowlark, red cross-bill</p> <p><i>Species of concern lists</i>: Service Endangered Species list, Service Birds of Conservation Concern (focal species), Montana Partners in Flight, Partners In Flight Watchlist 2010, Montana Natural Heritage Program, BLM, Audubon Watchlist 2007, Montana Comprehensive Fish and Wildlife Conservation Strategy</p>	
<p><b>HABITAT</b>: Native grasslands with no shrubs</p> <p><b>MICROHABITAT</b>: Intermediate grass height and thickness with moderate litter depth</p> <p><b>NEST SITE</b>: Open grassland, usually at the base of a dense tussock of grass</p> <p><b>FOOD</b>: Arthropods, primarily grasshoppers and crickets, including forb-eating insects such as leaf hoppers and caterpillars; forages on the ground in shortgrass</p> <p><b>WINTER FOOD and HABITAT</b>: Not applicable</p>	<p><b>FORBS</b>: purple coneflower stiff sunflower dotted gayfeather white prairieclover purple prairieclover Maximilian sunflower</p>

**Table 3. Focal bird species for uplands at the Charles M. Russell and UL Bend Refuges.**

<i>Breeding habitat*</i>	<i>Sentinel plant association</i>
<b>BAIRD'S SPARROW</b>	
<i>Associated bird species</i> *: ferruginous hawk, horned lark, clay-colored sparrow, Brewer's sparrow, western meadowlark, brown-headed cowbird	
<i>Species of concern lists</i> : Service Birds of Conservation Concern, Montana Partners in Flight, Partners in Flight Watchlist 2010, Montana Natural Heritage Program, BLM, Audubon Watchlist 2007, Montana Comprehensive Fish and Wildlife Conservation Strategy	
HABITAT: Mixed native-grass prairie with scattered low shrubs (<25%) and residual vegetation; returns to burns after 3 years	FORBS: purple coneflower stiff sunflower dotted gayfeather white prairieclover purple prairieclover Maximilian sunflower
MICROHABITAT: Ungrazed to moderate grazing with high forb coverage	
NEST SITE: On the ground in tall vegetation, oftentimes at the base of shrubs	
FOOD: Insects and some seeds; insects gleaned from grass and forbs; forages on the ground between grass clumps	
WINTER FOOD and HABITAT: Not applicable	
<b>GREATER SAGE-GROUSE</b>	
<i>Associated bird species</i> *: No data available from the refuge	
<i>Species of concern lists</i> : Service Endangered Species List (warranted but precluded), Montana Partners In Flight, Partners in Flight Watchlist 2010, Montana Natural Heritage Program, BLM, Audubon Watchlist 2007, Montana Comprehensive Fish and Wildlife Conservation Strategy	
HABITAT: Mosaic of sagebrush habitats; tall sagebrush; low sagebrush; forb-rich mosaics of low and tall sagebrush; riparian meadows; native grass and forb steppe; scrub-willow; and sagebrush savannas with juniper, ponderosa pine, or quaking aspen	FORBS: purple coneflower stiff sunflower dotted gayfeather white prairieclover purple prairieclover Maximilian sunflower  SHRUBS: big sagebrush (fire sentinel)
MICROHABITAT: Leks situated on broad ridgetops, grassy swales, and disturbed sites such as burns and dry lakebeds, all having less herbaceous and shrub cover than surrounding habitats; broods found in rich mosaics of sagebrush, riparian meadows, and greasewood bottoms, all rich in forbs and insects	
NEST SITE: In relatively thick vegetative cover usually dominated by big sagebrush; also can be dominated by grasses or other species of shrubs such as rabbitbrush, greasewood, and bitterbrush	
FOOD: Leaves (dominant throughout year), buds, stems, flowers, fruit, and insects; forbs are particularly important for prelaying females; insects such as grasshoppers, beetles, and ants are important for juveniles; forb use increases as juveniles age; forages on the ground and in open habitats	
WINTER FOOD and HABITAT: Sagebrush—big, low, silver, and fringed—is essential for food with low sagebrush preferred over big sagebrush; areas are dominated by 6–43% cover of big sagebrush, low sagebrush, and silver sagebrush; variation in topography and height of sagebrush ensures the availability of sagebrush in different snow conditions	
<b>SHARP-TAILED GROUSE</b>	
<i>Associated bird species</i> *: mourning dove, vesper sparrow, grasshopper sparrow, western meadowlark	
<i>Species of concern lists</i> : Montana Partners in Flight	
HABITAT: Dense herbaceous cover and shrubs mixed with grass	FORBS: purple coneflower stiff sunflower dotted gayfeather white prairieclover purple prairieclover Maximilian sunflower  SHRUBS and TREES: silver buffaloberry aspens peachleaf willow chokecherry
MICROHABITAT: Leks occur on elevated areas with less vegetation; broods depend on areas with abundant forbs and insects with a high diversity of shrubs and cover types	
NEST SITE: Under or near shrubs or small trees or thick and taller residual grass cover	
FOOD: Forbs, grasses, insects (ants crickets, moths, grasshoppers, and beetles), fruits, and flowers; forages in areas dominated by forbs and sparse grass cover	
WINTER FOOD AND HABITAT: Buds, seeds, herbaceous matter, and fruits and forages on the ground where succulent forbs or grains are available or in shrubs and trees on fruits and buds; riparian areas, deciduous hardwood shrub draws, and deciduous and open coniferous woods; deciduous trees and shrubs important for feeding, roosting, and escape cover	

\* *Birds found in conjunction with Sprague's pipit, Baird's sparrow, long-billed curlew, and sharp-tailed grouse on refuge transects (Rocky Mountain Bird Observatory data, 2009–10). Breeding habitat data is from Cornell Lab of Ornithology (2010).*

**Table 4. Focal bird species for river bottoms at the Charles M. Russell and UL Bend Refuges.**

<i>Breeding habitat*</i>	<i>Sentinel plant association</i>
<b>RED-EYED VIREO</b>	
<i>Associated bird species*</i> : American goldfinch, American kestrel, American redstart, American robin, black-capped chickadee, brown-headed cowbird, black-headed grosbeak, Bullock's oriole, common grackle, cedar waxwing, common yellowthroat, downy woodpecker, gray catbird, eastern kingbird, house wren, lazuli bunting, least flycatcher, mourning dove, ovenbird, northern flicker, red-winged blackbird, spotted towhee, song sparrow, tree swallow, warbling vireo, western wood-pewee, yellow-breasted chat, yellow warbler	
<i>Species of concern lists</i> : Montana Partners in Flight	
HABITAT: Deciduous and mixed deciduous–coniferous forest	SHRUBS and TREES: chokecherry green ash plains cottonwood redosier dogwood boxelder golden currant peachleaf willow
MICROHABITAT: Absent from sites where understory shrubs sparse or lacking	
NEST SITE: Terminal or subterminal fork of a branch in live midstory to understory trees or shrubs	
FOOD: Mostly insects, particularly caterpillars; forages in the middle and upper third of trees; ground foraging rare	
WINTER FOOD and HABITAT: Not applicable	
<b>BREWER'S BLACKBIRD</b>	
<i>Associated bird species*</i> : American goldfinch, American kestrel, American redstart, American robin, black-capped chickadee, brown-headed cowbird, black-headed grosbeak, Bullock's oriole, common grackle, cedar waxwing, common yellowthroat, downy woodpecker, eastern kingbird, house wren, lazuli bunting, least flycatcher, mourning dove, ovenbird, northern flicker, red-winged blackbird, spotted towhee, tree swallow, warbling vireo, western wood-pewee, yellow-breasted chat, yellow warbler	
<i>Species of concern lists</i> : Montana Partners in Flight	
HABITAT: Riverbanks	SHRUBS and TREES: plains cottonwood green ash peachleaf willow
MICROHABITAT: Forages on relatively bare ground	
NEST SITE: In colonies near water	
FOOD: Insects and other invertebrates; some small fleshy fruits	
WINTER FOOD and HABITAT: Not applicable	
<b>VEERY</b>	
<i>Associated bird species*</i> : No data from the refuge	
<i>Species of concern lists</i> : Montana Partners in Flight, Montana Natural Heritage Program, Montana Comprehensive Fish and Wildlife Conservation Strategy	
HABITAT: Deciduous riparian forest	SHRUBS and TREES: boxelder redosier dogwood golden currant peachleaf willow plains cottonwood
MICROHABITAT: Requires dense understory, primarily shrubs or early successional trees	
NEST SITE: On or near the ground in deciduous trees or shrubs, often near moist areas	
FOOD: 60% insects and 40% fruits; feeds on the ground and in shrubs and trees	
WINTER FOOD and HABITAT: Not applicable	

\* Birds found in conjunction with red-eyed vireo and Brewer's blackbird on refuge transects (Avian Science Center, University of Montana bird surveys within the refuge 2005–10). Breeding habitat data is from Cornell Lab of Ornithology (2010).

**Table 5. Focal bird species for riparian areas and wetlands at the Charles M. Russell and UL Bend Refuges.**

	<i>Breeding habitat*</i>	<i>Sentinel plant association</i>	
<b>OVENBIRD</b>	<i>Associated bird species*</i> : Unknown <i>Species of concern lists</i> : Montana Partners in Flight, Montana Natural Heritage Program		
HABITAT: Contiguous tracts of large, mature trees in deciduous or mixed deciduous-coniferous closed-canopy forest	MICROHABITAT: Less ground cover; deeper leaf litter and high prey biomass	SHRUBS and TREES: plains cottonwood green ash Douglas-fir	
NEST SITE: Ground nester in sparse shrubs and small trees	FOOD: Forest invertebrates; forages low to the ground		
WINTER FOOD and HABITAT: Not applicable			
<b>CORDILLERAN FLYCATCHER</b>	<i>Associated bird species*</i> : Unknown <i>Species of concern lists</i> : Montana Partners in Flight		
HABITAT: Forest on or near streams	MICROHABITAT: Coniferous trees overhanging streams and steep banks; thick shrub undergrowth		SHRUBS and TREES: ponderosa pine Douglas-fir aspen plains cottonwood peachleaf willow
NEST SITE: Cool, shaded areas associated with water and forest openings	FOOD: Exclusively insects caught in the air or from the foliage of trees and shrubs		
WINTER FOOD and HABITAT: Not applicable			
<b>BLACK-BILLED CUCKOO</b>	<i>Associated bird species*</i> : Unknown <i>Species of concern lists</i> : Service Birds of Conservation Concern, Montana Partners in Flight, Montana Natural Heritage Program		
HABITAT: Groves of trees and thickets frequently associated with water	MICROHABITAT: Thickets of small trees and scrubs. Usually feeds within canopy but occasionally takes prey from ground	SHRUBS and TREES: chokecherry boxelder green ash plains cottonwood aspen peachleaf willow	
NEST SITE: Thick bushes sometimes associated with streams and marshes, between branches or in the crotch against the main trunk	FOOD: Large insects		
Consumes a variety of caterpillars	WINTER FOOD and HABITAT: Not applicable		
<b>WESTERN WOOD-PEWEE</b>	<i>Associated bird species*</i> : American flicker, least flycatcher, yellow warbler, lazuli bunting, spotted towhee, clay-colored sparrow, American goldfinch, eastern kingbird, common yellowthroat, field sparrow, Brewer's blackbird, Say's phoebe, western meadowlark, northern oriole, American kestrel, mourning dove, black-headed grosbeak, chipping sparrow <i>Species of concern lists</i> : Montana Partners in Flight		
HABITAT: Riparian woodland and forest, especially along the forest edge	MICROHABITAT: Large tree diameters, open understory, and dead trees or trees with dead limbs		SHRUBS and TREES: plains cottonwood green ash aspen
NEST SITE: Trees, primarily cottonwoods and also mature aspens; both living and dead trees	FOOD: Flying insects, especially flies, ants, bees, wasps, beetles, moths, and bugs; forages in the upper 25% of the canopy		
WINTER FOOD and HABITAT: Not applicable			

\* Birds found in conjunction with ovenbird, cordilleran flycatcher, black-billed cuckoo, and western wood-pewee on refuge transects ("Second Survey of Birdlife in Two Coulees near Bobcat Creek on Charles M. Russell National Wildlife Refuge," 1993; "Bird Species Composition and Abundance in Two Riparian Areas with Differing Grazing Histories on Charles M. Russell National Wildlife Refuge," 1994; "Avian Community Composition and Nesting Productivity Relative to Cattle Grazing in North-Central Montana," 2001; and "Avian Species Detected during Point-Count Surveys on Riparian Sites," 1998). Breeding habitat data is from Cornell Lab of Ornithology (2010).

were reviewed to determine birds of conservation concern that use this habitat during breeding, non-breeding, and migration. The refuge does not currently have a completed bird species list. However, based on a preliminary refuge list of 286 birds, one species is listed as endangered (least tern); one species is threatened (piping plover); two species are candidate species, meaning they are warranted but are currently precluded from listing (Sprague's pipit and greater sage-grouse); and 21 birds are on the Service's birds of conservation concern list.

Birds of conservation concern are the migratory and nonmigratory bird species beyond those already designated as federally threatened or endangered that represent the highest Service conservation priorities (FWS 2011c). The refuge is located within the Badlands and Prairies Bird Conservation Region "BCR 17". Twenty-eight birds are listed for BCR 17, and 23 of these birds are on the refuge bird list.

The Service's migratory bird program has a focal species strategy from August 2005 that identifies migratory bird species in need of focused conservation action and leads targeted campaigns to return the species to healthy and sustainable levels (FWS 2011c). Of 139 focal birds on the list, 39 are on the refuge bird list.

The refuge's focal bird species (tables 3, 4, and 5) are birds officially documented as being found on the refuge and have restrictive habitat needs that can serve as an umbrella for ecological processes as well as for other, generalist, bird species found in the same habitat type. For example, an area that supports Sprague's pipit would also support western meadowlark. Whereas, an area that supports western meadowlark does not necessarily support Sprague's pipit (Lambeck 1997).

Literature shows that 90 percent of birds rely on arthropods (insects, spiders, and other invertebrates) during at least one stage in their life. Pollinating insects are food for birds and, therefore, are a central part of a very important food web for resident and migratory birds. The resulting insect-pollinated seeds and fruits also feed birds, especially in the months when insects are not present. One very effective way to increase local pollinator numbers is to increase the native flower-producing forbs and shrubs, which not only increases the numbers of invertebrates that can be directly eaten by birds but also increases the amount of seed and fruit available for winter bird foods. By managing for the highly specialized butterflies and bees, other invertebrates, such as pollinating flies, beetles, spiders, and aphids, would also benefit. A landscape rich in quality nectar and pollen plants is central to any pollinator and bird conservation effort. (Mader et al. 2011)

Unlike many forbs and shrubs, grass flowers are wind-pollinated. Therefore, they do not attract the insect pollinators needed by most birds. Grasses do attract specific arthropods because, unlike some forbs and shrubs, most grass species lack the variety of compounds that deter herbivory, so they are readily grazed by some insects. Grasses can be the hosts of many specialized endophagous insects, which are concealed inside leaf tissue for much of their life cycle, and ectophages insects, which feed externally on leaf tissue by chewing, scraping, and sucking. Birds take advantage of these during the breeding season. Grasses can serve as host plants for some butterflies as well as potential nesting sites for colonies of bumblebees and as overwintering sites for many insects.

