chapter 4

MANAGEMENT DIRECTION

Chapter 4. Management Direction

This chapter describes the direction of refuge management over the 15 year life of the CCP. The focus of both wildlife and habitat management and public use management are summarized followed by a detailed description of the objectives and strategies for achieving each of the refuge goals.

4.1. WILDLIFE AND HABITAT AND PUBLIC USE MANAGEMENT DESCRIPTIONS

With many miles of trail, thousands of acres of grassland habitat and a beautiful mountain backdrop, the Refuge could become a popular destination for wildlife enthusiasts, naturalists and students within the Denver metropolitan area. The visitor experience at the Refuge will be characterized by the Service's commitment to providing visitors with an understanding and appreciation of the flora and fauna of the prairie ecosystem. The Service's efforts to connect visitors to their natural resource heritage will build upon regional efforts to promote an appreciation for the grassland environments.

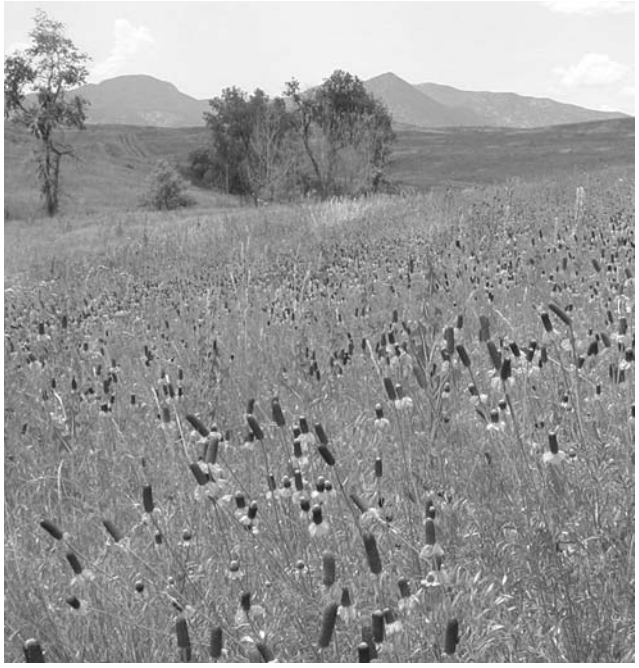
Given the current cleanup of the Rocky Flats Environmental Technology Site and the Service's commitment to habitat conservation and enhancement, the Refuge will provide an excellent opportunity to educate the public about the processes of grassland restoration and to actively involve them in the rehabilitation of the landscape.

Wildlife and Habitat Management

Preble's Habitat Management

Riparian and wetland communities at the Refuge support habitat for a variety of wildlife species, including the threatened Preble's meadow jumping mouse. The Service will protect and maintain Preble's habitat throughout the Refuge. While meeting the Service's obligations under the Endangered Species Act, the protection of Preble's habitat also will serve other species that depend on riparian and wetland communities for survival.

The Service will also strive to improve habitat for the Preble's meadow jumping mouse (and other riparian species). Part of the riparian habitat enhancement efforts will be the removal and revegetation of unused roads and stream crossings. The Service will conduct surveys of Preble's habitat every 2 to 3 years to detect changes in size and location of existing populations. Surveys will include monitoring plant diversity in riparian areas. The Service will seek funding and partnerships to assist in monitoring the impacts of recreational use on Preble's and its habitat.



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Prairie coneflower in the mixed prairie grassland.

Xeric Tallgrass Management

The rare xeric tallgrass grassland community, which dominates the pediment tops in the western portion of the Refuge, is an important natural resource that needs special consideration and management. The Service will manage the xeric tallgrass to maintain the extent and improve the native species composition of this community. The Service will develop a vegetation management plan to direct management efforts (including herbicide application, biological controls, prescribed fire, grazing and mowing) and will monitor species composition and weed infestations every few years to ascertain the effectiveness of management efforts.

Mixed Grassland Prairie Management

Nearly half of the Refuge consists of mixed grassland prairie communities. While these communities are relatively common along the Colorado Front Range, they play an important role in providing habitat for various

wildlife species. Management strategies for the mixed grassland prairie include the use of prescribed fire and the use of managed grazing. In the southeast corner of the Refuge, a former agricultural field has been planted with non-native grasses. The Service will revegetate this and other disturbed areas with native grassland species that will improve the extent and diversity of grassland habitat. In all alternatives, additional management strategies will be implemented in the mixed grassland prairie communities according to the objectives and strategies outlined under weed management, prairie dog management, habitat restoration and species reintroduction.

Road Restoration and Revegetation

Rocky Flats currently has over 70 miles of roads, of which about 50 miles will be under Service jurisdiction. Roads and stream crossings that will not be used for maintenance access, fire control, trails, or other Refuge purposes will be removed and revegetated. The restoration effort will entail the removal and revegetation of 26 miles of road and13 stream crossings

Weed Management

Noxious weeds present a tremendous challenge to the health and diversity of native plants and wildlife habitat on the Refuge. The Service will control the spread and reduce the density of diffuse knapweed, Dalmatian toadflax and Canada thistle during the 15-year timeframe of the CCP.

Weed management scenarios will employ a comprehensive IPM approach, including the use of herbicides, biological controls, mechanical removal, prescribed fire and controlled grazing. Weed infestations will be mapped annually. Additional methods will include informal surveys along roads and trails and temporary fences to collect tumbleweeds which disperse seeds with the wind.

Deer and Elk Management

While the sizes and locations of deer and elk populations at the Refuge are well known, the carrying capacity of the habitat at the Refuge relative to population size has not been determined. The Service and/or CDOW will determine a target population for deer and elk on the Refuge and will seek to manage those levels. Tools to attain these population goals include culling by Service and/or CDOW staff and a limited public hunting program.

Managing deer and elk within target population levels for the Refuge will minimize the potential for overgrazing and overbrowsing of sensitive riparian habitat. The Service will monitor sensitive areas for such impacts.

Prairie Dog Management

The short and mixed grassland communities in the eastern portions of the Refuge provide up to 2,460 acres of habitat for black-tailed prairie dog. About 113 acres of prairie dog colonies were mapped at the Refuge in 2000. Due to recent plague outbreaks, about 10 of those acres are currently occupied. Prairie dog populations will be allowed to expand naturally within their primary habitat areas. Colonies will be limited to 750 acres. The Service, however, will not accept unwanted prairie dogs that are relocated from other jurisdictions.

Species Reintroduction

The task of restoring native species to the Refuge has already begun. In 2003, two native fish species that have been decreasing regionally were introduced into Rock Creek. Additionally, the CDOW, the City of Boulder, and Boulder County introduced a population of sharp-tailed grouse onto their open space properties north of the Refuge. The Service will continue to work with CDOW to facilitate species reintroduction at the Refuge. The Service will take active steps to evaluate the suitability of additional species reintroductions and to complete a management plan for sharp-tailed grouse reintroduction on the Refuge.

Public Use Management

The Refuge will be open to the public for a variety of uses. Three aspects of refuge management that will shape the visitor's Refuge experience are public outreach, interpretation, and public use activities and facilities. These components of refuge management are described to illustrate how a visitor would experience the Refuge.

The public outreach component describes methods used to educate the potential visitor about the Refuge, pique their interest, and recruit them to participate in public use programs. The interpretation component identifies critical stories to be told and the natural and cultural resources that will become the basis for educational and interpretive activities. How visitors access the site, what activities they enjoy, where they travel and what facilities they encounter are outlined in the public use activities and facilities component.

Public Outreach

Improving public perception of the Refuge by informing visitors about the site's natural resources and addressing safety concerns is essential to the development of successful public use programs. Past concerns about contamination, radiation exposure and other environmental risks have fostered apprehension about

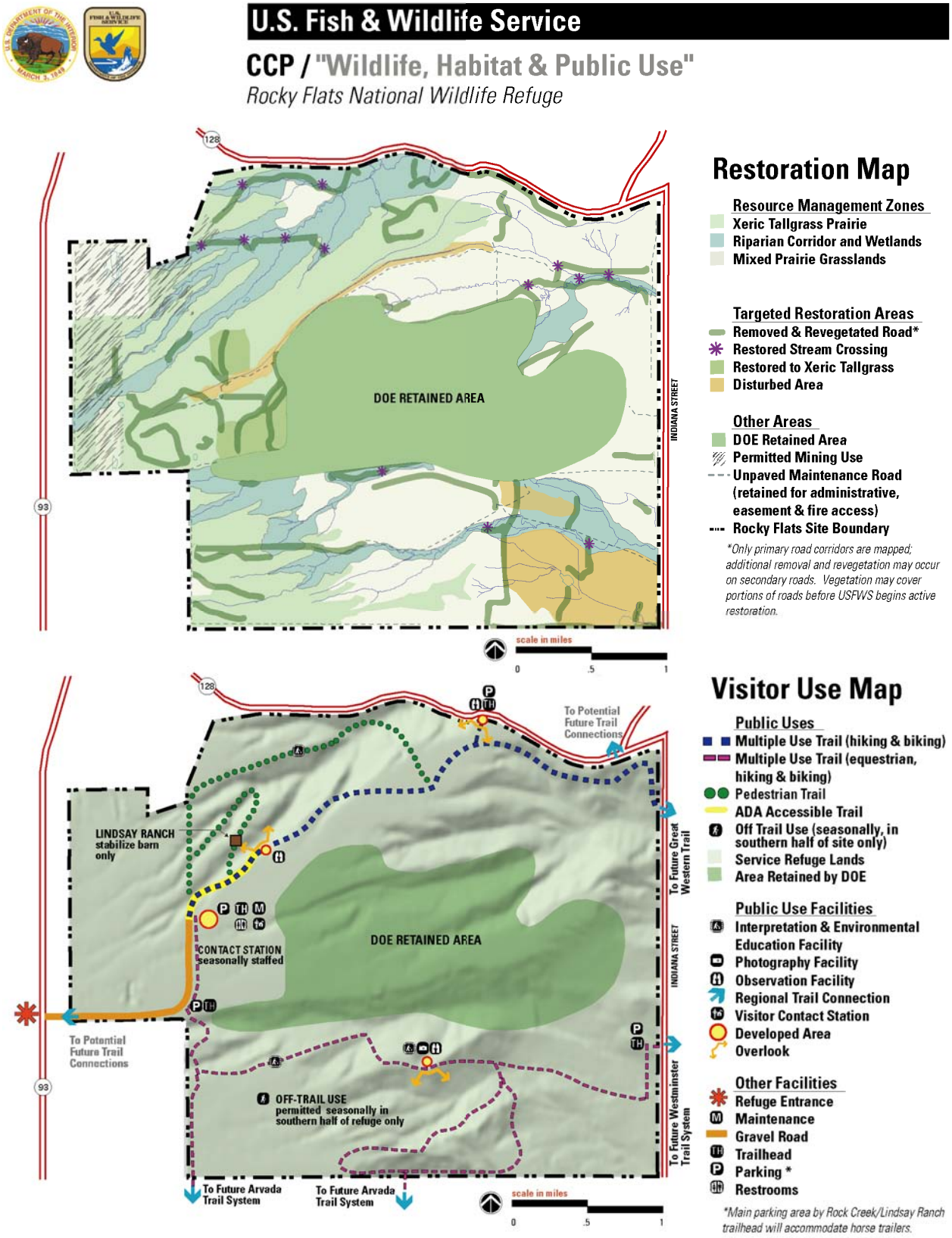

Figure 17. Comprehensive Conservation Plan

visiting the Refuge. The Rocky Flats site has been closed to the general public for over 50 years and the lack of access opportunities has also contributed to fearful speculation about the site's condition.

In an effort to assuage public safety concerns, the Service will develop public outreach programs and attempt to build a stronger base of public understanding, support and stewardship within the Denver metropolitan area through a variety of outreach methods.

Communication

The "Open and Effective Communication" goal (described in Chapter 1) is driven by the Service's commitment to provide the public with clear information about the safety of the site, instill confidence in the Service's ability to provide safe visitor experiences and to develop community support for the Service's programs and management policies. In response to the concerns raised during public scoping regarding the site's history and contamination, the Service sees the value in developing a communication goal to guide public outreach efforts. The goal clearly emphasizes the importance of educating the public about the Refuge, the Service and the NWRS.

The Service will develop of a variety of public outreach methods to inform the public about environmental stewardship, risk communication, CCP implementation, and the mission of the Service and the NWRS. For example, a visitor may learn about the Refuge and opportunities to visit the site through media coverage, newsletters and flyers, or by attending community events. To reach a broad range of people, the Service will coordinate with local partners to participate in community events and provide input on local environmental issues. The outreach efforts will be instituted during the first year of the Refuge's establishment and will be ongoing throughout the life of the CCP.