As with many grassland birds, heavy stocking with domestic animals negatively affects insect communities; whereas, a reduction of grazing pressure increases the insect species richness and abundance as well as bird species richness and abundance. Grassland management practices can enhance invertebrate diversity by increasing grassland diversity for healthy populations of forbs and fruit-producing shrubs as well as healthy stands of grass species (Tscharntke 1995).

Sentinel plants are the best food plants for wildlife, birds and many insects included, providing quality food in four ways: forage, pollen, fruits and seeds, and hosts to abundant insect species. Many of the refuge's sentinel plants (refer to habitat objectives above and appendix F) are also designated as Montana pollinator-friendly plants (NRCS 2005a). Several sentinel plants are also included as "most important forage and most important browse" for mule deer and elk in the Missouri River Breaks (Mackie 1970). Sentinel plants and focal birds are those species first to vanish due to changes in ecological processes. They are indicators of complete flora and avifauna (birds of a specific region or period) communities. Focal birds often have the most restrictive needs within any given area; therefore, they can be indicators of a complete avifauna. Ultimately, they are dependent on a complete flora with its corresponding arthropod community. The tasks of management are to provide structural heterogeneity at multiple scales while sustaining the complete flora and avifauna. Sentinel plants and focal birds would be the measures of success or failure. Refer to chapter 4, section 4.3, for a complete discussion of habitat needs for focal birds.

*Upland.* Six bird species—three migrants and three residents—were selected as focal bird species (table 3): long-billed curlew, Sprague's pipit, Baird's sparrow, brown creeper, sharp-tailed grouse, and greater sage-grouse. Each species was selected based on the following:

- uses the refuge for breeding
- is identified as needing conservation action
- has the most demanding requirements (late-successional stage trees and abundant insect-providing forbs and fruit-bearing shrubs) and can represent a broader group of species sharing the same or similar needs
- contributes to meeting the primary purpose for the refuge of protecting sharp-tailed grouse, which is declining in most of its range
- represents winter habitat requirements, which are of concern for the two grouse species. At times, there may be an influx of greater sage-grouse in the winter from areas outside the refuge

*River Bottom.* Three focal species—red-eyed vireo, Brewer’s blackbird, and veery (table 4)—were selected based on the following:

- nests on the refuge
- is identified as needing conservation action
- has the most demanding requirements and can represent a broader group of species sharing the same or similar needs

*Riparian Area and Wetland.* Four focal species—ovenbird, Cordilleran flycatcher, black-billed cuckoo, and western wood-pewee (table 5)—were selected based on the following:

- nests on the refuge
- is identified as needing conservation action
- has the most demanding requirements, such as late-successional stage trees and abundant insect-providing forbs and fruit-bearing shrubs, and can represent a broader group of species sharing the same or similar needs
- represents species that are primarily nocturnal flocking birds like the black-billed cuckoo, whose numbers have experienced severe declines, possibly due to pesticide use

*Shoreline.* Focal birds were not selected for the shoreline habitat because it is a highly dynamic area that fluctuates based on lake levels. Potential focal bird species, such as piping plover and least tern, are totally dependent on the shoreline for nesting and the adjacent water for food. USACE has primary jurisdiction for management of the lakeshore.

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).

### **Strategies for Birds B1–B3**

- Conduct a refugewide bird atlas to collect data four times a year, during 24-hour blocks of time,

for 7 years on the distribution, abundance, habitat use, and breeding and migratory phenology of the avifauna using each selected section of the atlas. Repeat the bird atlas during years 8–15 of the CCP.

- Work with partners, and gather historical data to add to the inventory database.
- Develop a data management system including a GIS database for recording bird sightings. Incorporate all habitat and management information into the bird data management system.
- Conduct studies to find specific connections between sentinel plant species and focal bird species.
- Carry out a vegetation monitoring program to assess if each focal bird’s habitat requirement is being met during each season of the year.
- Conduct a study to figure out the habitat needs of select focal 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.

## **Objectives for Birds, Alternative C**

**Birds C1.** Same as Birds B1 and D1.

**Birds C2.** Within 8–15 years, repeat the bird atlas on the refuge to help establish a permanent, refugewide, bird-monitoring program. Determine and describe sentinel plant associations and habitat needs of 50 percent of high-priority and focal bird species, which would be based on results of the bird atlas.

**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, such as burning and grazing, and sentinel species.

**Rationale for Birds C1–C4.** Same as B, plus designating sharp-tailed and greater sage-grouse as focal species for other grassland birds (Vodehnal and Hauffer 2007) because they are year-round residents and because they have relatively large home ranges and require vast acreages of quality grassland to sustain their populations. In February 2010, greater sage-grouse was listed as “warranted but precluded” under the Endangered Species Act (refer to chapter 4, section 4.3). Although sharp-tailed grouse are not currently listed on any agency status lists, historical records show a marked decrease in this species.

Greater sage-grouse and sharp-tailed grouse evolved with a diversity of ecological communities

that were formed by two main influences: (1) many different ecological sites; and (2) the disturbances, such as fire and grazing by native species, on these sites. Restoring and keeping these species, as well as other high-priority grassland species, means understanding, managing, and restoring these diverse grass and shrub ecosystems (Vodehnal and Haufler 2007).

#### **Strategies for Birds C1–C4**

- Conduct a refuge-wide bird atlas to collect data four times a year (during 24-hour blocks of time) for 7 years on the distribution, abundance, habitat use, and breeding and migratory phenology of the avifauna using each selected section of the atlas. Repeat the bird atlas during years 8–15 of the CCP.
- Work with partners and gather historical data to add to the inventory database.
- Develop a data management system including a GIS database for recording bird sightings. Incorporate all habitat and management information into the bird data management system.
- Conduct studies to find specific connections between sentinel plant species and focal bird species.
- Carry out a vegetation monitoring program to assess if each focal bird's habitat need is being met during each season of the year.
- 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 the needs for the current dancing ground and the nesting, brood-rearing, foraging, and fall–winter habitats for greater sage-grouse and sharp-tailed grouse on a year-round basis, including habitat and management information in each of the four general habitat types on the refuge.

#### **Objectives for Birds, Alternative D**

**Birds D1.** Same as Birds B1 and C1.

**Birds D2.** Within 8–15 years, repeat the bird atlas of the refuge to help establish a permanent, refuge-wide, bird-monitoring program and determine and describe the sentinel plant associations and habitat requirements of 90 percent of high-priority species and focal bird species.

**Birds D3.** Same as Birds B3 and C3.

**Birds D4.** Same as Birds C4.

**Rationale and Strategies for Birds D1–D4.** Same as B.



USFWS

*Endangered Black-footed Ferret*

### **WILDLIFE—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), which is not currently found on the refuge but could migrate within 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 (candidate), mountain plover, sicklefin chub, sturgeon chub, and Sprague's pipit (candidate).

#### **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 maintain a minimum of, 30 breeding pairs of black-footed ferrets on six or more prairie dog towns when animals are available and there is successful management of plague outbreaks. (Same as TES and Species of Concern B1, C1, and D1.)

**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 of 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).** Same as TES and Species of Concern A1, C1, and D1.

**TES and Species of Concern B2 (black-footed ferret).** Over 15 years, continue to provide technical and scientific assistance where possible in black-footed ferret recovery to State, conservation organization, and private landowners interested in black-footed ferret recovery. (Same as TES and Species of Concern C2 and D2.)

**TES and Species of Concern B3 (black-footed ferret).** Continue the monitoring of the existing UL Bend population and consider additional releases of captive-reared ferrets. (Same as TES and Species of Concern C3 and D3.)

**Rationale for TES and Species of Concern B1–B3 (black-footed ferret).** With successful management of plague and with partner cooperation, the refuge could produce sufficient prairie dog habitat to support a black-footed ferret population that would contribute to recovery of the species.

The Service has actively released and monitored ferrets at UL Bend Refuge since 1994. The refuge also built a captive-rearing and preconditioning facility near Malta that operated for several years, but has now been abandoned. The refuge staff have also helped 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 would collaborate with them on ferret recovery activities where possible.

(Same as D.)

**Strategies for TES and Species of Concern B1–B3 (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 to pro-



*Piping Plover*

Gene Nieminen / USFWS

vide monitoring, management and research expertise by 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 B4 (least tern).** Over 15 years, work with 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 D4.)

**TES and Species of Concern B5 (piping plover).** Over 15 years, work with 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 C5 and D5.)

**Rationale for TES and Species of Concern B4–B5 (least tern and piping plover).** Certain areas of the reservoir, some 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 B6 (pallid sturgeon).** Over 15 years, work cooperatively with MFWP and other partners along the Missouri River to develop management actions, in compliance with the recovery plan, to benefit pallid sturgeon populations. (Same as TES and Species of Concern C6 and D6.)

**TES and Species of Concern B7 (pallid sturgeon).** Over 15 years, work cooperatively with partners to mon-

itor populations of pallid sturgeons. (Same as TES and Species of Concern C7 and D7.)

**TES and Species of Concern B8 (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 C8 and D8.)

**Rationale for TES and Species of Concern B8 (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 to promote grizzly bear abundance, within ecological constraints, and to provide for recreational viewing opportunities. Grizzly bears would provide natural predation pressure on large ungulates and influence their movement around the refuge.

**Strategies for TES and Species of Concern B8 (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 educate user groups about the ecological role grizzly bears play in the environment.
- If grizzly bears are documented on the refuge, take steps to minimize potential conflicts with livestock. However, on a case-by-case basis, permit approved agents to remove grizzly bears that are documented to be depredating livestock.
- Promote, help sponsor, and conduct research on grizzly bear ecology in the Missouri River Breaks.
- Refrain from establishing a hunting season for grizzly bears on the refuge if grizzly bears are delisted.

**TES and Species of Concern B9 (black-tailed prairie dog).** Over 15 years, continue protection, restoration and expansion of black-tailed prairie dog populations refugewide 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 MFWP's "Conservation Plan for Black-tailed and White-tailed Prairie Dogs in Montana" (MFWP 2002b). 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 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).** Over 15 years, assist MFWP in carrying out the State's conservation strategies for greater sage-grouse and work with other partner agencies and organizations in sage-grouse conservation and research. Within 2 years, using MFWP's sage-grouse core area map (MFWP 2005b) and existing research projects, delineate areas of the refuge that are of high importance to sage-grouse. Adjust proposed actions and responses to wildfires to minimize short-term negative effects and maximize long-term benefits for sage-grouse and other sage-steppe-associated species. (Same as TES and Species of Concern C12 and D12.)

**Rationale for TES and Species of Concern B12 (greater sage-grouse).** In 2010, the Service determined that the greater sage-grouse was warranted, but precluded, for listing under the Endangered Species Act. On the refuge, populations are generally stable. Greater sage-grouse has been identified as a focal species for the upland habitat, refer to the bird objectives above. The sagebrush flats in UL Bend National Wildlife Refuge provide critical breeding and wintering habitat for sage-grouse.

Greater sage-grouse is adapted to a mosaic of plant communities on the refuge, with its natural variation in plant species composition, topography, substrate, weather, and frequency of fire. Leks are normally found on sites with less herbaceous and shrub cover, surrounded by potential nesting habitat. Hens have been recorded nesting 2.5–4.8 miles from leks where they are first observed. Nests are placed in relatively thick cover dominated by big sagebrush, silver sagebrush, grasses, rabbitbrush, greasewood, and other shrubs. Broods also use a variety of habitats; however, brood habitat must be rich in forbs and insects. During the winter, greater sage-grouse will use the same areas as during breeding time but can move to areas dominated by a 6- to 43-percent cover of sagebrush, depending on snow conditions. Sagebrush

is essential for winter habitat, and it dominates the late autumn, winter, and early spring diet. However, plants must be tall enough in deep snow conditions to supply needed leaves or buds for food. At all times of the year, greater sage-grouse forages on the ground in open habitats (Schroeder et al. 1999).

The Service would continue to protect essential habitat, particularly important breeding areas during prescribed fire and wildfire operations (refer to habitat and fire management objectives and strategies above for more details). The use of prescribed fire can result in a net loss of sagebrush and should be avoided in breeding areas, but it can be an effective tool for dense sagebrush cover and suppressed herbaceous cover. Wildfires are less predictable and unplanned, and they have had significant effects in upland areas on the refuge (refer to chapter 4, section 4.3). A primary objective in the CCP is to reduce severe wildfires, increase plant diversity, and provide a mosaic of habitats. The habitat objectives and strategies described above would benefit sage-grouse. This includes transitioning away from annual grazing and toward habitat-based prescriptive grazing strategies, reducing fencing, reducing invasive species, minimizing the severity of wildfire in sage-grouse habitat, continuing ongoing research, and improving overall habitat quality (Connelly et al. 2000, MFWP 2005b).

The Service would continue to help MFWP in achieving the conservation strategies for sage-grouse (MFWP 2005b). Their 2005 plan identifies core areas and outlines strategies for wildfire suppression, prescribed fire, livestock grazing, hunting, noxious weeds, and development of energy resources. Hunting would continue to be allowed. Additionally, the Service would work with other partners across the region to protect and enhance sage-grouse habitat.

**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.
- Protect brooding habitat on the refuge.
- Collaborate with private landowners and other land managers in protecting the region's sage-grouse habitat.

**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 C13 and D13.)

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

- Promote the 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.
- At least every 3 years, design and conduct 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, such as the sicklefin chub and the sturgeon chub, and develop management actions to benefit pallid sturgeon populations. (Same as TES and Species of Concern C14 and D14.)

**Rationale for TES and Species of Concern B14 (sicklefin chub and sturgeon chub).**

In 2001, the Service found that the sicklefin and sturgeon chub do not warrant listing as threatened or endangered. The sicklefin chub 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 it 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.)

**Strategy 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 (general).** 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 D14.)

**Rationale for TES and Species of Concern B1–B15.** The Service manages threatened and endangered species as trust species and is responsible for helping with 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 money and staff time prevent targeting all special sta-

tus species for management. Limited resources are allocated, in part, based on 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.

On October 4, 2011, the Service concluded that listing under the Endangered Species Act was not warranted for the northern leopard frog.

(Same as D.)

**Strategies for TES and Species of Concern B1–B15.**

Same as C and D, except:

- By 2014, evaluate and prioritize the special status species that occur on the refuge to figure out which species require active management and the level and type of management needed. Use criteria for prioritization that includes 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, and historical records pertaining to the special status species that occur on the refuge. Incorporate MFWP's 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 (including federally listed species such as black-footed ferret, piping plover, least tern, and pallid sturgeon). These strategies would include detailed prescriptions for habitat management, protocols to monitor the status of these species, and methods to evaluate the effectiveness of management actions. Monitor the effects of public use on special status species.
- 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 help USACE with historical plover and tern surveys so that the survey data remains consistent.
- Within 5 years, work with the Ecological Services branch of the Service to identify areas of critical habitat for endangered species and species of concern. Consider using prescribed fire in these areas to achieve specific resource objectives, as long as there were not significant negative effects. Identify these areas in the fire management plan as areas of special concern to be protected from wildfire.

- Collaborate with other interested parties and secure funds to hire more seasonal employees to conduct amphibian monitoring and turtle monitoring.
- See riparian area and wetland section above for strategies to improve riparian habitats that would benefit amphibians.

**TES and Species of Concern B16 (Sprague's pipit).** Over 15 years, map locations of Sprague's pipit found on the refuge. (Same as TES and Species of Concern C16.)

**Rationale for TES and Species of Concern B16 (Sprague's pipit).** In September 2010, the Service reviewed the conservation status of the Sprague's pipit to determine whether the species warranted protection under the Endangered Species Act. The status review found that listing Sprague's pipit as threatened or endangered is warranted, but is precluded by the need to complete listing actions of a higher priority (FWS 2010e). Although Sprague's pipit has been documented on the refuge, areas where pipits are found are not mapped. This species would be monitored as part of the Service's overall bird objectives and upland habitat objectives.

Sprague's pipit is an open-grassland bird and avoids poorly drained areas as well as areas with even low densities of shrubs. Pipits avoid roads and trails, requiring large patches of grassland (greater than, or equal to, 358 acres) with smaller edge-to-area ratios. These birds are most commonly found in native grasses of intermediate height and thickness with moderate litter depths. Due to the poor soils and low precipitation of the Missouri Breaks, intermediate heights are difficult to achieve when compared to their full potential in wetter areas in North Dakota and can only be accomplished by limited herbivory. Areas dominated by non-native grasses and crested wheatgrass are not used. Sprague's pipits forage for a wide array of arthropods on the ground in grass that is several inches tall. They usually nest in native grass of intermediate height and density with little bare ground.

Sprague's pipit is susceptible to habitat degradation due to high-intensity grazing and is affected by lack of fire and the subsequent increase in woody vegetation and increase in the accumulation of litter. Soon after a burn, numbers may decline but would increase in the years following a burn. For arid parts of the pipit's range including the refuge, the literature states a fire interval of 8–20 years is recommended. Mowing has negative effects on Sprague's pipits (Robbins 1999).

**Strategies for TES and Species of Concern B16 (Sprague's pipit)**

- Identify locations where Sprague's pipits occur on the refuge.

- Follow the Service's recommendations in the conservation plan for Sprague's pipit (FWS 2010e) on fire, grazing, and other tools to enhance habitat.

## Objectives for TES and Species of Concern, Alternative C

**TES and Species of Concern C1–C3 (black-footed ferret).** Same as TES and Species of Concern A1, B1–B3, and D1–D3.

**Rationale and Strategies for TES and Species of Concern C1–C3 (black-footed ferret).** Same as B and D.

**TES and Species of Concern C4 (least tern).** On plan approval and depending on lake levels, work with USACE to maintain suitable least tern nesting habitats.

**TES and Species of Concern C5 (piping plover).** Same as TES and Species of Concern B5 and D5.

**Rationale and Strategy for TES and Species of Concern C4–C5 (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 C6–C7 (pallid sturgeon).** Same as TES and Species of Concern B6–B7 and D6–D7.

**TES and Species of Concern C8 (grizzly bear).** Same as TES and Species of Concern B8 and D8.

**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 11 (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 carry out their conservation plans.

**TES and Species of Concern C12 (greater sage-grouse).** Same as TES and Species of Concern B12 and D12, except identify two leks near each field station suitable for public viewing (refer to public use objectives below).

**TES and Species of Concern C13 (mountain plover).** Same as TES and Species of Concern B13 and D13.

**TES and Species of Concern C14 (sicklefin chub and sturgeon chub).** Same as TES and Species of Concern B14 and D14.

**Rationale and Strategies for TES and Species of Concern C14 (sicklefin chub and sturgeon chub).** Same as B and D.

**TES and Species of Concern C15 (general).** Over 15 years, protect, conserve, and enhance populations of special status and their habitats. Give priority 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–C15.** Same as TES and Species of Concern B, plus there is less emphasis on habitat and population recovery and monitoring and more emphasis on getting the public involved in wildlife-dependent recreational activities associated with these special status species (see objectives for public use below). 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 place more emphasis on public use and enjoyment of these species.

### Strategies for TES and Species of Concern C1–C15

Similar to B, except there would be emphasis on public education.

**TES and Species of Concern C16 (Sprague's pipit).** Same as TES and Species of Concern B16.

**Rationale and Strategies for TES and Species of Concern C16 (Sprague's pipit).** Same as B and D.

## Objectives for TES and Species of Concern, Alternative D

**TES and Species of Concern D1–D3 (black-footed ferret).** Same as TES and Species of Concern A1, B1–B3, and C1–C3.

**TES and Species of Concern D4 (least tern).** Same as TES and Species of Concern B4.

**TES and Species of Concern D5–D10 (piping plover, pallid sturgeon, grizzly bear, and black-tailed prairie dog).** Same as TES and Species of Concern B5–B10 and C5–C10.

**TES and Species of Concern D11 (black-tailed prairie dog).** Same as TES and Species of Concern B11.

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

**TES and Species of Concern D13–D14 (mountain plover, sicklefin chub, and sturgeon chub).** Same as TES and Species of Concern B13–B14 and C13–C14.

**TES and Species of Concern D15 (general).** 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 would be used to restore natural ecological processes, which is the theme of this alternative.

**Strategies for TES and Species of Concern D1–D15**

Same as B.

**TES and Species of Concern D16 (Sprague's pipit).** Same as TES and Species of Concern B16 and C16.

**Rationale and Strategies for TES and Species of Concern D16 (Sprague's pipit).** Same as B and C.

## 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 for managing 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, increase active management 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 programs for strategic habitat conservation and landscape conservation cooperatives (refer to chapter 1), evaluate the potential for natural colonization of extirpated species into suitable habitats by evaluating current corridors. If extirpated species naturally colonize the refuge, work with the State and others to ensure refuge management is compatible with State and Federal management plans. (Same as Furbearers and Small Predators D7.)

**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 the 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 or near the refuge and reintroduction into suitable habitat would help speed population establishment.

A research project on bobcats conducted in 1979 and 1980 showed 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 help support 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. Fence areas to provide protection during the fox's reestablishment.
- 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.)

### Objectives for Furbearers and Small Predators, Alternative C

**Furbearers and Small Predators C1.** By 2014, before initiating harvest opportunities for furbearer species, develop and carry out a 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; excluding 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, the take of State-regulated furbearing species is not permitted on the refuge. Creating opportunity for sustainable use of these wildlife species would increase public and economic use.

Currently, for unregulated furbearing or small predator species, the 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 and economic use.

**Strategies for Furbearers and Small Predators C1–C3**

- Initiate studies and a monitoring program to determine populations, or indices of abundance, levels before initiating any action on opening any more furbearer species for harvest.
- Decide if trapping is appropriate and compatible with refuge purposes; if it is, complete trapping plans to allow trapping of MFWP-regulated furbearers on the refuge.
- Develop trapping plans for red fox, coyote, raccoon, and badger. Develop hunting plans for badger, raccoon, and red fox to allow the shooting of these species on the refuge.

**Objectives for Furbearers and Small Predators, Alternative D**

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

**Furbearers and Small Predators D2.** Over 15 years, maintain self-sustaining populations of furbearers by restricting and regulating harvest opportunities on the refuge when harvest begins for species regulated by MFWP (muskrat, beaver, mink, swift fox, and bobcat) and those unregulated by MFWP (least weasel, long-tailed weasel, striped skunk, badger, raccoon, red fox, and coyote).

**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.



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*American Badger*

**Furbearers and Small Predators D5.** Over 15 years, encourage research on priority furbearer species on the refuge to determine their ecological role. Universities or other organizations conduct research with refuge help in the form of money, supplies, volunteers, or technical assistance.

**Furbearers and Small Predators D6.** Within 1 year, end the taking of coyotes on the refuge by USDA Wildlife Services.

**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 and integrity and to the environmental health of the refuge.

Similar to the mountain lion, Federal law prohibits any hunting or trapping on a national wildlife refuge unless specifically authorized. To open the refuge for the hunting or trapping of furbearers or small predators, a proposal, or hunt plan, would need to be prepared that would include a justification with population status, determination of harvest levels, and monitoring results. The proposal would be subject to additional public input and National Environmental Policy Act compliance.

U.S. Department of Agriculture (Wildlife Services) conducts predator control activities along the southeast part of the refuge on private and BLM lands under cooperative agreements. This activity has declined in recent years due to fewer domestic sheep populations (personal communication with John Steuber, Wildlife Services on November 7, 2011). Wildlife Services does not conduct predator control on the refuge unless they are in pursuit of an animal or are requested by the refuge for help (by earlier agreement with the Service); however, it is difficult to discern private lands from refuge lands, which may result in some taking that occurs on the refuge. This activity would not be appropriate (603 FW1) under this alternative.

**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 found that a harvest strategy could be carried out 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 oversight for those species already protected on the refuge. Allow hunting of red fox and coyotes.
- With stable population levels, allow furbearers and small predators (coyote, long-tailed and least weasel, swift fox, skunk, beaver, 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 on furbearing animals that would be input into a newly 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 wild bison was extirpated from this area in the late 1800s (FWS 2010d). Wild bison played a significant ecological role with fire to shape the landscape. Restoring historical fire-return intervals and wild 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 wild bison restoration in North America has increased substantially in recent years. The International Union for Conservation of Nature established the Bison Specialist Group, which was charged in 2005 with developing a “North American Strategy for Bison Conservation.” That comprehensive plan is expected to be released in the near future and will provide scientifically based guidelines for proponents interested in restoring wild 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 going extinct and establishing the conservation herds that are managed today by the Service and the National Park Service for the American public.

MFWP’s Comprehensive Fish and Wildlife Conservation Strategy (MFWP 2005a) 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. In 2010, MFWP began a process to evaluate the opportunity for establishing a wild plains bison population in Montana. In 2011, MFWP published its findings. The purpose was not to make man-

agement decisions but to create the foundation for an informed public dialogue about the future of bison in the State of Montana (Adams and Dood 2011).

There would be multiple agencies, partners, and cooperators in any proposed wild bison restoration effort. The Service has taken the position that it will not consider reintroducing wild bison on the refuge unless MFWP initiates an effort to restore wild bison (Adams and Dood 2011) 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 wild bison restoration plan. MFWP does not have any plans at this time to consider reintroducing a free-ranging herd of wild bison in the area.

### **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 wild bison as a natural component on the surrounding landscape.

**Bison B2.** On advancement of a MFWP proposal that includes refuge lands in a wild bison restoration effort, develop a stepdown framework defining the conditions under which the refuge would participate.

**Bison B3.** Within 1 year of framework development (see Bison B2), and in cooperation with MFWP and other partners, develop a wild bison management plan that specifies and ranks areas of suitable habitat; establishes abundance, composition and distribution targets based on habitat conditions and appropriate wildlife and recreation management on a national wildlife refuge; and details cooperative management responses to be applied to anticipated conflicts.

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

**Rationale for American Bison Restoration B1–B4.** Any reintroduction of wild bison would need to be a cooperative venture with MFWP. At this time, the State does not have an ongoing plan to reintroduce wild 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. Therefore, 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 conducted concurrently with any proposal by MFWP for wild bison restoration in areas around the refuge.

#### **Strategies for American Bison Restoration B1–B4**

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

(Same as D.)

### **Objectives for American Bison Restoration, Alternative C**

**Bison C1.** Over 15 years, if wild bison are restored to areas outside the refuge and animals migrate into the refuge as State-managed wildlife species, adopt MFWP's 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 wild bison restoration by not actively restoring wild bison on refuge lands, but by passively accepting wild 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 population for any wild 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—NORTHERN GRAY WOLF**

Wolves were reintroduced into Yellowstone National Park in 1995 and have steadily increased in numbers to an estimated population of 566 wolves in Montana with at least 35 breeding pairs (MFWP 2011).

### **Objectives for Gray Wolf, Alternative A**

**Gray Wolf A1.** Manage the northern gray wolf in cooperation with MFWP and in accordance with the State management plan and Service policy. (Same as Gray Wolf B1, C1, and D1.)

**Rationale for Gray Wolf A1.** Should the northern gray wolf naturally colonize the refuge, the Service would adopt the State's plan and follow Service policies in monitoring and managing the species. Hunting would not be established until a proposal, or hunt plan, was developed in accordance with National Environmental Policy Act requirements and until regulations were published in the Federal Register. (Same as Gray Wolf B1, C1, and D1.)

#### **Strategies for Gray Wolf A1**

- Work with MFWP and others to document wolf presence on the refuge and to monitor abundance, distribution, and population trends if wolves become established.
- 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, remove wolves that are documented depredating livestock.
- Promote, help sponsor and conduct research on wolf ecology in the Missouri River Breaks.

(Same as B, C, and D.)

### **Objectives for Gray Wolf, Alternative B**

**Gray Wolf B1.** Same as Gray Wolf A1, C1 and D1.

**Rationale and Strategies for Gray Wolf B1.** Same as A, C, and D.

### **Objectives for Gray Wolf, Alternative C**

**Gray Wolf C1.** Same as Gray Wolf A1, B1, and D1.

**Rationale and Strategies for Gray Wolf C1.** Same as A, B, and D.

### **Objectives for Gray Wolf, Alternative D**

**Gray Wolf D1.** Same as Gray Wolf A1, B1, and C1.

**Rationale and Strategies for Gray Wolf D1.** Same as A, B, and C.

## 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 overwintering 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-deciduous shrub vegetative types in good to excellent condition to support over wintering populations of 10 deer per square mile, in a manner that would 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 post-hunting-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 with 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–A5.** The focal issue addressed in the 1986 EIS was livestock grazing and its effects on wildlife habitat (refer to chapter 2). 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 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.
- Continue to prohibit mountain lion and predator hunting. (Same as B, C, and D.)
- 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 gamebird and mourning dove hunting. (Same as C.)
- Continue to monitor boat use for accessing hunting areas along the river to ensure that wildlife species using 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 "Habitat—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 begin 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 MFWP, landowners and cooperators to expand the huntable bighorn sheep population (at least 45 rams per 100 ewes with at least 30 percent of rams having a 3/4 curl and an average age of at least 6.5 years) 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 the 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 the methodology and conduct a study of mountain lion 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 upland sections 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 would ensure these populations would 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)**

- In collaboration with the partners, use previous survey data and habitat modeling to tailor big game density objectives to specific ecological regions of



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

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 deer and elk abundance, distribution, and herd composition.
- Continue to meet with MFWP and other cooperators to implement habitat and population monitoring procedures to adjust management based on monitoring data.
- Continue throughout the life of the CCP with monitoring for chronic wasting disease in cervids, and respond as needed to the detection of chronic wasting disease as 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 livestock 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 movement.
- Continue monitoring bighorn sheep populations with aerial winter and summer counts and ground-based surveys.
- Establish monitoring programs for habitat and disease risk 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.

#### **Strategy for Big Game B10 (mountain lion)**

- Maintain and monitor GPS and very high frequency (VHF) 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 keeping a balance with other needs. MFWP management is geared toward achieving this objective (MFWP 2004).

#### **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, sporting group 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 Big Game 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 HMPs. To provide a variety of quality recreational opportunities, design hunting regulations to include population objectives with diverse male-age structures not generally managed for on other public lands.

**Big Game D2 (elk and deer).** Within 5 years, work with all partners to begin ecological studies of elk and mule deer habitat selection and response to management actions (for example, prescribed fire) and natural disturbances.