Interpretation

The goal of the interpretive programs at the Refuge is to inform the public about the Rocky Flats site, educate about resident wildlife and their habitats, and cultivate a stewardship ethic. Committed to fostering an appreciation of the Refuge's natural resources, the Service developed interpretive themes that focus on wildlife, wildlife habitat and the site's history. Providing the public with interpretive information and programs will enhance the public's understanding of their surrounding natural environment and increase support for the Service's habitat conservation efforts.

Interpretive Themes

Interpretive themes will provide a basis for the development of public use activities. The themes capture the essence and importance of ideas, concepts and features that emerged from the Service's review of the Refuge's natural and cultural resources.

The four themes represent the central messages that the Service wants to convey to visitors. The themes provide the foundation for all interpretive programming and facility development. Each theme is summarized by a simple statement and supported by several subthemes. Linked specifically to certain resources, the subthemes further define the stories about Refuge resources and the Service's role in transforming the site (Table 7).

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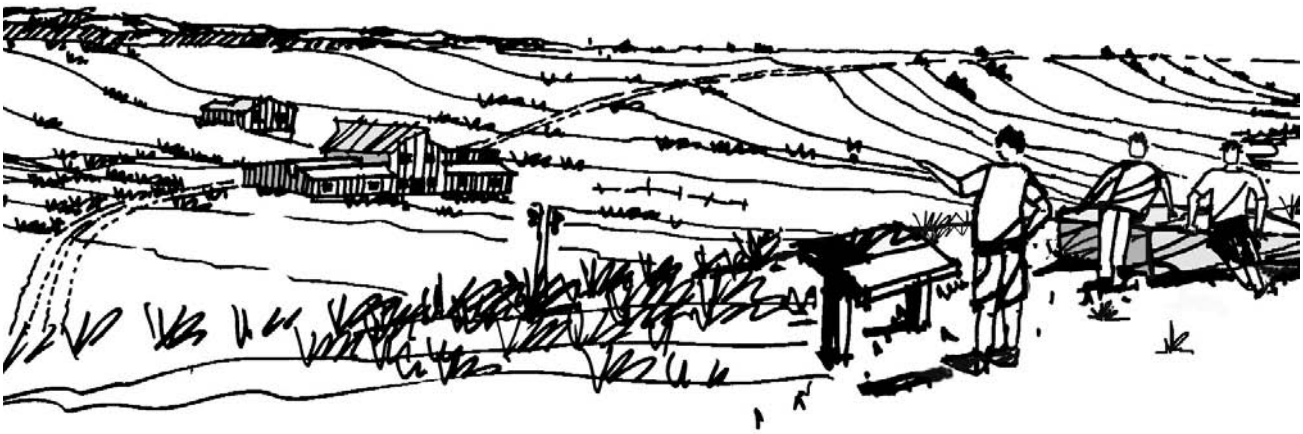

Interpretive panels at overlooks will provide information about the Refuge's natural and cultural resources, such as Rock Creek and the Lindsay Ranch.

Interpretive Facilities

A variety of facilities will be developed to help the visitor better understand the interpretive themes. The primary interpretive facilities will be signage, displays and a Refuge website.

Signage/Displays: Signs and displays varying in design will help illustrate the historical and natural stories of the Refuge. Listed below are the types of signage a visitor will find upon entering and exploring the Refuge:

- **Roadside and Boundary Signs:** Signage is needed to notify people of the Refuge's location and direct visitors to the Refuge. A refuge entrance sign will be placed outside the main entrance along Highway 93, and the exterior boundary will be posted with standard NWR boundary signs.
- **Interpretive Signs:** Located at all trailheads and in selected spots along trails, small signs will display a map and/or interpretive facts about a specific location or topic. Trailhead signs will include information about the site's history, clean up and access restrictions.
- **Interpretive Sign Panels:** Larger signs at the Rock Creek overlook, the contact station, and Lindsay Ranch will display interpretive information about the Refuge's resources and/or visitor orientation information.
- **Directional Signs:** Located at select trail intersections, signs will provide visitors direction and announce trail rules and regulations.
- **Visitor Kiosk:** Located outside the contact station, the kiosk will consist of three panels fastened to a wooden structure. The kiosk will provide orientation, regulatory and interpretative information for visitors entering the Refuge.
- **Interpretive Displays:** Permanent and changing displays that highlight the Refuge's natural resources will be showcased in the contact station.

Table 7. Interpretive Themes

Theme: *Habitat Restoration:* "Diverse wildlife populations require healthy plant communities."	
Subthemes: Explore the various types of habitat at the Refuge and promote visitors' awareness, understanding and appreciation of both the prairie ecosystem and the Service's restoration efforts.	*Plants for Wildlife:* Riparian and prairie plant communities including the rare xeric tallgrass and tall upland shrublands provide shelter and food for wildlife. *Battling Invasive Weeds:* Invasive weeds crowd native plants and degrade habitat at the Refuge and throughout the West. *Restoring the Prairie:* Restoring and maintaining the native prairie requires a variety of tools and techniques.
Theme: *Wildlife:* "Wildlife take refuge at Rocky Flats."	
Subthemes: Explore the relationships between habitat types and the kinds of wildlife they support.	*Home to Wildlife:* Refuge wildlife forage and nest in the grasslands, occupy the riparian areas and migrate to and from adjacent open space lands. *Threatened and Endangered Species:* Preble's meadow jumping mouse, a threatened species, resides in the riparian habitat found at the Refuge. *Returning to the Prairie:* Reintroducing prairie species to the Refuge boosts biodiversity and creates unique viewing opportunities.
Theme: *Wildlife and People:* "Wildlife comes first."	
Subthemes: Explore how wildlife and people co-exist and how both will benefit from habitat restoration and conservation.	*Watchable Wildlife:* Viewing wildlife in a natural setting. *Respecting Wildlife:* While an enjoyable activity, wildlife observation requires respect and consideration for wildlife.
Theme: *History:* "Native Americans, settlers and the DOE all used Rocky Flats. Today, it is protected for wildlife."	
Subthemes: Interpret the historical periods that have shaped the site and how generations have managed to survive in the harsh climactic conditions of the prairie landscape.	*Prehistoric Prairie Settlement:* Native American activity on the plains – describing settlements, hunting and day-to-day survival on the prairie. *Settling the Frontier:* Homesteading on the Great Plains and the establishment of the Lindsay Ranch. *Plutonium Trigger Production:* DOE's development and management of a nuclear weapons production site and the cold war history. The Service will work in collaboration with the Cold War Museum to tell the story of the site as a nuclear production site. *A Renewed Purpose:* DOE's cleanup and closure of the production site and the Service's ongoing efforts to restore and conserve the prairie in order to provide habitat for wildlife and wildlife-dependent public uses.

Website: A Refuge website will provide a reference resource for students and the general public to learn from their classroom and/or home computer fun facts about the Refuge as well as scientific data related to the grassland ecosystem and its wildlife. The website will serve several education levels.

Interpretive and Environmental Education Programs
Outlined below are general descriptions of the types of interactive and field-based interpretation and educational activities proposed for the Refuge. Directly tied to the interpretive themes, the programs will bolster environmental awareness and appreciation by highlighting the natural features and history of the Refuge. Refuge staff will develop and run the programs with the assistance of volunteers. Programs will be tailored to attract a diversity of visitors and the types of programs and their topics will change seasonally.

- **Guided Tours:** Refuge staff or a volunteer will lead interpretive walks that focus on wildlife, habitat needs, or the site's other natural and cultural resources. Tours will highlight unique characteristics of the site and identify the interrelationship between prairie plant communities and wildlife populations.
- **Nature Programs/Presentations:** Conducted either in the field, in surrounding communities, or in the contact station, presentations will offer an in-depth explanation of a specific topic. To the extent possible, Refuge volunteers and/or partners will lead these programs/presentations.
- **Hands-On Work:** Programs developed to recruit volunteer participation in prairie restoration may include seed collection, weed removal, or seeding. The work activities will include information sessions on restoration techniques and the benefits of restoring prairie habitat. Volunteers also may be involved with Refuge enhancement projects such as trail construction and general maintenance.
- **Teacher Resource Guides and Workshops:** Refuge staff will develop teacher resource guides that present the necessary information for teachers to conduct their own environmental education programs at the Refuge. The guides will meet Colorado's model content standards and will likely include pre-visit activities, on-site activities, post-visit activities and assessment activities. Additionally, the Service will sponsor teacher training workshops to familiarize local educators with the Refuge's resources.

Public Use Activities and Facilities

Although guided by a "Wildlife First" mission that promotes the "conservation, management and where appropriate, restoration of the fish, wildlife and plant resources and their habitats," the Refuge System is also committed to investing in public use facilities and programs that foster an appreciation of the Refuge's natural resources. By raising public awareness and understanding of the prairie habitat and wildlife, the Service hopes to cultivate a land stewardship ethic among visitors.

Access
Access to the site will be obtained via a two-lane road off of Highway 93. The access road will direct visitors to orientation information, trailheads and parking areas.

To tie into surrounding existing and proposed trail systems, additional trailheads will be built on the north, east and south boundaries of the Refuge. Strategically located to provide links to proposed trail networks, the secondary access points along the Refuge boundary will permit visitors to enter the site on foot, bike and in some cases by horse. The Refuge will remain open from sunrise to sunset.

Since visitors will be able to enter the site from a number of access points, each entry will serve as a "use portal" where signage will inform users about the distinction between where they came from (e.g., municipal open space) and where they are going (a National Wildlife Refuge). In addition to clarifying access opportunities and restrictions and information on the site's history and cleanup, the signage will inform visitors to the conservation practices and priorities that may differ from surrounding open space areas.

Wildlife-Dependent Public Uses
The Refuge will provide a spectrum of wildlife recreation opportunities ranging from guided tours, to hiking, to interactive interpretation programs. Visitors will explore and learn about the site independently with the aid of interpretive facilities including signage, kiosks and printed materials. Through the careful siting of trails and the design of visitor use facilities, it will be possible to shape the Refuge environment so that it invites exploration and reveals natural processes while minimizing impact to sensitive areas. Interpretive and educational programs will promote appreciation of the ecology of the prairie environment and inspire a greater appreciation for the Front Range's remaining grassland habitat. Dogs and other pets will not be permitted on the Refuge.

The visitor experience will include opportunities for the public to engage in hunting, wildlife observation, photography, interpretation and environmental education. The public use activities will be carefully managed to avoid harmful impacts to wildlife and their habitat. Because the Service will focus on restoration and facility development during the first 5 years of Refuge operation, most of these activities will not be instituted until the Refuge is fully open to the general public (by year 6).

- **Hunting:** A highly controlled youth and/or disabled hunting program will be held a few weekends a year. This program will allow youth and disabled individuals to hunt deer and elk with the assistance of Service staff (and Refuge partners) in a safe environment where they will have reasonable harvest opportunities. If necessary, the Service could consider expanding the hunting program to include the general public (depending on wildlife management needs). During special hunting weekends, the Refuge will be closed to all other visitors.
- **Wildlife Observation and Photography:** Trails, blinds and overlooks will provide numerous vantage points for observing wildlife. Naturalists, photographers and other wildlife enthusiasts will also enjoy opportunities to view and photograph wildlife off-trail (between October and May in areas south of Woman Creek).
- **Interpretation:** Upon entering the Refuge, visitors will find signage, maps and interpretive panels outside a visitor contact station. Interpretive and informational materials at trailheads, overlooks, and the contact station will educate visitors about specific site resources such as grassland restoration, early settlement of the prairie and wetland ecology.
- **Volunteers:** A volunteer program will be developed to provide support for Refuge staff. Volunteers will assist with orienting and educating visitors. Any visitor interested in learning more about the Refuge and, in turn, improving the Refuge experience for others will have the opportunity to volunteer.
- **Environmental Education:** Throughout the life of the CCP, the target audience for on- and off-site environmental education programs will be high school and college-level students. During the initial years of Refuge establishment (years 1 through 5), students will be encouraged to engage in research-oriented and independent study. Following year 5, guided tours and other nature programs will be designed to explore the site's natural and cultural resources and foster an understanding and lasting appreciation for the prairie environment.