**Big Game D3 (bighorn sheep).** Manage bighorn sheep ram harvest levels to result in a minimum age of 6.5 years old for harvested rams (MFWP's 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). Manage harvest levels to maintain a population of about 225 sheep for the currently occupied sheep habitat in hunting district 622. Establish more bighorn sheep in suitable habitat.

**Big Game D4 (mountain lion).** Same as Big Game B10, except consider harvest if monitoring shows a limited harvest could be sustained (refer to objectives and rationale under “Public Use—Hunting”).

**Rationale for Big Game D1–D4.** In accordance with national policy, striving to the extent practicable to achieve consistency with State management objectives and regulations (MFWP 2001, 2004, 2009a), refuge-specific objectives for abundance and population composition would be established through habitat management plans and tailored to regional habitat conditions, productivity, and other considerations. The objectives would consider naturally functioning ecosystem processes, biological integrity, hunting opportunities, and quality of recreational experiences.

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. Before 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 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 section 4.5 in “Chapter 4—Affected Environment”). Between Service 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 37 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 MFWP's elk management plan for the Missouri Breaks 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 MFWP's 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 MFWP's Bighorn Sheep Conservation Strategy could be followed that is based on population size, ram:ewe ratio and number of 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.

A mountain lion study is ongoing within the refuge, Missouri Breaks, Bear Paws, and Little Rocky Mountains to determine density, movement, habitat, and causes of mortality. If the results show mountain lion populations are robust and healthy, the Service would consider a limited harvest (refer to objectives for “Public Use—Hunting” and chapter 4, section 4.3). Federal law prohibits any hunting or trapping on a national wildlife refuge unless specifically authorized. To open the refuge for a mountain lion hunt, a proposal (hunt plan) would need to be prepared that would include a justification including the population status, determination of harvest levels, and monitoring results. The proposal would require compliance with National Environmental Protection Act.

**Strategies for Big Game D1–D4.** Similar to B, except:

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

## 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 bottom, and riparian area objectives. Within 5 years, begin and 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 more survey work is needed to monitor and evaluate the success of the habitat objectives. While the need for understanding baseline information is important for habitat monitoring, money limitations and other staff priorities require the prioritization of these plans and surveys and coordination with MFWP, including getting necessary permits. The refuge staff currently helps with the large-scale North American Amphibian Monitoring Program and a refuge-specific monitoring strategy would be patterned on that effort.

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 would lead to species and habitat associations and adaptive management actions that are tied to the habitat objectives.

Terrestrial small mammals have limited distributions and small home ranges and require relatively high densities to maintain viable populations (Silva 2001). Therefore, 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 about 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**

- 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 structures, or diversion structures on case-by-case basis.
- To preserve and enhance populations of nongame species on the refuge, develop habitat management strategies such as detailed prescriptions for habitat management, protocols to monitor species' status, and methods to evaluate the effectiveness of management actions.
- Hire more refuge staff and encourage universities or other organizations to conduct surveys on the effects of public use, wildland fire (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 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 needs (for example, snake den sites and bat rookery or roosting sites) using 3-year rotation surveys.

(Same as D.)

**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 would 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 more fishing opportunities should increase recreational fishing visits to the area. Restoring riparian areas with native reptiles and amphibians would promote ecological health of the area. The secondary benefit of this restoration would promote diversity of other wildlife, which would lead to more 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.



*Silver Buffaloberry*

## OBJECTIVES for PUBLIC USE

### PUBLIC USE—HUNTING

Hunting is permitted on the refuge for elk, mule deer, white-tailed deer, pronghorn, bighorn sheep, coyotes, waterfowl, and upland gamebirds. 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, and recreational shooting of prairie dogs is prohibited.

#### 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 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 brochure more widely. (Same as B, C, and D.)
- Continue to prohibit most predator hunting, except permit limited coyote hunting mid-October through March 1.
- Continue to monitor boat use for accessing hunting areas along the river to ensure that wildlife species using 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, quality hunting opportunities that represent a diversity of all age classes. Within 5 years, 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 more access for hunters with mobility impairments. If warranted, within 10 years, provide one additional hunting access for hunters with mobility impairments.

**Hunting B5.** Within 4 years, working with MFWP and within the State's hunting-season framework, expand opportunities for young people to hunt with at least one new hunt that is available to only 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 the buck-to-doe ratio as identified in wildlife objectives is achieved.
- Work with MFWP to figure out the appropriate level of hunting permits for elk for achieving habitat objectives related to herd populations and herd composition. Take into account both biological integrity and landowner tolerance when setting permit levels for elk.
- Evaluate hunting district 652 (special-draw area for mule deer bucks) for mule deer home ranges, hunting district size, harvest strategy, permit numbers, habitat quality, and access and assess effects on management objectives.
- Initiate an annual tooth 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 decide where seasonal road closures may be needed to promote walk-in opportunities for quality hunting or where roads could remain open for retrieval to promote harvest in remote areas.
- Through visitor contact and hunting information, encourage hunters to walk in to hunt.
- If necessary due to increasing hunting pressure and overharvest of certain species, use 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 refuge to ensure compliance.
- Develop a policy for addressing the use of tree stands. Address the number of stands permitted and the timeframe they can be up (how many days before, during, and 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 available to only 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 bottoms, make recommendations and work with users to reduce the negative effects (for example, limit motor size or number of boats allowed on river).
- Continue to permit minimally disturbing, pack-in and 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 negative effects on habitat.
- If an area is overly affected by camping, make temporary closures or create hardened access points.
- Define current camp areas along the river to prevent campground “creep” into the riparian habitat.
- Allow boat camping along the beaches of the lake-shore.
- Continue working with USACE to restrict boat camping on 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 tearsheet that explains the accessible hunting opportunities and facilities. Post information on the Web site.

### **Objectives for Hunting, Alternative C**

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



Brett Billings / USFWS

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

**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. Within 7 years, 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 available to only 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 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 would increase license sales for MFWP and boost economic activity in the surrounding communities. This could increase the value of leased private lands within and next 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 work 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 tags for mule deer and white-tailed deer. As the bighorn sheep population expanded in areas where they were reintroduced, this would provide more 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 would report satisfaction with their overall experience.

#### **Strategies for Hunting C1–C7**

- Adopt MFWP hunting seasons and regulations for 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 the 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 use of tree stands (less restrictive than B). Address the number of stands permitted and timeframe they can be up (how many days before, during, or after a hunt).
- Work with the State of Montana to establish a special, permitted, weekend hunt for elk and deer in all hunting districts that is available to only 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 white-tailed deer tags on the refuge.
- Develop hunt plans to create harvest opportunities for those species present but not currently open for hunting (mountain lion, moose, and black bear), if biologically supported.
- If wolves arrive and establish a resident refuge population that a refuge biologist finds is hunt-able, consider establishing a limited wolf-hunting season.
- Increase outreach to hunters and create more outlets for promoting hunting opportunities to outside audiences.
- Create new partnerships, and maintain and expand existing partnerships, with hunters and hunter groups to increase awareness of hunting opportunities and 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. Include conveniences such as location from the river for easier access, 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, make temporary closures or create hardened access points. (Same as B.)
- Harden current camp areas along the river to prevent campsite “creep” into riparian areas.
- Cooperate with USACE to allow camping on river islands and along the lakeshore beaches.

- Within 5 years, evaluate the potential effects of camping on 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 hunters with mobility impairments.
- Provide priority to hunters with mobility impairments for use of the accessible blind.
- If a demand is identified, develop a second accessible blind.
- Plant crops to attract more wildlife and increase harvest opportunities.

#### **Strategy for Hunting C5 (young hunters)**

- Expand hunting opportunities for young people to hunting districts 417, 410, and 700 to recruit and promote a quality opportunity for young hunters (2015 biannual season setting process).

#### **Strategies for Hunting C6 (trapping)**

- Develop trapping plans to allow trapping of furbearers that are regulated by MFWP. Do not permit trapping of beaver and swift fox.
- Require furbearer trappers to tag traps with proper identification and report harvest within 30 days after the end of the season.
- Develop trapping plans to allow trapping of red fox, coyote, raccoon, and badger.
- Develop hunting plans for badger, raccoon, and red fox to allow shooting these species.
- Adjust current regulations to allow coyote hunting year-round.
- 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, quality, hunting opportunities on the refuge including harvesting big game animals of all age classes. Within 10 years, 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 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 more 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. To open the refuge for a mountain lion hunt, a proposal (hunt plan) would need to be prepared that would include a justification including the population status, determination of harvest levels, and monitoring results. The proposal would require compliance under National Environmental Protection Act (refer to previous objectives for big game and chapter 4, section 4.3).

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 because these seasons 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 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 allowed; 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:

- Allow no planting of domestic crops to lure big game.
- Allow vehicle access to camping areas, by the shortest route, within 100 yards of numbered roads except where closed. Do not allow off-road vehicle access to campsites in proposed wilderness areas, designated wilderness, where habitat effects warrant closing a site with a “No Vehicle” sign, and administrative areas that are posted as closed.
- Allow backpack camping throughout the refuge unless specifically closed.

## PUBLIC USE—FISHING

Fishing is allowed on the refuge. Anglers often catch catfish, walleye, northern pike, sauger, perch, small mouth bass, bullhead, paddlefish, and lake trout. 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 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 several types of opportunity: the fishery within the Fort Peck Reservoir and some opportunities associated with game fish–stocked reservoirs scattered throughout the upland part 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 partnership 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 would continue into the future and would 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. Anglers 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 allowed on the Missouri River and Fort Peck Lake.

#### **Strategies for Fishing A1–A2**

- Work with USACE on maintaining and extending boat ramps that are critical 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 driving on the shoreline.

### **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 sport fishing in the Missouri River and Fort Peck Reservoir. (Same as Fishing C3 and D3.)

**Fishing B4.** Within 5 years, evaluate and establish for young people an additional fishing opportunity or event at one additional area as part of Montana's free fishing weekend. (Same as Fishing C4 and D4.)

**Fishing B5.** Within 2–4 years, have a mechanism or agreement in place to ensure that Refuge System permit requirements are added to or incorporated with USACE- or State-issued permits. (Same as Fishing C5 and D5.)

**Rationale for Fishing B1–B5.** As with 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 work closer with MFWP to develop more 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 2009c).

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 because most fish management falls under the primary jurisdiction of USACE and 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. 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. Because 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 negatively affected by these activities.

**Strategies for Fishing B2 (paddlefish)**

- Work with MFWP to figure out an acceptable number of paddlefish permits, dates, and harvest strategies to limit conflicts among 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 important 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 boat ramps that are critical as the lake recedes due to prolonged periods of drought.
- Follow State regulations for establishment of permanent and portable ice-fishing houses.
- Seek 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.
- Identify roads that provide direct access to the lake including ATV access.
- Continue to enforce no driving on the shoreline.

**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 the 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 negatively affected.
- 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.** Similar to 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).



*Paddlefish*

Brett Billings / USFWS

**Strategies for Fishing C2 (paddlefish).** Same as B and D, plus:

- Evaluate opportunities for commercial egg harvesting.

**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 opportunities for youth and accessible fishing.
- Explore opportunities for creating more motorized access for ice fishing during the winter (Elk Hole or the Big Swirl) by providing access from the south side of the river or Timber Creek. Allow no access from the river or shoreline.
- Seek partnerships or alternative funding for establishment of more 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 more motorized access for ice fishing during winter (Elk Hole or the Big Swirl) by providing access from the south side of the river or Timber Creek. Allow no access from the river or shoreline.

## PUBLIC USE—WILDLIFE OBSERVATION, PHOTOGRAPHY, and INTERPRETATION

The refuge provides several 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 2011g) suggests, "Interpretation on refuges connects the hearts and minds of visitors with the places, objects, and resources we protect." 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, more 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, Web site, 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

**Wildlife Observation, Photography, and Interpretation A1.** Over 15 years, maintain existing wildlife observation and interpretive facilities and programs to support approximately 40,000 visitors who participate in these activities.

**Rationale for Wildlife 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 take part 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 Wildlife Observation, Photography, and Interpretation A1**

- Maintain or upgrade existing facilities, signs, Web site, brochures, exhibits, and other programs. Adhere to Service standards.

**Objectives for Wildlife Observation, Photography, and Interpretation, Alternative B****Wildlife Observation, Photography, and Interpretation B1.**

Within 5 years, develop and complete a visitor service plan that identifies specific programming elements in addition to interpretive themes, messages, and audiences for wildlife observation, photography, and interpretation to support objectives B4 and B5 (refer to table 6 in section 3.13 below about stepdown plans). (Same as Wildlife Observation, Photography, and Interpretation C1 and D1.)

**Wildlife 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.

**Wildlife Observation, Photography, and Interpretation B3.**

Within 5 years, hire an outdoor recreation planner for the refuge (refer to objectives for refuge operations).

**Wildlife Observation, Photography, and Interpretation B4.**

Over 15 years, increase participation in wildlife observation, photography, and interpretive activities by 5–10 percent annually (approximately 2,000–4,000 visits).

**Wildlife Observation, Photography, and Interpretation B5.**

Over 15 years, improve the quality and increase the number of programs or facilities for wildlife observation, photography, and self-guided and staff-dependent interpretation by approximately 5–10 percent (from alternative A). Base this on the visitor services plan and possibly include observation blinds or facilities, trails, signs, a science center at the Sand Creek Field Station, or other programs.

**Rationale for Wildlife 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 would be spent at improving habitat conditions on the refuge and, as a result, it would likely take 15 years to fully develop and carry out 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 the sections on 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 take part in nonconsumptive activities and identify the issues and needs for future facilities such as parking areas and observation areas.

Constructing more 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 would be important that new and expanded wildlife observation and photography facilities complement the natural settings within the refuge.

**Strategies for Wildlife Observation, Photography, and Interpretation B1–B5 (wildlife observation and photography)**

- Maintain the existing wildlife-viewing area.
- Recruit volunteers for the Christmas bird count and other birding events.
- Identify observation areas to the public through signage and maps.
- Develop Web site–based observation materials such as bird lists and information, maps, and Webcams.
- At Fort Peck Interpretive Center, provide a computer kiosk where visitors can access birding information such as bird songs (for example, using Thayer birding software).
- Incorporate the refuge as a stop on the Montana birding trail and regional birdwatching trails or routes. 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, and follow accessibility standards. (Refer to objectives and strategies for “Refuge Operations.”)

### **Strategies for Wildlife Observation, Photography, and Interpretation B1–B5 (interpretation)**

- Maintain exhibits at the Fort Peck Interpretive Center.
- Identify gaps in interpretative materials or programs and additional themes to expand through improved programming.
- Develop more interpretive exhibits and materials.
- Update the 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 Web site and incorporate changing interpretive content into the design.
- Increase the elk-viewing bus tours to include other communities.
- Work with Phillips County to use their buses for interpretive activities and 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, identify audiences for outreach efforts, and update the inventory annually.
- Design two, short, accessible, hiking trails with interpretive signage and brochures for visitors of all needs at the Fort Peck and Sand Creek Field Stations.
- Continue to cosponsor special events related to wildlife and habitat conservation.
- Actively publicize and take part in one national event such as National Wildlife Refuge Week and Migratory Bird Day.