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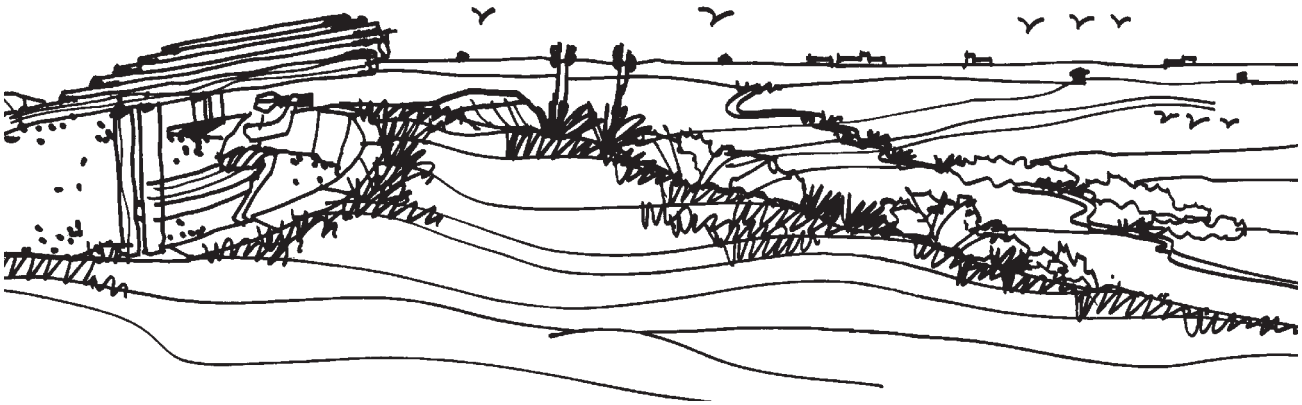

Viewing blinds will provide opportunities for wildlife observation and photography.

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Multi-use and pedestrian-only trails will accommodate a variety of trail users.

Other Public Uses

Visitors will have the opportunity to bike and ride horses on some of the Refuge's multi-use trails. Although biking and equestrian uses are not priority public uses, they will provide means for visitors to access the Refuge's interior to observe wildlife and explore the prairie landscape.

Biking will be allowed on all multi-use trails, but equestrian use will be limited to the multi-use trails in the southern half of the site. The southern multi-use trails will provide equestrians with links to adjacent trail systems in Westminster, Broomfield and Arvada.

Off-trail use will be permitted seasonally in the southern half of the Refuge. Off-trail use will provide visitors with increased opportunities to view wildlife and to explore the grasslands.

Facilities

Facility development will carefully balance opportunities for visitors to explore the prairie with habitat conservation. Facility development will include trails, trailheads (with portable restrooms) overlooks, information kiosks, viewing blinds, contact station (with restrooms) and parking areas.

For the first 5 years of Refuge establishment, the site will only be open to the general public at scheduled times and one trail (1.75 miles) to Lindsay Ranch will be open to pedestrians. The initial trail will extend from the parking area to the Rock Creek overlook and make a loop within the Rock Creek drainage.

Outlined below are all facilities that will be developed and open to the public 5 years after the Refuge is established:

- **Trails:** Approximately 12.8 miles of multi-use trails and 3.8 miles of pedestrian-only trails will be developed. The majority of the trails will follow converted road corridors away from riparian areas. Trails within the Rock Creek drainage and other sensitive areas will be subject to seasonal closures as needed to protect wildlife. Looped pedestrian-only and multi-use trails as well as connections to adjacent trail systems will accommodate a variety of trail users.

- **Kiosk:** Within a kiosk located outside the contact station, visitors will find maps of the trail system, rules and regulations, and information on Refuge wildlife and habitat. The kiosk will consist of three sign panels hung on a wooden structure. The kiosk will be accessible to all visitors when the contact station is closed. During the early years of refuge establishment when access is limited and before development of the contact station,

the kiosk will provide information on current and future public use opportunities.

- **Equestrian Uses:** Only multi-use trails in the southern portion of the site will be open to equestrian uses. Hitching posts will be located near the contact station, allowing equestrian users to hike to Lindsay Ranch.
- **Trailheads:** All entries to the Refuge trail system will be posted with signage that clearly demarcates the visitor's entry into a National Wildlife Refuge.
- **Overlook:** Three overlooks will provide views of the site and the outlying landscape. The overlooks will be simple and designed to fit into the prairie landscape. They will likely entail a graded, gravel area sited for its nearby and distant views. The Rock Creek and Highway 128 overlooks will feature interpretive sign panels. Benches at the Woman Creek and Rock Creek overlooks will provide a resting point for visitors.
- **Blinds:** Wildlife viewing blinds will be sited to optimize observation opportunities. The blinds will be designed to blend in with the surrounding landscape and minimize disturbances to wildlife.
- **Parking:** Four parking areas (spaces for about 54 cars and one bus) will be constructed. The largest parking lot (30 spaces) will be located at the entry drive terminus and adjacent to the contact station. This main parking area will be designed to accommodate horse trailers. An additional parking lot (20 spaces) will be situated on the site's northern edge with convenient access from Highway 128. Pull-offs along the main access road, south of the visitor contact station, and along Indiana Street will provide additional parking spaces (3 to 4 spaces each) for visitors using trails in the southern portion of the Refuge. All parking areas will be gravel and enclosed by a post and beam fence.
- **Restrooms:** Restrooms will be located near and/or within the visitor contact station.
- **Contact Station:** A small structure (approximately 750 to 1,000 square feet) will house an interpretive display and staff office space. The contact station will be the primary orientation point for visitors where they will collect information about the Refuge. The station also will serve as the meeting ground for guided tours and other Refuge programs. Located outside the main parking area, the contact station will be staffed seasonally (e.g., weekends from May through October), to provide visitor contact with Refuge staff.

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The Refuge could become a popular destination for wildlife enthusiasts, naturalists and students within the Denver metropolitan area.

4.2. OBJECTIVES AND STRATEGIES

The objectives and strategies are the specific actions that the Service will implement to achieve the goals of the Refuge. An objective is a general statement about what the Service wants to achieve on the Refuge, while a strategy is a specific action, tool, technique or combination of the above used to meet objectives. The objectives and strategies are arranged by the six goals discussed in Chapter 1. Several goals were subdivided into topics. For example, Goal 1 addresses wildlife and habitat management. Objectives and strategies within this goal were developed for species reintroduction, deer and elk management, prairie dog management and other topics.

Table 8 at the end of this chapter provides a detailed summary of all the objectives and strategies.

Goal 1. Wildlife and Habitat Management

Conserve, restore and sustain biological diversity of the native flora and fauna of the mountain/prairie interface with particular consideration given to threatened and endangered species.

The Refuge supports about 250 species of wildlife and several rare or sensitive plant communities. While some of these species and communities have specific management requirements that are directly addressed in the following objectives, there are many others that are not specifically addressed. These include animals such as the short-horned lizard and red-tailed hawk and rare plants such as the tall upland shrubland community and forktip three awn. The Service will address these species and communities by focusing on sustaining and improving the habitat conditions that support their life processes. For example, the protection and improvement of Preble's meadow jumping mouse habitat (Objective 1.1) will benefit many other species that depend on riparian areas for survival, as well as wetlands and the tall upland shrubland community. Weed management strategies (Objective 1.5) will improve habitat conditions for numerous grassland-dependent species, including the short-horned lizard, various ground nesting birds and small mammals, and some rare plants such as the forktip three awn.

While it is not outlined specifically in the objectives, the Service will continue to informally monitor general wildlife populations and rare plant communities on the Refuge. In addition, the Service will work with CDOW, the Colorado Natural Heritage Program, area universities and other partners to ensure that general wildlife and rare plants that are not directly addressed in the objectives are protected and managed on the Refuge.

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Preble's meadow jumping mouse is a threatened species found on the Refuge.

Objective 1.1 - Preble's Habitat Management

Background

As the only known federally listed species that resides on the Refuge, it is the Service's responsibility to protect and conserve the threatened Preble's meadow jumping mouse and its habitat. The life history of this species has not been studied thoroughly. What has been gleaned from habitat studies is that the species is a habitat specialist relying on well-developed shrub- dominated riparian vegetation. Not only riparian areas are utilized; upland shrub and grasslands provide travel corridors, nest sites and forage. The replacement of native vegetation by noxious weeds and excessive grazing is shown to reduce the quality and quantity of suitable Preble's habitat (Compton and Hugie 1993).

Objective

Beginning in the first year and throughout the life of the CCP, protect Preble's habitat, maintaining and improving approximately 1,000 acres of Preble's habitat on the Refuge.

Rationale: The Service will place a priority on the protection and improvement of riparian, wetland and adjacent grassland habitat that have the potential to support Preble's. Preble's have evolved with grazing and browsing by ungulates, especially deer, and under normal circumstances should not be impacted by ungulate behavior. If, however, Refuge deer become overpopulated, over grazing/browsing within riparian areas has the potential to adversely affect Preble's habitat in isolated areas.

Strategies:

1.1.1 – Establish permanent transects in each stream drainage and survey these transects every 2 to 3 years

for the presence/absence and abundance of Preble's using live-traps in linear transects parallel to the stream, recording dominant vegetation type at trap locations (Kaiser-Hill 2001; Burnham et al. 1980). Establish exclosures to determine a baseline level of browsing and grazing.

1.1.2 – Allow natural revegetation of native species on lightly used roads in Preble's habitat including unimproved stream crossings.

1.1.3 – While the species is under the consideration of the ESA, consult with the Service's Ecological Services field office on actions potentially adversely affecting Preble's.

1.1.4 – Develop habitat-sensitive weed management strategies for use in Preble's habitat areas.

1.1.5 – Control noxious weeds in Preble's habitat to prevent an increase in weed distribution and density using IPM tools (biological, mechanical, chemical applications and limited prescribed fire).

1.1.6 – If necessary, protect Preble's habitat by using fencing and ungulate population control to exclude grazing/browsing animals if the quality of the habitat is threatened.

1.1.7 – Seek partnerships and funding for the performance of biannual surveys for the presence and distribution of Preble's in areas where existing and proposed Refuge recreational trails cross Preble's habitat using live-trapping in grid patterns that encompass the stream and uplands. Record level and type of recreation use in the Preble's survey areas.

1.1.8 – Manage for species recovery as indicated in the Service Recovery Plan (in draft 2003).

Objective 1.2 - Xeric Tallgrass Management

Background

Xeric tallgrass prairie is a rare vegetation community type that will be protected, maintained and restored in suitable locations. Tallgrass prairie evolved with the natural processes of fire and grazing, which are important in supporting and invigorating the prairie ecosystem. The disruption of these natural processes renders the prairie community prone to the establishment of noxious weeds that often out-compete native plants. Infested native plant communities are reduced in their capacity to support native wildlife populations. A variety of techniques are needed to restore healthy, balanced native communities. IPM involves using techniques that simulate natural processes and could include: prescribed fire; revegetation with native species; mechanical control methods such as mowing, root grubbing and hand pulling; chemical applications; grazing; and biological agents.

As IPM tools, prescribed fire and grazing are useful in helping to control weeds, reduce plant litter, recycle nutrients and improve the overall health and vigor of the native grasslands. Prescribed fire will be conducted considering state air quality regulations, ecological timing (to maximize benefits to desirable species and effectiveness in controlling weed species), weather conditions and operational logistics. Grazing for ecological restoration purposes will likely consist of managed cattle for short periods of time to simulate natural processes and invigorate native grasses (grazing for the specific purpose of weed control is typically conducted using goats). Monitoring of these treatments and their effectiveness will allow the Service to adapt and alter techniques to improve long-term effectiveness.

Objective

By year 15, manage the existing extent (about 1,500 acres) of the xeric tallgrass prairie across the Refuge to achieve an average relative cover of no less than 60 percent (± 4 percent) native grasses and 10 percent (± 5 percent) forbs, with no more than 10 percent of the average cover to be invasive non-native species. Maintain the total number of native species to be at least 80 percent of the about 285 plant species that have been identified in the tallgrass community prior to Refuge establishment.

Rationale: Management focus will be on maintaining and improving the 1,500 acres of xeric tallgrass across the site from the conditions that existed at the time of Refuge establishment. IPM techniques, as described in Objective 1.5 - Weed Management, will be used to maintain the native composition of species in the xeric tallgrass communities. While the number of plant species within the community fluctuates annually according to climactic conditions, a total of about 285 species are consistently found within this community. Not meeting the objective as stated above does not necessarily indicate the xeric tallgrass is critically imperiled but will warrant a more thorough investigation. Prescribed fire will be conducted Refuge-wide to stimulate native plant growth, reduce plant litter and help control weeds in the xeric tallgrass community.

Strategies:

1.2.1 – Within 2 years, produce a long-term vegetation management plan that identifies detailed strategies for weed management, restoration and xeric tallgrass prairie

species composition to be attained by the end of the CCP.

1.2.2 – Throughout the growing season, conduct informal monitoring of grasslands for noxious weeds.