### **Objectives for Wildlife Observation, Photography, and Interpretation, Alternative C**

**Wildlife Observation, Photography, and Interpretation C1.** Same as Wildlife Observation, Photography, and Interpretation B1 and D1.

**Wildlife Observation, Photography, and Interpretation C2.** Same as Wildlife Observation, Photography, and Interpretation B2 and D2.

**Wildlife Observation, Photography, and Interpretation C3.** Within 5 years, hire two outdoor recreation plan-

ners for the refuge (refer to objectives for "Refuge Operations").

**Wildlife 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).

**Wildlife Observation, Photography, and Interpretation C5.** Over 15 years, improve the quality and increase the number of programs or facilities for wildlife observation, photography, and self-guided and staff-dependent interpretation by approximately 5–15 percent (from alternative A). Base this on the visitor services plan and possibly include observation blinds or facilities, trails, signs, an interpretive center at Sand Creek Field Station, or other programs and facilities.

**Rationale for Wildlife 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 2009e). 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 2008b, 2009e).

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, birdwatching 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 more 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).

Similar to alternative B, within 5 years a visitor experience survey would be started and a visitor services plan would be written to take a more comprehensive look at the overall program and facil-

ities 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 Wildlife 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 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 birdwatching trails for public use. Work with partners to establish 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 Wildlife Observation, Photography, and Interpretation C1–C5 (interpretation).** Same as B, plus:

- Develop a tour map with geological and biological information for the refuge.
- Develop a portable tabletop exhibit.
- Enhance, update, and improve exhibits at the Fort Peck Interpretive Center.
- Explore open-captioning audio–visual 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 resources.
- Improve visitor contact areas at the Sand Creek, Fort Peck, and Jordan Field Stations. Make brochures always available.
- Update the Web site and incorporate changing interpretive content into the design.
- Start 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 the refuge headquarters in Lewistown and at the three field stations. Ways to do this follow:
  - Establish native plant gardens with interpretive information.
  - Add interpretive information to all office artifacts and mounts.



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Refuge staff member conducting an interpretive field trip on the refuge.

- Coordinate with the Fort Peck Interpretive Center on natural landscaping and interpretive programs.
- Actively publicize and take part in three events such as National Wildlife Refuge Week or Migratory Bird Day.

### **Objectives for Wildlife Observation, Photography, and Interpretation, Alternative D**

**Wildlife Observation, Photography, and Interpretation D1.** Same as Wildlife Observation, Photography, and Interpretation B1 and C1.

**Wildlife Observation, Photography, and Interpretation D2.** Same as Wildlife Observation, Photography, and Interpretation B2 and C2.

**Wildlife Observation, Photography, and Interpretation D3.** Same as Wildlife Observation, Photography, and Interpretation C3.

**Wildlife Observation, Photography, and Interpretation D4.** Over 15 years, increase participation in wildlife observation, photography, and interpretive activities by about 15–25 percent (approximately 6,000–10,000 more visits annually).

**Wildlife Observation, Photography, and Interpretation D5.** Over 15 years, improve the quality and increase the number of wildlife observation, photography, and self-guided and staff-dependent interpretive programs or facilities by approximately 10 percent (from alternative A). Base this on the visitor services plan and possibly include observation blinds or facilities, trails, signs, a science and interpretive center at Sand Creek Field Station, or other programs and facilities.

**Rationale for Wildlife 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 a 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 experience-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 Wildlife Observation, Photography, and Interpretation D1–D5.** Same as B, plus:

- Explore new areas to promote for wildlife observation and photography opportunities, such as expansion of elk-viewing opportunities.
- Where possible, establish universally accessible observation blinds.
- Start grouse-viewing programs and provide accessible blinds that allow visitors to view grouse on leks after peak hen attendance (peak attendance of male grouse occurs toward the end of the breeding season, providing visitors 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 trail system for families and people with disabilities.
- Develop 2–5 miles of primitive hiking trails including one on the 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 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 Stations' 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) by about 5 percent (identify program elements in the overall visitor services plan for all public uses). (Refer to table 6 in section 3.13 below about stepdown plans).

**Rationale for Environmental Education B1.** The Service is committed to connecting people with nature through initiatives such as “Children in Nature” (FWS 2009c). 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 more staff, there would be a moderate increase in the quantity of environmental education programs. The programs would focus on wildlife biology and habitat requirements and would modify existing curricula to highlight refuge issues. Because environmental education is curriculum-based and labor intensive, initial efforts would be limited to Fort Peck and Lewistown Field Stations when an outdoor recreation planner is hired.

**Strategies for Environmental Education B1**

- Develop an environmental education program as part of the visitor services stepdown plan.
- Identify gaps in environmental education materials and programs, conduct a visitor experience

survey, and identify additional themes to expand through improved programming.

- 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, the “Lets go Outside” initiative).
- Respond to requests for technical assistance for curriculum-based environmental education (for example, Range Days, Bio-Blitz, Envirothon, and Field Days).
- Use the refuge Web site to promote environmental education; include a downloadable podcast.
- Annually offer two teacher workshops to all interested school districts in central and eastern Montana to promote 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.) Include potential topics such as prairie streams, prairie plants and wildlife, climate change, 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 environmental education programs (on- and off-refuge) by about 25 percent (identify program elements in the visitor services plan). (Refer to table 6 in section 3.13 below about stepdown 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 would be developed in compliance with State standards.

Because it would be more labor intensive, more staff would be needed (two identified; refer to objectives for “Wildlife Observation, Photography, and Interpretation”).

**Strategies for Environmental Education C1.** Same as B, except:

- Annually offer five teacher workshops 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. Include potential topics such as prairie streams, use of fire, prairie plants and wildlife, invasive plants, paleontological resources, climate change, 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 in local schools.
- Build on existing relationships with schools for both onsite and offsite programming.
- Refuge staff or volunteers present at job education days at local high schools.
- Over 15 years, work with partners to create up to two environmental education curricula unique to the refuge, with potential topics including prairie streams, use of fire, prairie plants and wildlife, invasive plants, climate change, 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.

### Objectives for Outreach, Alternative A

**Outreach A1.** Over 15 years, continue 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 take part 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 the public informed about refuge programs and activities.

### Objectives for Outreach, Alternative B

**Outreach B1.** Same as Outreach A1.

**Outreach B2.** Within 10 years, build greater awareness and appreciation for the Service and refuge resources, with a resulting 5-percent increase in requests for information, visitation, and Web site hits.

**Outreach B3.** Within 5 years, engage outside audiences (such as interested groups, the public, or visitors) in at least two meetings, presentations, or open houses per year.

**Rationale for Outreach B1–B3.** The refuge would increase its outreach efforts through active participation in local events and meetings or by developing a Friends group (a nongovernmental organization that

### 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 (identify program elements in the visitor services plan). (Refer to table 6 in section 3.13 below about stepdown 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 climate change and ranching history would be included. Existing curricula would be modified to highlight these issues and at least one new curriculum would be developed in compliance with State standards.

**Strategies for Environmental Education D1.** Same as B, plus:

- Annually offer two to four teacher workshops to all interested school districts in central and eastern Montana promoting refuge-based (local community) and regional-based information.

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 Web site would be one way for the refuge to reach out to a larger audience. Recent data suggests that "hits" (visits to the Web site <<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. Before hunting season, hits to the Web site increase from all over the United States as well as residents in Montana.

### **Strategies for Outreach B1–B3**

*Same as A, plus:*

- Actively take part 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 CCP approval.
- Improve the refuge's Web site by adding at least two of the following:
  - Photographs of the refuge.
  - Videos of elk in rut, prairie dog towns, and sage-grouse and sharp-tailed grouse leks.
  - Increased Webcam feeds.
  - Blogs with refuge-specific information on a prairie dog town or the elk-viewing area. Include a downloadable podcast.
  - Information on travel conditions for roads.
  - Downloadable versions of all refuge brochures.
- Annually conduct two information-sharing events (such as interviews, public service announcements, and writing articles) with the media (newspaper, television, and radio), chambers of commerce, congressional contacts, and tourism outlets.
- Develop an outreach plan as part of the visitor services plan (refer to table 6 in section 3.13 below about stepdown plans).
- Work with the Montana tourism department to promote the refuge and its resources.

### **Objectives for Outreach, Alternative C**

**Outreach C1.** Within 10 years, build greater awareness and appreciation for the Service and refuge resources, with a resulting 15-percent increase in requests for information, visitation, and Web site hits.

**Outreach C2.** Within 5 years, engage outside audiences such as interested groups, the public, and potential visitors in at least five meetings, presentations, 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 the CCP and a second volunteer group focused on advocating for the refuge.
- Use the Internet to complete four to six of the following activities:
  - Photographs of the refuge.
  - Videos of elk in rut, prairie dog towns, and sage-grouse and sharp-tailed grouse leks.
  - Increased Webcam feeds.
  - Blogs with refuge-specific information on a prairie dog town or the elk-viewing area. Include a downloadable podcast.
  - Information on travel conditions for roads.
  - Downloadable versions of all refuge brochures.
- 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.** Within 2 years, build greater awareness and appreciation for the Service and refuge resources, with a resulting 5- to 10-percent increase in requests for information, visitation, and Web site hits.

**Outreach D2.** Within 5 years, engage outside audiences such as interested groups, the public, and potential visitors in at least three meetings, presentations, or open houses per year. Provide information to audiences about the importance of the refuge goal of restoring ecological processes and increasing the resiliency of refuge habitat to nonclimate stressors and climate change stressors.

**Rationale for Outreach D1–D2.** Similar to C, except outreach would focus on the refuge's goal of restoring ecological processes and increasing the resiliency of refuge habitat to nonclimate stressors as well as climate change stressors. 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, and 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. Several graveled roads provide direct access to the refuge. All other roads are passable only in dry weather. 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 allowed on the refuge although special regulations apply on the western edge, which is part of the National Wild and Scenic River System (refer to hunting objectives for further discussion of monitoring boat access). 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 3, section “3.2 Elements Common to All Alternatives” and to chapter 4).

### Objectives for Access, Alternative A

**Access A1.** Over 15 years, keep about 670 miles of roads and trails open (see figure 7) and maintained to existing standards.

**Access A2.** Within 3–5 years, work with partners to develop a 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 allowed 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 dovetail 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, ATV use on public roads, and bicycling on numbered roads (including seasonally closed roads).
- Permit public planes to land only on water or ice as determined by USACE’s plan.
- Keep roads closed in proposed wilderness units.

### 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 reconfigure the refuge road system, closing about 106 miles of roads or sections of roads that no longer provide a public benefit or do not help achieve habitat objectives.

**Access B4.** Within 5 years, 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”). Most 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 money 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 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 negative wildlife effects—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 money and staff to the evaluation of 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 the disturbance to wildlife.
- Within 2–5 years, assess the use of mountain bikes on all numbered routes, seasonally closed roads, and closed roads.
- Study the effects of recreation in proposed wilderness and wilderness along with closed, seasonally closed, and numbered roads to evaluate current restrictions and the effects of recreation on wildlife and habitat.
- Work with private landowners, counties, USACE, BLM, and MFWP to identify roads that provide legal public access on or off the refuge. Acquire legal access where needed and feasible.
- Remove all roads that provide exclusive access to the refuge because of inaccessible private lands within or outside the refuge.
- By 2014, produce a GIS road layer and public use “Guide Map” that shows legal public access on the refuge; designates all-weather roads, 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 with 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 undesignated vehicle trails off system roads, i.e., road stems.
- Maintain directional signage and improve the wayfinding system as needed.
- Develop road management systems to compete for national funds.
- Perform “hot spot” road safety audits (for example, such problem areas as Knox Ridge and Sandy Creek Road).
- Perform an audit of the 100–200 series of roads within 3 years.

#### **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.** Several 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 figure out 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:

- Improve access by diverting refuge money and staff to purchase rights-of-way for graveling all-weather roads; creating more parking for persons with disabilities; developing trailheads, vehicle parking areas, and camping sites; and providing equestrian facilities.

- When it is determined that a form of access has no negative effect on wildlife populations, consider increasing or improving that access.
- Within 5 years, evaluate all roads that end at the water's edge to figure out if it is feasible to construct boat ramps for water access.
- Increase access to the lake and river for fishing and other uses by identifying roads that lead to the water's edge.
- Increase opportunities to access wilderness by creating parking lots next to proposed wilderness units.
- Work with counties and others to upgrade added all-weather roads to and on the refuge (for example, Knox Ridge and Turkey Joe).
- Evaluate the opportunity for motorized vehicles on the lake and river during winter (for example, ATVs and snowmobiles) and consider providing seasonal access to desirable winter fishing holes such as those at Swirl, Elk Hole, and Timber Creek.
- Institute seasonal use of the roads where appropriate.
- Improve roads next 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 more pulloffs 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 the wayfinding 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 reconfigure the refuge road system. Initially close 21 miles of roads and seasonally close 15 miles of roads (designate 13 miles on the northeast part of the refuge as game retrieval roads, and seasonally close road 315 from its junction with road 838) as needed to encourage free movement of animals, permit pre-

scribed 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). Once the transportation plan is completed, close or modify more roads as necessary.

**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 appear more than once below):

- for protection of wilderness values—306 and 311
- to increase blocks of undisturbed habitat or reduce negative wildlife effects—320
- to address safety or maintenance issues—374 (part 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

Seasonal closures would be carried out on roads 315, 440, 331, 332, 333 to improve wildlife security, reduce displacement of wildlife due to motor vehicle use, and provide optimum winter habitat for wildlife.

**Strategies for Access D1–D4.** Same as B, plus:

- Consider money and staff needed for opening and closing roads (including seasonally closed roads), developing more access points, or making changes in access.
- Designate parts of roads 440, 331, 332, and 333 as game retrieval roads (opened for set hours during hunting season for game retrieval only). Designate road 315 as seasonally closed from the junction with road 838 to its end (from the end of August to March 1).

- Consider ways to improve opportunities for visitors to take part in nonconsumptive uses such as by providing viewing areas.
- Consider improving Knox Ridge Road for all-weather access (gravel).
- Work with other agencies and 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, the north fork of Rock Creek and Big Dry Arm).
- Replace structures that are barriers to aquatic organisms (for example, use 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 more 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 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 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) are 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 allowed 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 USACE to further define 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 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 the 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 campsites that would meet the 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:

- To improve the experience, consider the possibility of expanding into already disturbed land around the existing recreational area and improving existing recreation facilities, for example,

more restrooms and landings accessible to people with disabilities.

## 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 stopped 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.

**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 and 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 2002a) 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 the current intensity of outfitting to find out 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 the 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 (parameters 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.
- Provide proactive enforcement with the refuge's and other agencies' law enforcement officers.