1.2.3 – At a minimum, every 3 years survey selected vegetation point intercept transects to determine ground cover, vegetation density, species and species richness, document effectiveness of weed control, assess impacts of disturbance on plant communities, track ratio of warm season to cool season species and provide overall assessment of the status of the tallgrass community (Kaiser-Hill 1997; Owensby 1973).

1.2.4 – Use prescribed fire in conjunction with other restoration tools such as grazing, mowing, herbicides and biological controls to simulate natural processes that once existed at Rocky Flats.

1.2.5 – Participate in regional efforts to implement tallgrass prairie conservation measures.

1.2.6 – Suppress all wildfires.

1.2.7 – Use prescribed fire in areas identified in Figure 18. Prescribed fire may be used in grassland areas at a average frequency of 5 to 7 years (riparian areas 5 to 10 years). These can occur for two years in a row but not less frequently than once every 10 to 12 years. Burn areas will average about 200 to 500 acres per year of both xeric and mixed grasslands and portions of riparian communities across the site.

1.2.8 – Use grazing in areas identified in Figure 18. Grazing on a specific grassland area will be limited to short duration with high animal numbers (flash grazing for an average of 2 weeks) as identified in the Vegetation and Wildlife Management Plan. Temporary paddocks with electric fencing will be used to contain livestock in specific areas.

1.2.9 – Monitor ecological conditions before and after the application of any specific restoration tool.

1.2.10 – In accordance with Objective 3.2 - *Visitor Safety*, close the Refuge to all public use prior to and during the use of prescribed fire on the Refuge.

Objective 1.3 - Mixed Grassland Prairie Management

Background

Nearly one half of the Refuge is vegetated with shortgrass prairie communities, including mesic mixed grassland, xeric needle and thread grassland, short grassland, and reclaimed mixed grassland. While these communities are habitat for a variety of wildlife species on the Refuge, the Service has not outlined very many specific management strategies for the mixed grassland prairie at the Refuge. Instead, management strategies that are important to these prairie communities, including managing weeds, managing prairie dogs, restoring unused roads and sustaining habitat for introduced species, are covered under other wildlife and habitat management objectives. However, because many native wildlife species rely on diverse habitat components that are not present in agricultural fields, hay meadows, or a monoculture of plant species, the Service has outlined specific management strategies related to restoration of these areas. Maintenance and enhancement of these mixed grassland prairie communities is integral to other, more specific objectives.

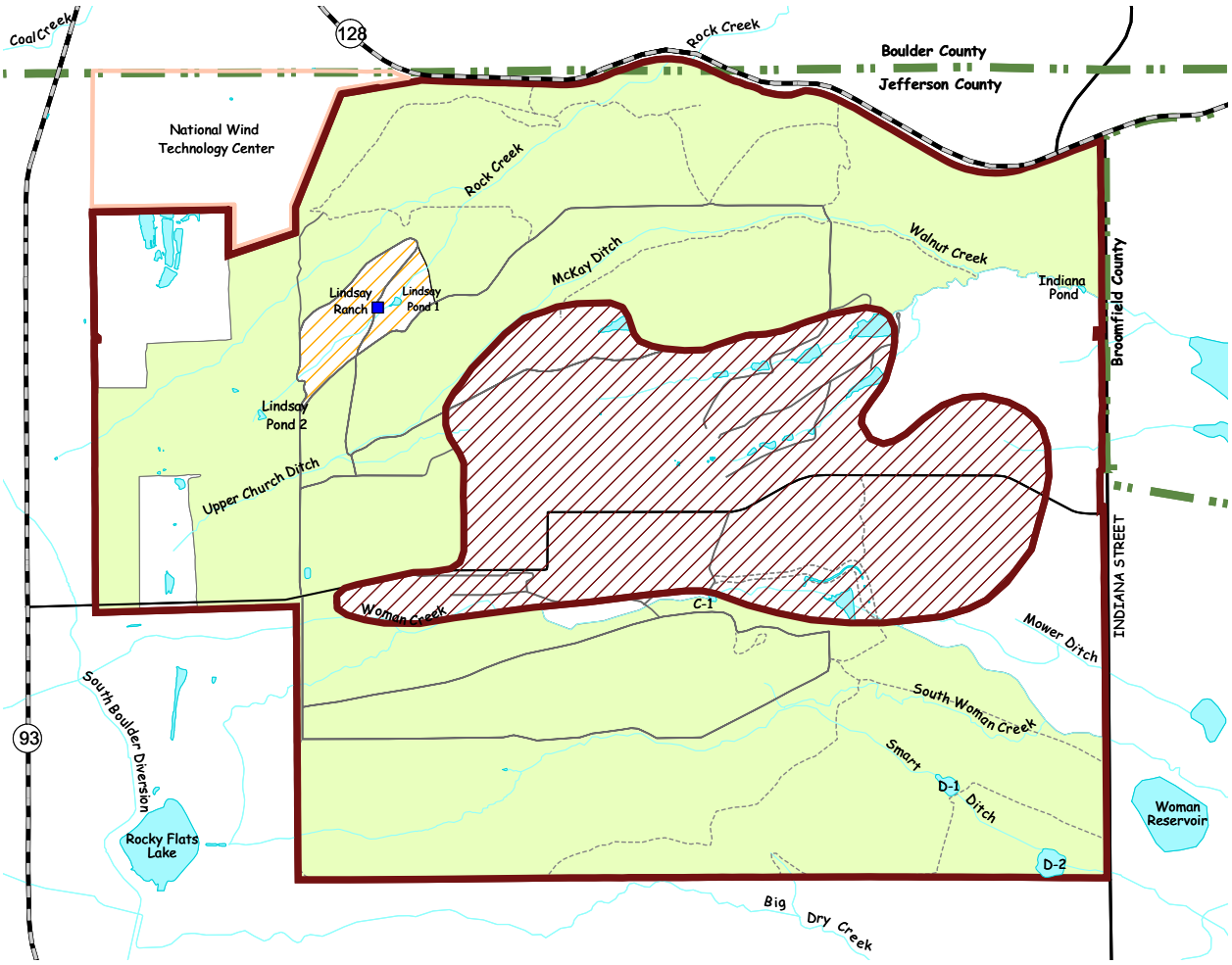
As outlined in Objective 1.5 - *Weed Management*, a variety of IPM tools, including managed grazing and prescribed fire, will be used to maintain the health and integrity of the mixed grassland prairie communities. Prescribed fire will be conducted considering state air quality regulations, ecological timing (to maximize benefits to desirable species and effectiveness in controlling weed species), weather conditions and operational logistics. Grazing for ecological restoration purposes will likely consist of managed cattle for short periods of time to simulate natural processes and invigorate native grasses (grazing for the specific purpose of weed control is typically conducted using goats). Monitoring of these treatments and their effectiveness allows for adaptation and alteration of techniques to improve long-term effectiveness.