## Objectives for Commercial Recreation, Alternative C

**Commercial Recreation C1.** Same as Commercial Recreation B1.

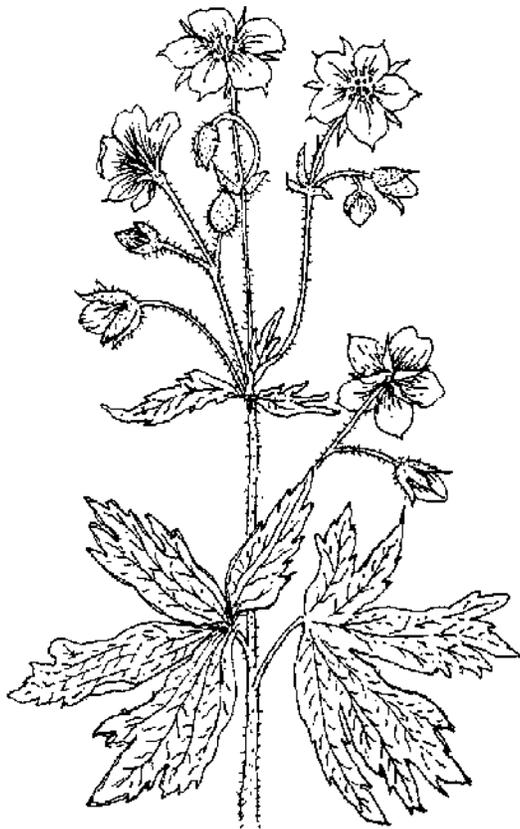
**Commercial Recreation C2.** Within 5 years, implement a wilderness guide and retrieval permit to promote harvest of surplus game animals in proposed wilderness units.

**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

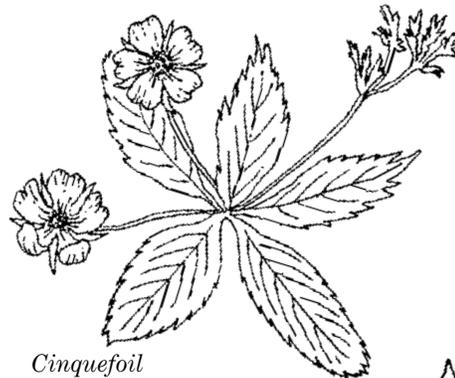
proposed wilderness units. These roadless areas provide security habitat for a variety of wildlife. These outfitting permits would promote harvest of cow elk that would help to reduce local populations. This would also create an economic opportunity to local outfitters and provide for a quality recreational 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.
- Authorize extended camping when requested to facilitate commercial use.



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*Cinquefoil*  
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*Lupine*  
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- Promote commercial outfitting through media outlets on an annual basis.
- Collaborate with others to promote ecotourism opportunities on the refuge and throughout the Missouri River Breaks.
- Create a new outfitting permit for guiding and 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 permits for guiding and retrieval in the proposed wilderness if cow elk continue to increase or are causing negative effects on vegetation in the area.

## OBJECTIVES for WILDERNESS

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 Refuge. Service policy requires a review of proposed wilderness including making recommendations on whether more 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, complete 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 2008c) 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 a minimum requirements analysis 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, expand or adjust existing proposed wilderness units by 25,869 acres in Antelope Creek, West Beauchamp Creek, Crooked Creek, Alkali Creek, East Seven Blackfoot, West Hell Creek, Sheep Creek, Wagon Coulee, and Mickey Butte to conserve and promote wilderness qualities and characteristics of the units. Refer to any expansion or adjustment as a wilderness study area until formally transmitted to Congress (figure 8 and appendix E).

**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 several key considerations in evaluating the tangible and intangible aspects of wilderness character as described in the Wilderness Stewardship Policy (FWS 2008c) 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 (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.
- Inform and educate the public about wilderness on the refuge by adopting some or all of the interpretive themes identified for wilderness education in the wilderness stewardship policy.
- Implement wilderness character monitoring protocols (developed in 2011).

### Objectives for Wilderness, Alternative C

**Wilderness C1–C2.** Same as Wilderness A1–A2, B1–B2, and D1–D2.

**Wilderness C3.** Same as A3.

**Wilderness C4.** Same as Wilderness A4, B4, and D4.



Proposed wilderness units on the refuge provide secure habitat for wildlife like these bighorn sheep.

**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. Few roads would be proposed for closure under this alternative, and access would be improved in some areas.

Following the wilderness review conducted for the draft CCP and EIS (appendix E), and in consideration of the emphasis on public and economic uses, the Service would not expand or adjust any wilderness unit.

**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, expand or adjust the existing proposed wilderness units by 19,942 acres in Antelope Creek, Crooked Creek, Alkali Creek, East Seven Blackfoot, West Hell Creek, Sheep Creek, Wagon Coulee, and Mickey Butte to promote and conserve wilderness qualities and characteris-

tics while minimizing impacts to access outside of the units. Refer to any expansion or adjustment as a wilderness study area until formally transmitted to Congress (figure 10 and appendix E).

**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 would increase security for wildlife, reduce habitat fragmentation, invasive species infestations, and provide other positive wildlife benefits, which are important considerations in restoring ecological processes.

Eight units totaling 19,942 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 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 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.** Within 5 years, 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 that describes the nature and extent of past cultural resource inves-

tigations, 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 would 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 for finding 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 would outline specific threats to the resources and the ability of future studies to address regional research questions. It would 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 about 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 the 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, mitigate adverse effects that are compromising the integrity of the resource.
- 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 resource locations based on previous surveys on the refuge and the surrounding areas, in consultation with the State Historic Preservation Officer, the Tribal Historic Preservation Office, and other professionals.
- Make the cultural resources sensitivity model available to appropriate staff.
- Ground-truth the cultural resources sensitivity model when possible.
- Update and refine the cultural resources sensitivity 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. Determine the best strategy to make the information and artifacts useful and available.
- Protect and store historic items of value in archiving-stable materials under environmentally appropriate conditions.
- 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 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 more 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 more 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”). Several collections are on display at the Fort Peck Interpretive Center. Collection of any fossils is not allowed 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 an 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 stepdown plan for paleontological resources. Ensure the plan specifies guidelines for 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 stepdown plan. The plan would include guidelines to decide when and how to issue permits for science and education. Mon-

tana 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, the Bug Creek Fossil Area and the Hell Creek Fossil Area.

#### Strategies for Paleontological Resources B1–B3

- Increase law enforcement to protect the paleontological areas.
- Educate the staff on paleontological laws and their implication for management and protection of paleontological resources on the refuge.
- Potentially develop more 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 buying inholdings for protection of paleontological resources.

### 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 OPERATIONS, PARTNERSHIPS, and RESEARCH

### 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 money 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 mineral 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 9 (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 several seasonal staff at the refuge (refer to table 9 in section 3.14 below). This includes positions that are funded by general refuge operations money and fire money (separate account). While money 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.



USFWS

*A Service employee prepares to release an endangered black-footed ferret on the refuge.*

- 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 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.

#### Objectives for Refuge Operations, Alternative B

**Operations B1.** Same as Operations A1, plus seek permanent withdrawal from Congress of all minerals, including oil and gas and other leasable and locatable 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 for full-time and seasonal positions and volunteers to fully carry out the CCP as identified in table 9 (section 3.14 below). (Same as Operations C5 and D4.)

**Rationale for Refuge Operations B1–B5.** Same as A, plus the Service would seek a permanent withdrawal for minerals from Congress (only Congress can order this designation) to permanently protect refuge resources. Current techniques for extraction of leasable and locatable minerals including oil and gas are not compatible with the primary purposes of the refuge. 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 stepdown 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 more facilities (blinds, trails, or tour routes) including a lek blind for sage-grouse and sharp-tailed grouse as identified in the visitor services plan.
- Design and map birdwatching trails for public use.
- Fill one outdoor recreation planner position for the Lewistown or Fort Peck Field Station. If feasible, add a second position.
- Add more law enforcement personnel for Fort Peck Field Station. (Same as C and D.)
- With an increase in fire money and through the Refuge Operations Needs System database, continue to work toward 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 hire 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 birdwatching 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 landown-

ers next 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 Reserve, 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 several 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 outlines habitat conservation strategies across the landscape for the species mentioned in Partnerships A3. (Similar to Partnerships 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 landownership. 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 among 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 pres-

ures (converting grassland to crops) are a few of the habitat limitations that negatively affect 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.
- 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 or memoranda of understanding with private landowners, nongovernmental agencies, local tribes, and BLM to manage 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 or prairie dog towns.

**Partnerships B5 (volunteers and friends).** Within 5 years, 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 2008d). 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 stations by giving information to local community and elected officials. There are more than 200 Friends groups across the Service (FWS 2008d). To carry out the refuge's habitat and public use objectives, the Service would establish an active volun-

teer 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 Friends group and volunteer opportunities on the Web site, 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 bird-watching trails or routes.
- 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 refuge and 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 Reserve, Ranchers Stewardship Alliance, and The Nature Conservancy) and interested private landowners develop habitat management treatments that benefit livestock operators and provide adequate habitat for a suite of prairie species that have large home ranges 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 next to the refuge and con-

servation 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 benefit livestock operations and selected wildlife species.
- Enter into a memorandum of understanding with interested partners to manage lands for sentinel plants and natural ecological processes such as historical fire occurrence.
- Manage sentinel wildlife such as prairie dogs to support the full suite of wildlife that rely on prairie dogs 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 partnerships with photography clubs to provide five nature photography workshops on the refuge.
- Over 15 years, collaborate with other groups to provide three more Web-based cameras or video cameras 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 that USACE, BLM, MFWP, DNRC, the six counties, tribal governments, conservation organizations (World Wildlife Fund, American Prairie Reserve, Ranchers Stewardship Alliance, and The Nature Conservancy) and interested private landowners 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 partners' focus areas.

**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 skunk-bush, winterfat, golden currant, and buffaloberry. By improving the health and distribution of these sentinel plants the overall health of various wildlife species would be improved as well. By restoring pyric-herbivory processes and managing for total ungulate populations, the overall health of these plants and habitats would 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:

- Conduct 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 partnerships 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 camera 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 partnership 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.** Within 5 years, 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.** Within 1 year, monitor visitor counts to determine the number and types of visitors on the refuge, and by 2017 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 can be affected by climate change.
- Include questions on a visitor use study aimed at quantifying the type and amount of public use occurring in the wilderness.

### Objectives for Research, Alternative C

**Research C1–C6.** Same as Research B1–B6.

**Research C7.** Within 5 years, begin 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 conducted on the refuge, more 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:

- Within 5 years, work with MFWP to conduct research on the age structure of mule deer herds 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, Federal Aviation Administration, 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 negatively affect potential piping plover nesting areas, although there are no nests there currently. The environmental assessment also identified localized negative effects on air quality, noise, and visual quality due to added 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 outgrant more Fort Peck Project lands to the Service (USACE 2004). (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 2008a,c).

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 for greater sage-grouse, black-tailed prairie dog, bald eagle, bighorn sheep, designated sensitive species, and big game (winter range). Unavoidable effects of the plan alternatives were limited to localized, negative effects on soil erosion and vegetation from ground-disturbing activities (BLM 2008c).

#### Wilderness Study Areas (BLM)

BLM has several designated wilderness study areas near or next to the refuge. These include Seven Blackfoot, Burnt Lodge, and Antelope Creek wilderness study areas.

#### Sage-Grouse Conservation (BLM)

In 2004, BLM developed a national conservation strategy for sage-grouse habitat (BLM 2004). Additionally, BLM is in the process of amending or revising all its resource management plans to create a better regulatory structure for sage-grouse conservation.

#### Military Operations

The refuge is located below the Hays Military Operations Area. The Federal Aviation Administration is responsible for all airspace in the United States. The Improvement Act specifically exempted overflights above a refuge from compatibility requirements (FWS 2000a); therefore, the refuge does not have control over military overflights. These operations occur over the western boundary of the refuge and are infrequent and irregular. No further information is known about any negative effect these operations have on refuge wildlife or visitors. Refer to chapter 1, section 1.9, for more information.

## 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 ways 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 2008b):

- 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 (MFWP 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.



*Prairie Dog Town*  
Bob Savannah / USFWS

## 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 2005b).

## NONGOVERNMENTAL CONSERVATION ACTIVITIES

The American Prairie Reserve, The Nature Conservancy, World Wildlife Fund, National Wildlife Federation, and Ranchers Stewardship Alliance conduct conservation activities on large acreages next to or on the refuge.

### American Prairie Reserve

Since 2004, the American Prairie Reserve has been working to create the American Prairie Reserve on private lands next to the north side of the refuge in Phillips County. The mission of American Prairie Reserve 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 2011). The foundation has been working on bison restoration, pulling interior fences, conducting stream restoration studies, bison and livestock studies, and other activities. Many stewardship activities are conducted in partnership with the refuge.

The American Prairie Reserve owns or leases 123,000 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 more leases and acquisitions. Several new properties are under nego-

tiation (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).

Throughout the northern Great Plains, including Montana, land is being converted from native grassland or rangeland into crop production. From 2005–09, more than 13,000 acres were converted to cropland within the six-county area (personal communication with Robert Sanders, Ducks Unlimited, June 23, 2010). Landowners are responding to higher market prices for agriculture by converting grassland into crop production. Organizations such as the Nature Conservancy, Ducks Unlimited, and other organizations are working to conserve grassland throughout Montana’s northern prairie.

### **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 support 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 completed, retiring grazing on 55,261 acres (National Wildlife Federation 2011). 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 landownership patterns are also expected to bring changes in local communities, and prevailing attitudes values about wildlife, natural resources, and refuge management.

## **INFRASTRUCTURE DEVELOPMENT**

In 2008, TransCanada Keystone Pipeline, LP, filed an application for a Presidential permit for the construction, 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 August 26, 2011, the U.S. Department of State released a final EIS for the proposed TransCanada Keystone XL Pipeline Project (U.S. Department of State 2011). In January 2012, the Obama Administration denied a permit for the proposed pipeline, but there could be further action on this project in the future.

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 final EIS anticipated general effects associated with ground disturbance and construction. The final 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 final EIS finds 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 final EIS found that the project would not likely affect the courtship activities of sage-grouse on leks and would likely result in a minor negative effect on nesting birds (U.S. Department of State 2011).

## **3.10 ELEMENTS CONSIDERED but ELIMINATED from FURTHER CONSIDERATION**

During scoping and alternatives development, the Service or interested groups and the public suggested several 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 change 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, using, in accordance with Federal and State laws, methods and procedures associated with modern scientific resource programs.”

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 (Higgins 1986). Even if wild bison (extirpated from the area in the late 1800s) were to be restored to parts 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 invasive species and 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 needed. Several habitat

units have never allotted livestock grazing. Livestock are kept out of most riparian areas along the Missouri River, and there are cattle exclosures scattered across the refuge. Most areas that are managed under prescriptive grazing are largely being rested (refer to figure 16). One alternative (B), considers implementing prescriptive grazing over most of the refuge in an accelerated implementation timeframe within 4–7 years. Implementation would include long periods of rest, and livestock grazing would only be used to meet specific habitat objectives. In accordance with the Service’s compatibility policy, the use of prescriptive grazing will be periodically reevaluated, and the refuge manager could modify and reevaluate the existing determination (FWS 2000a). A 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 singled out sharp-tailed grouse and pronghorn for protection in 1936 (in addition to other wildlife), since then, there have been several Executive orders, laws, and policies that have guided the management of the refuge. Livestock grazing is only a provision to the extent that it remains compatible with the primary purposes. 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 refuge 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**

Several 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 2008c), the Service did not consider reopening formerly closed roads in existing proposed wilderness units. The Service uses 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.

## REDUCTION of PROPOSED WILDERNESS AREAS

During the scoping period, several people asked the Service to consider reducing the number of proposed wilderness areas on the refuge. The Service initially considered this idea under two alternatives (C and D) and evaluated several options in the draft CCP and EIS. Although this consideration does not specifically conflict with the Service's Wilderness Stewardship policy, it does conflict with the policies of other agencies within the Department of Interior (BLM and National Park Service). Several units are split in two by a road as is the case with East and West Beauchamp Creek (road 201). Another unit (East Hell Creek) has a road leading to a private inholding. However, conditions have not changed in any of the units since they were proposed as wilderness in 1974, and measurable negative effects have not been documented. The presence of a road is not justification for eliminating the unit. Furthermore, because the proposed wilderness units were transmitted to Congress by the President in 1974, any recommendation that came out of the CCP process could not be carried out until Congress acted on the original proposals. This would cause confusion; therefore, the reduction of any unit was not carried forward in the final CCP and EIS.

## 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, fire districts, weed districts, and sheriffs departments
- nongovernmental organizations including Rocky Mountain Elk Foundation, World Wildlife Fund, American Prairie Reserve, 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).

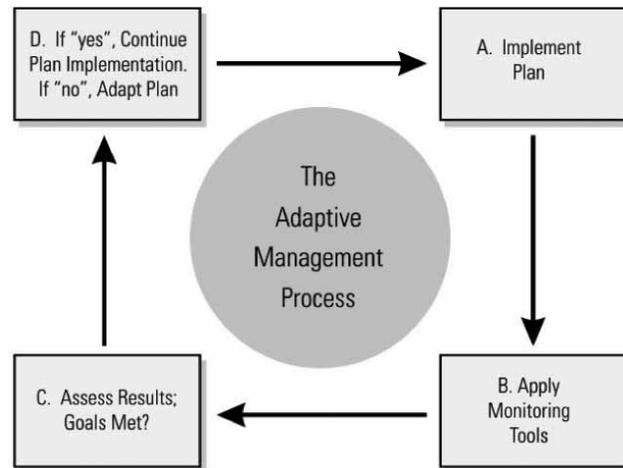


Figure 11. Adaptive management process.

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 find out 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.

## 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 stepdown 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 6 identifies the step-down plans needed to fully implement the CCP.

**Table 6. Stepdown 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 hunting and fishing fishing and mussels wildlife observation, photography, and interpretation environmental education	2017
Transportation	2017
Wilderness stewardship	2015

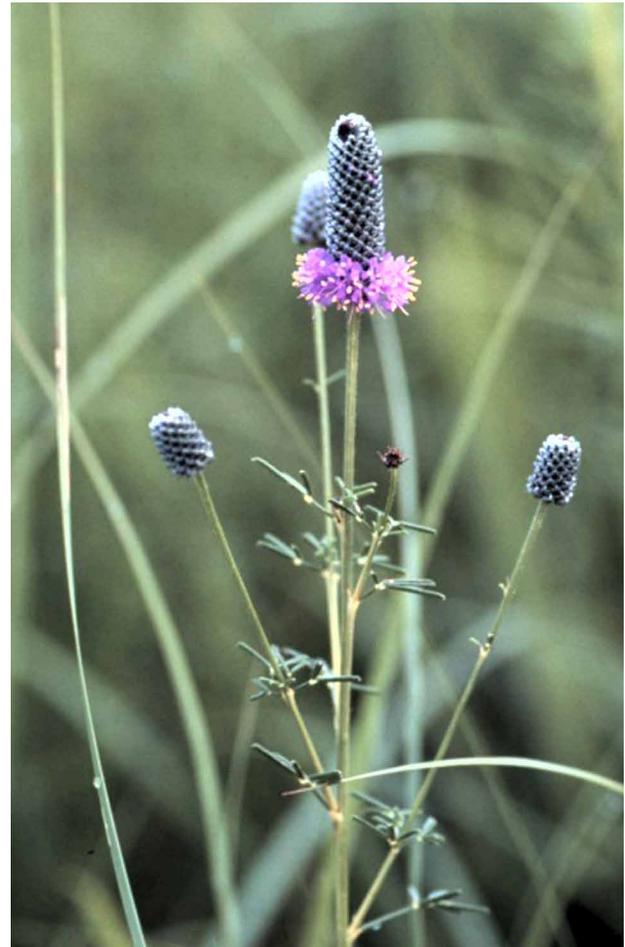
\**Depends on the preferred alternative selected for the CCP.*

### 3.14 FUNDING and PERSONNEL

Refuge budgets generally include ongoing operations funds for personnel, maintenance, and utility needs. Table 7 summarizes the estimated costs for the alternatives over 15 years, and table 8 displays the details used to develop the costs.

Table 9 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 money 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.



*Purple Prairieclover*

Larry Allain / USDA-NRCS PLANTS Database

**Table 7. 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 8. 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>			
	Alternative A	Alternative B	Alternative C	Alternative D
HABITAT: uplands	317	500	626	598
river bottoms	420	494	350	490
riparian areas and wetlands	150	213	71	258
shorelines	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
American 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, and 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 and maintenance	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 9. 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>
<i>Headquarters (Lewistown, Montana)</i>			
Project leader GS*-14	Project leader GS-14	Project leader GS-14	Project leader GS-14
Deputy project leader GS-13			
Pilot and 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
<i>Fort Peck Field Station</i>			
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 9. 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>
<b>Jordan Field Station</b>			
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
<b>Sand Creek Field Station</b>			
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-11	Assistant fire management officer GS-11	Assistant fire management officer GS-11
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
<b>UL Bend National Wildlife Refuge</b>			
—	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
<b>Seasonal Employees</b>			
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>
1 Fire seasonals GS-3	<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 10 is a summarized, side-by-side look at the actions for each alternative. An analysis of these actions is in “Chapter 4—Environmental Consequences”; a summary of the expected consequences of the alternatives is in table 56 at the end of chapter 5.



**Table 10. Comparison of actions for the CCP alternatives for the 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 (preferred alternative)
<p><b>Goal for habitat and wildlife management:</b> 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 in a changing climate. 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.</p>			
<p><b>Goal for threatened and endangered species and species of concern:</b> 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.</p>			
<p><b>Goal for research and science:</b> Advance the understanding of natural resources, ecological processes, and the effectiveness of management actions in a changing climate in the northern Great Plains through compatible scientific investigations, monitoring, and applied research.</p>			
<p><b>Goal for fire management:</b> Manage wildland fire using a management response that promotes fire's natural role in shaping the landscape while protecting values at risk.</p>			
<i>Habitat—upland</i>			
<p>Keep the 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.</p>	<p>Manage for a diverse plant community of highly productive wildlife food and cover plants emphasizing target and focal species.</p> <p>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).</p> <p>Within 3 years, develop new HMPs based on field station boundaries and evaluation of needs of target species.</p> <p>Evaluate success through monitoring of residual cover, sentinel plants, and other measures.</p> <p>Use more intensive manipulation to remove junipers for protection of existing trees from wildfire.</p>	<p>Similar to A, except:</p> <p>Manage the present habitat units for improving range conditions for domestic and wild ungulates using NRCS ecological site conditions and guidelines.</p> <p>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.</p> <p>Within 7 years, develop new HMPs based on soil characteristics, historical fire occurrence, grazing, and field station boundaries.</p> <p>Include fencing for better livestock distribution, water development, rotational grazing, and other management techniques designed to improve range conditions.</p> <p>In cooperation with NRCS, conduct ecological site evaluations on habitat units, monitoring residual cover and sentinel plant species. Continue current monitoring of residual cover.</p>	<p>Promote ecological resilience (where the land can absorb disturbance and still keep 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.</p> <p>Mimic and restore natural processes and manage for diversity of plant species within the community.</p> <p>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.</p> <p>Mimic ecological processes using fire and herbivory (grazing) by wild ungulates or livestock, or both, as prescribed to maintain plant diversity.</p> <p>Sustain viable populations of plant species that are first to decline when management practices are injurious (sentinel species).</p>

**Table 10. Comparison of actions for the CCP alternatives for the 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 (preferred alternative)
<i>Habitat—upland (continued)</i>			
			<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>
<i>Habitat—river bottom</i>			
Restore small acreages of bottomlands when money allows.	<p>Develop and apply 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>	More aggressive timeframe for restoration of river bottoms than C. More emphasis on native plant restoration (no food plots).
<i>Habitat—riparian area and wetland</i>			
Maintain the current stream riparian habitat through a fire suppression program, big game emphasis, and livestock grazing, fences, and water development.	<p>Resurvey the health of streams.</p> <p>Resurvey streams and riparian areas (85% of the 82 miles of stream and 1,300 acres of riparian areas would improve to next category using ESG Lotic Wetland Health Assessment Survey, and at least 95% from 2009 survey are maintained as “healthy”).</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>Figure out if other stock ponds are needed to meet needs for target and focal 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>Restore streams and riparian areas (60% of the 82 miles of stream and 1,300 acres of riparian areas would improve to next category using ESG Lotic Wetland Health Assessment Survey, and at least 85% from 2009 survey are maintained as “healthy”).</p> <p>Within 10 years, evaluate current stock ponds and figure out which ponds need to be rehabilitated or are needed to meet grazing needs.</p> <p>Within 5 years, determine the potential of and prioritize selected sites for streambank stabilization. Stop hoof bank-shearing.</p> <p>Over 15 years on priority streams, restore using a variety of methods that improve water quality and quantity, stabilize streambanks, and improve channeling.</p>	<p>Similar to B and C, except:</p> <p>Restore streams and riparian areas (75% of the 82 miles of stream and 1,300 acres of riparian areas would improve to next category using ESG Lotic Wetland Health Assessment Survey, and at least 90% from 2009 survey are maintained as “healthy”).</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> <p>Over 15 years, restore natural hydrology to five first-, second-, and third-order streams that would normally flow into the Missouri or Musselshell Rivers.</p>

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<i>Habitat—riparian area and wetland (continued)</i>			
	<p>Identify and rank river-banks in need of stabilization 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>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 onsite hydrology and restore dynamic hydrological processes where possible.</p>
<i>Habitat—shoreline</i>			
<p>Continue to combat invasive plants (mostly saltcedar). If Fort Peck Lake levels rise to historical levels, revisit treatment of shoreline areas.</p>	<p>Increase efforts to combat invasive plants through partnerships. 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>
<i>Habitat—invasive species</i>			
<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 the active bottomland restoration program.</p> <p>Continue partnerships 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 &gt;3,000 acres.</p> <p>Consider crop rotation in bottomlands.</p> <p>Continue cooperative effort with USACE on saltcedar removal.</p> <p>Emphasize visitor education about weeds and aquatic invasives (for example, zebra mussels) and increase public awareness and enforcement.</p> <p>Consider added 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, except:</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>
<i>Habitat—water resources</i>			
<p>Continue restoring riparian habitat and adhere to standard watershed management practices as money allows.</p> <p>Continue working with USGS and the State on water quality studies and standards.</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>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>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>

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<i>Habitat—water resources (continued)</i>			
Maintain and rehabilitate select stock ponds.  Continue to cap artesian wells to prevent depletion of ground water. (Same as B, C, and D.)	Keep ground cover to increase ground waterflow into streams, and reduce runoff and soil erosion and protect riparian area corridors.  Encourage natural water development within streams such as increased flow, pools, beaver ponds, and artificial water such as dugouts to benefit wildlife populations.  Evaluate stock dam needs especially in high-functioning watersheds to determine cumulative impacts on streamflow fish and riparian conditions.  Evaluate current and future water development on a site-specific basis and consider effects (positive and negative to all resources).	Keep ground cover across refuge to increase ground waterflow into streams, and reduce runoff and soil erosion and protect riparian area corridors. (Same as B.)  Encourage natural and constructed water sources for livestock and public fishing and hunting opportunity.  Evaluate current and future water development on a site-specific basis and consider effects (positive and negative) to all resources.	Keep ground cover across refuge to increase ground waterflow into streams, and reduce runoff and soil erosion and protect riparian area corridors. (Same as B.)  Reference riparian area research and publication for guidance on restoring or improving water quality in identified areas.  Assess the needs of current reservoirs and restore historical hydrologic condition of reservoirs no longer needed for livestock or wildlife.  Maintain and rehabilitate select stock ponds.
<i>Habitat—water rights</i>			
Adjudicate, define, and quantify water rights.	Same as A, plus:  Pursue water rights associated with buying inholdings. Obtain senior upstream water rights only when approached by landowner or current water right holder.	Same as B.	Same as B.
<i>Habitat—grazing</i>			
Continue to manage 65 habitat units with livestock (1986 EIS). (In 2009, 55 units have active permits.)  Retire livestock grazing permits as they become available (i.e., ranch changes ownership, but this would not include generational transfer).  Maintain fencing.  Gradually move toward prescriptive grazing to manage grazing (defined as use of specific, written directions to achieve a desired outcome) as units become available, or habitat evaluations are completed, and action is necessary to meet wildlife or habitat objectives. Over 15 years, apply prescriptive grazing on at least 50% of the refuge.	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.  Remove livestock grazing from all habitat units that are fenced separately from surrounding lands. Use only prescriptive grazing.  Within 4–7 years, prescriptive grazing would be developed for 50–75% of the refuge.  Remove interior fencing where appropriate. Fence boundary to exclude common pastures and allow the Service to affect management treatments to meet wildlife objectives.	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).  Up to 50% of the refuge would be under prescriptive grazing.  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.  Consider designating administrative use-only roads for livestock management where appropriate and allowed by policy and laws.	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; more conversion to prescriptive grazing would be ongoing.  If monitoring reveals prescribed habitat objectives are not met due to livestock grazing, make prescription changes (including stocking density, duration, season, AUM reduction, and retiring the permit).  Remove interior fences to facilitate long-distance animal movements and use of prescribed fire. Fence boundary.  Allow generational transfer under a prescriptive program.

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<b>Habitat—prescribed fire</b>			
<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 hazardous 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>
<b>Habitat—wildfire</b>			
<p>Continue fire suppression using a management response strategy that evaluates the response to a wildfire based on several 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.</p> <p>Increase prescriptive grazing to minimize the fuel load.</p>	<p>Similar to B, except:</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>
<b>Habitat—climate change</b>			
<p>Continue current efforts to reduce the carbon footprint including maintaining a small 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>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 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>Same as B.</p>	<p>Same as B.</p>

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<i>Habitat—climate change (continued)</i>			
	<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.</p> <p>Upgrade offices to “green” standards. Install solar panels and carefully sited wind turbines. Provide recycling bins. Encourage teleconferencing instead of driving, turning off lights, recycling, and turning down heat.</p>		
<i>Wildlife—birds</i>			
<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, and turkey.</p> <p>Improve waterfowl habitat on all suitable ponds.</p> <p>Maintain two peregrine falcon eyries.</p>	<p>Within 7 years, complete a bird atlas (collection of data) of the refuge to determine existing composition, distribution, and relative abundance of breeding, non-breeding, resident, and migratory birds using the refuge. Within 8–15 years, repeat the effort, and establish a refugewide monitoring program that describes the sentinel plant associations and habitat needs of 75% of the highest priority focal bird species.</p>	<p>Similar to B, except establish a monitoring program for 50% of focal bird species. Specifically, look at greater sage-grouse and sharp-tailed grouse distribution and how they are affected by habitat objectives.</p>	<p>Similar to B, except establish a monitoring program for 90% of focal bird species.</p>
<i>Wildlife—threatened and endangered species and species of concern</i>			
<p>Continue to inventory and monitor threatened and endangered species and carry out recovery plans. Listed species include black-footed ferret, least tern, pallid sturgeon, and piping plover. The grizzly bear is a listed species that occurs in Montana, but is not 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>Continue surveying and conservation efforts for other species of concern: greater sage-grouse (candidate), Sprague’s pipit (candidate), mountain plover, swift fox, prairie dog, and other rare species.</p>	<p>Same as A, plus:</p> <p>Actively manipulate habitats to promote the recovery of threatened and endangered species. In critical habitat for select threatened and endangered species, ensure listed species are given highest priority.</p> <p>Develop management plans for grizzly bear in accordance with Federal and State regulations and plans for management of this 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 and 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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<i>Wildlife—furbearers and small predators</i>			
<p>Continue to allow coyote hunting at the start of pronghorn season through March 1.</p> <p>Maintain active predator management by USDA 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>End active predator management by USDA.</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>End active predator management by USDA.</p>
<i>Wildlife—big game</i>			
<p>Improve and 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 and 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, conduct 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>
<i>Wildlife—other wildlife</i>			
<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. Rank 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>

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<i>Wildlife—reintroductions</i>			
No new reintroductions. Past reintroductions of black-footed ferrets, prairie dogs, bighorn sheep, and elk (1950s). Turkeys reintroduced by MFWP adjacent to the refuge.	Cooperate with partners on potential reintroductions of black-footed ferret, swift fox, pallid sturgeon, bighorn sheep, and prairie dog (if necessary due to plague).  Cooperate with State and partners on the potential reintroduction of wild bison as wildlife in the landscape.	Cooperate with partners on the reintroduction of and expansion of the bighorn sheep population for expanded hunting.  Consider no other reintroductions.	Cooperate with partners to restore the biological integrity and ecological processes of the site where practical for reintroduction of extirpated species.  Cooperate with the State to consider species reintroductions when the landscape has been prepared and accepted by the public.
<b>Goal for public use and education:</b> 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 the refuge.			
<i>Public use—hunting</i>			
Maintain current hunting programs, which includes ungulates, upland birds, and waterfowl is currently allowed. Maintain a limited coyote season.  Shooting of nongame species is not allowed. Trapping is not allowed. Protect all other wildlife.	Work with MFWP to provide quality hunting opportunities that maintain sustainable populations of big game and habitat for nongame species.	Work with MFWP to provide maximum hunting opportunities and expand the following: —hunting programs to include new species and traditional and niche (primitive weapon) —hunts for young people —mule deer season —predator hunting and allow for trapping	Work with MFWP to provide hunting opportunities that keep big game and other species at levels that restore biological diversity and integrity, and environmental health.  Consider a limited predator hunting and trapping program.
<i>Public use—fishing</i>			
Continue to follow State regulations.  Continue cooperation with MFWP to regulate paddle-fishing.	Provide opportunities for quality fishing that maintains sustainable populations of game and nongame fish.	Provide increased fishing access to areas not accessible due to the changing lake level.  Consider permitting vehicular shoreline access to ice fishing in the winter.  Stock select livestock reservoirs to create more fishing opportunities.  Increase participation by youth and fishing groups.	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.
<i>Public use—wildlife observation, photography, and interpretation</i>			
Maintain elk-viewing areas, trails, the auto tour route, and other facilities that provide opportunities for wildlife observation, photography and interpretation to support 40,000 visits.	In 5 years, develop and complete visitor services plan and visitor experience survey.  Hire one outdoor recreation planner.  Over 15 years, increase participation in nonconsumptive uses by 5–10% annually (2,000–4,000 more visits).	In 5 years, develop a visitor services plan and conduct a visitor experience survey.  Hire two outdoor recreation planners.  Over 15 years, increase participation in nonconsumptive uses by 20–50% annually (8,000–20,000 more visits).	In 5 years, develop and complete a visitor services plan and conduct a visitor experience survey.  Hire two outdoor recreation planners.  Over 15 years, increase participation in nonconsumptive uses by 15–25% (6,000–10,000) more visits.

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<i>Public use—wildlife observation, photography, and interpretation (continued)</i>			
	<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, and prairie dog).</p> <p>Update existing signage, Web site and other interpretive media and facilities as needed. (Same as C and D.)</p>	<p>Over 15 years, increase the quality and number of facilities and programming by 5–15% over alternative A. Develop new facilities (trails, viewing blinds, interpretive center at Sand Creek) 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 the quality and number of facilities and programming by 10% over alternative A (Sand Arroyo trail, viewing blinds, and science and interpretive center). 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>
<i>Public use—environmental education</i>			
<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 more 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>
<i>Public use—opportunities for visitors with disabilities</i>			
<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:</p> <p>Adaptively manage wildlife-dependent recreation opportunities to meet the needs of visitors with disabilities.</p>	<p>Same as B, plus:</p> <p>Collaborate with other agencies to increase accessibility for wildlife recreation. Provide more accessible facilities.</p>	<p>Same as B, plus:</p> <p>Upgrade existing facilities to meet current standards for accessibility and increase accessibility where appropriate.</p> <p>Adaptively manage for an aging hunting population such as providing game retrieval roads on northeast side.</p>
<i>Public use—other activities in support of priority public uses</i>			
<p>Continue allowing the following uses: —horseback riding throughout the refuge and ATV use on public roads within the refuge —bicycling on numbered roads, which include seasonally closed roads —permit public planes to land only on water or ice determined by USACE’s plan</p>	<p>Same as A, except:</p> <p>Use adaptive management as various uses increase.</p> <p>Disallow new secondary recreational uses unless it facilitates a wildlife-dependent recreational use.</p>	<p>Same as A, except:</p> <p>Use adaptive management as various uses increase.</p>	<p>Same as C.</p>

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<i>Public use—access</i>			
<p>Maintain existing refuge roads (670 miles). (Alternative A only)</p> <p>Keep roads closed in the proposed and designated wilderness.</p> <p>Continue the limited seasonal closure of roads when necessary.</p> <p>Continue to work with USACE on management of boat ramps. Rock Creek is only boat ramp under Service jurisdiction.</p> <p>Develop a travel management plan (stepdown plan) in cooperation with partners to ensure secured public access.</p> <p>Allow current access to private inholdings to continue.</p>	<p>Similar to A, except or plus:</p> <p>Reduce some existing roads to benefit wildlife populations.</p> <p>Close 106 miles of road to meet habitat objectives, manage roads and access to promote more harvest opportunities and larger wildlife populations.</p> <p>Promote nonmotorized access, but consider allowing motorized access on existing roads for retrieval only.</p> <p>Restrict access on a seasonal basis to sensitive areas by river and road. Monitor ATV use on numbered trails and manage if documented disturbance issues (both wildlife and visitor use).</p> <p>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.</p>	<p>Similar to A, except or plus:</p> <p>Manage access to benefit public and economic use.</p> <p>Consider expanding or improving access in some areas and seasonally closing areas if needed to protect wildlife and habitat.</p> <p>Improve about 16 miles of roads to all-weather access (gravel) along Knox Ridge road and road 108 (north-east side) to provide a loop.</p> <p>Consider winter fishing access for Elk Hole or Big Swirl.</p> <p>Improve access to boat ramps.</p> <p>Promote nonmotorized access, but consider allowing motorized access on existing roads for retrieval only.</p> <p>Work within existing policies to allow livestock permittees to manage infrastructure and stock within habitat units.</p> <p>Evaluate creating trails that are open for bicycle use.</p>	<p>Similar to A, except or plus:</p> <p>Manage access to benefit natural processes and habitat.</p> <p>Close about 21 miles of road; seasonally close road 315; designate 13 miles on north-east side as game retrieval roads (closed during hunting season except to retrieve game); gravel 5 miles along Knox Ridge road; allow for additional winter fishing access from the southwest side; and fully evaluate all roads and make further modifications as necessary to achieve habitat and wildlife objectives.</p> <p>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.</p> <p>Monitor ATV use on numbered trails and manage if document disturbance issues (both wildlife and visitor use).</p> <p>Continue to restrict bicycles to numbered roads only including seasonally closed roads.</p>
<i>Public use—recreation sites</i>			
<p>Continue allowing camping within 100 yards of roads.</p>	<p>Same as A, except:</p> <p>Use adaptive management as use increases.</p> <p>Manage vehicular camping to fit the use (i.e., paddling and concentrated camping versus big game hunting and dispersed camping) and ensure protection of surrounding habitat.</p> <p>Permit backcountry camping.</p>	<p>Same as A, except:</p> <p>Use adaptive management as use increases.</p> <p>Establish new campsites and campgrounds. Look to create designated horse camps and evaluate the need for designating campsites along the lake to meet increased demand and lessen the negative effect on shoreline habitat.</p>	<p>Same as A, except:</p> <p>Use adaptive management as use increases.</p> <p>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 negative effects on habitat). Limit camping to within 100 yards of numbered routes.</p>

**Table 10. Comparison of actions for the CCP alternatives for the 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 (preferred alternative)
<i>Public use—commercial recreation</i>			
<p>Continue to offer 11 outfitting permits for hunting. Commercial outfitting for coyote hunting is illegal.</p>	<p>Permit commercial recreation when it benefits fish and wildlife populations. Develop more commercial backcountry outfitting permits for hunting that accomplish habitat and wildlife objectives.</p>	<p>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 negatively affect public hunting.</p>	<p>Only permit commercial recreation when it benefits natural ecological processes or habitats (for example, allow commercial activities in roadless areas that facilitate big game harvest to meet wildlife or habitat objectives).</p>
<p><b>Goal for Wilderness:</b> Conserve, improve, and promote the wilderness character and associated natural processes of designated and proposed wilderness areas and wilderness study areas within the refuge for all generations.</p>			
<i>Wilderness</i>			
<p>Manage UL Bend Wilderness as a class 1 air shed. Within 2 years, submit a final report on the wilderness study to Washington. Follow Service policy to manage proposed wilderness.</p>	<p>Same as A, except: Over 15 years and on approval by the Department of the Interior, expand or adjust proposed wilderness units totaling about 25,869 acres.</p>	<p>Manage UL Bend Wilderness as a class 1 air shed. Within 2 years, submit a final report on the wilderness study to Washington. Follow Service policy to manage proposed wilderness.</p>	<p>Same as A, except: Over 15 years and on approval by the Department of the Interior, expand or adjust proposed wilderness units totaling about 19,942 acres.</p>
<p><b>Goal for Cultural and Paleontological Resources:</b> Identify, value, and preserve the significant paleontological and cultural resources of the refuge to connect refuge staff, visitors, and the community to the area's prehistoric and historic past.</p>			
<i>Cultural resources</i>			
<p>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. Protect known gravesites. Maintain road closures through sensitive cultural resource areas. Maintain the cultural resource inventory. Provide a brochure about the prehistory and history of the refuge.</p>	<p>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. Complete a comprehensive cultural resources overview. Identify potential preservation projects, and work with partners to find funding and implement. Locate and properly curate collections. Develop more interpretation materials.</p>	<p>Same as B, plus: Increase opportunities for ecotourism (nonconsumptive) through tours of historic sites. Develop brochures and kiosks that interpret cultural resources. Use more interpretive signs (would not identify specific archaeological resources). Collaborate with others to identify or stabilize resources.</p>	<p>Same as B.</p>
<i>Paleontological resources</i>			
<p>Continue to issue permits to professional paleontologists for the collection, curation, and study of the resources. Continue to prohibit recreational digging.</p>	<p>Same as A, except: Work with professional paleontologists to develop a step-down plan for the identification, study, and protection of resources. Increase protection and law enforcement.</p>	<p>Same as A, plus: Promote the creation of documentaries and increase educational opportunities. Consider buying inholdings for protection.</p>	<p>Same as A, except: Limit or manage special use permits to protect resources.</p>

**Table 10. Comparison of actions for the CCP alternatives for the 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 (preferred alternative)
<p><b>Goal for Refuge Operations and Partnerships:</b> 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>			
<i>Refuge operations</i>			
<p><i>Personnel:</i> Keep current personnel levels.</p> <p><i>Equipment and facilities:</i> Maintain the current number of facilities and equipment.</p> <p><i>Minerals:</i> Continue mineral withdrawal until 2013 and work to renew withdrawal.</p>	<p>Same as A, plus:</p> <p><i>Personnel:</i> 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><i>Equipment and facilities:</i> Same as A.</p> <p><i>Minerals:</i> Same as A, plus seek permanent withdrawal of all minerals including oil and gas and other leasable and locatable minerals on all refuge lands and future acquisitions.</p>	<p>Same as A, plus:</p> <p><i>Personnel:</i> Increase personnel by adding an outdoor recreation planner at Fort Peck and Lewistown Field Stations, 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><i>Equipment and facilities:</i> Expand facilities at Jordan Field Station and more office space at Jordan and Sand Creek Field Stations.</p> <p><i>Minerals:</i> Same as B.</p>	<p>Same as A, plus:</p> <p><i>Personnel:</i> Same as C.</p> <p><i>Equipment and facilities:</i> Same as C.</p> <p><i>Minerals:</i> Same as B.</p>
<i>Partnerships—land management</i>			
<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, wild 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 effects of management actions that affect landscapes within and outside refuge boundaries.</p> <p>Look for opportunities to exchange, consolidate and 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 conservation incentives to benefit species diversity and ecological integrity.</p>
<i>Partnerships—collaboration</i>			
<p>Maintain existing partnerships as described in chapter 3:</p> <ul style="list-style-type: none"> <li>—Federal agencies</li> <li>—MFWP and DNRC on wildlife and habitat management and other State agencies</li> </ul>	<p>Same as A, plus:</p> <p>Revisit partnerships and adapt as needed based on new management direction.</p> <p>Work with USACE on lands that could be transferred to the Service for primary jurisdiction.</p>	<p>Same as B, plus:</p> <p>Develop partnerships with the chamber of commerce and State tourism board.</p> <p>Work with these and other partners to highlight refuge resources through promotional materials. Work with nongovernmental organizations interested in developing ecotourism opportunities.</p>	<p>Same as C, plus:</p> <p>Revisit partnerships and adapt as needed based on new management direction.</p> <p>Work with USACE on lands that could be transferred to the Service for primary jurisdiction.</p>

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<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 (preferred alternative)
<i>Partnerships—collaboration (continued)</i>			
<p>—Conservation districts, county commissioners, fire wardens, weed districts, fire districts, and sheriff departments</p> <p>—Nongovernmental organizations</p> <p>—Adjacent private landowners and local communities</p> <p>Continue to work with partners to promote the refuge as an ecotourism destination.</p>	<p>Pursue more opportunities for joint management of fire suppression, prescribed fire, and habitat manipulation.</p> <p>Develop a road management plan (Federal, State, and county).</p> <p>Look for more partnerships and money to support increased invasive species control.</p> <p>Develop a Friends group.</p>	<p>Develop more partnerships with various sporting organizations that would support public uses (such as Mule Deer Foundation).</p> <p>Explore more 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>Pursue more opportunities for joint management of fire suppression, prescribed fire, and habitat manipulation.</p> <p>Look for more partnerships and money for increased invasive species control.</p> <p>Work with these and other partners to highlight refuge resources through promotional materials.</p> <p>Develop a Friends group and expand volunteer opportunities.</p>