Objective

Through the life of the CCP, maintain and improve the vigor and native species composition of short and mesic mixed grassland habitat according to the management objectives for weed management, prairie dog management, habitat restoration and species reintroduction. Additionally, restore 300 acres of non-native grassland in the southeast corner of the Refuge (hay meadow), as well as other reclaimed grassland areas, to a native mixed grassland community.

Rationale: The mixed grassland prairie communities at the Refuge provide habitat for a variety of wildlife species. The Service will restore non-native grassland areas, including the hay meadow, to improve the diversity of habitat for a variety of species. In addition, the mixed grassland prairie communities will be managed according to the specific purposes of other objectives. Prescribed fire will be conducted Refuge-wide to stimulate native plant growth, reduce plant litter and help control weeds in the mixed grassland prairie communities.

US Fish & Wildlife Service
Rocky Flats National Wildlife Refuge
Jefferson County, CO



Prescribed Fire and Grazing

- Areas Where Prescribed Fire and Grazing May Be Used
- Areas Where Grazing Only May Be Used
- DOE Retained Area (Subject to Change)

0 0.5 1 Mile

November 2004

N

Figure 18. Prescribed Fire and Grazing Areas

Strategies:
1.3.1 – Use IPM strategies to control or reduce noxious weed infestations and maintain or improve the vigor of native short and mesic grassland according to Objective - 1.5 *Weed Management* and Objective 1.4 - *Road Restoration and Revegetation*.

1.3.2 – Allow short and mesic grassland communities to support prairie dog expansion, according to Objective 1.7 - *Prairie Dog Management*.

1.3.3 – Maintain short and mesic grassland communities as needed to support the reintroduction of sharp-tailed grouse or other species, as directed under Objective 1.8 - *Species Reintroduction*.

1.3.4 – Suppress all wildfires.

1.3.5 – Use prescribed fire in conjunction with other restoration tools such as grazing, mowing, herbicides and biological controls to simulate natural processes that once existed at Rocky Flats.

1.3.6 – Restore non-native reclaimed grasslands in the hay meadow and other areas to a native mixed grassland community.

1.3.7 – Use prescribed fire in areas identified in Figure 18. Prescribed fire may be used in grassland areas at a average frequency of 5 to 7 years (riparian areas 5 to 10 years). These can occur for two years in a row but not less frequently than once every 10 to 12 years. Burn areas will average about 200 to 500 acres per year of both xeric and mixed grasslands and portions of riparian communities, across the site.

1.3.8 – Use grazing in areas identified in Figure 18. Grazing on a specific area will be limited to short duration with high animal numbers (flash grazing for an average of 2 weeks) as identified in the Vegetation Management Plan. Temporary paddocks with electric fencing will contain the livestock in specific areas.

1.3.9 – Monitor ecological conditions before and after the application of any specific restoration tool.

1.3.10 – In accordance with Objective 3.2 - *Visitor Safety*, close the Refuge to all public use prior to and during the use of prescribed fire on the Refuge.

Objective 1.4 - Road Restoration and Revegetation

Background
Currently about 70 miles of roads occur at the Refuge (of which about 20 miles will remain under DOE's jurisdiction). The removal and revegetation of extraneous roads will provide more wildlife habitat and reduce the effects of fragmentation. Fragmentation results from roads, trails and other disturbances interrupting continuous habitat with unsuitable and possibly hostile environments. Fragmentation can affect plants and animals, resulting in the isolation of populations or individuals, reduction of genetic diversity, reduction of carrying capacity and other effects. Roads provide corridors for predators and are prone to weed infestations. Abrupt vegetation changes at road edges alter light, temperature and wind exposure. Revegetation and the restoration of natural contours, either by natural succession or mechanical grading, will increase the quality and quantity of native wildlife and plant habitats.

The Service will retain about 25 miles of roads for maintenance, fire control, utility and ecological monitoring access. In some cases, the roads will also be used as trails. Unless designated otherwise, access roads will be closed to public use.

Objective
Beginning in the first year and completed within the life of the CCP, revegetate approximately 26 miles of unused roads with 13 stream crossings. This will include about 7 miles of xeric tallgrass habitat and about 11 miles of mixed grassland prairie.

Rationale: Roads across the Refuge that are not being used for public use, fire protection, or maintenance access, will be restored and revegetated, while others will be narrowed to the width of a trail.

Strategies:
1.4.1 – Allow natural revegetation of native species on lightly used roads and unimproved stream crossings, in areas not dominated by weeds.

1.4.2 – In select locations, prepare (including soil prep, culvert removal, fill, regrading to match original contours, herbicide application) and seed roadways and uplands with native species appropriate to soil type, slope and aspect.

1.4.3 – Where suitable, revegetate stream crossings with woody riparian species.

1.4.4 – Informally survey roadways for noxious weeds during the growing season and apply IPM techniques.

1.4.5 – Work with the Service's Ecological Services office and other agencies for ESA consultation and necessary permits in Preble's habitat and wetlands and adjacent buffer zones.

1.4.6 – Every 3 years survey restored habitat areas along selected vegetation point intercept transects to determine ground cover, vegetation density, species

and species richness; document effectiveness of weed control; assess impacts of disturbance on plant communities; and provide overall assessment of the vegetation community and restoration success (Kaiser-Hill 1997; Owensby 1973).

Objective 1.5: Weed Management

Background

Noxious weeds are nonnative plant species that invade an area that has been disturbed or where vegetation is stressed. Noxious weed infestations reduce the capacity of native plant communities to support wildlife populations and a diversity of organisms. Soil disturbances and cessation of the natural processes such as fire and grazing have resulted in a proliferation of noxious weed species at Rocky Flats.

IPM involves techniques that simulate the processes that contribute to the integrity of the ecosystems and can be applied when conditions are optimum for greatest effectiveness: prescribed fire; revegetation with native species; mechanical methods of mowing, root grubbing and hand collection; chemical applications; and biological agents. Depending on the location and treatment, controlled grazing by goats or cattle can be used as ecological restoration tools (as discussed in Objective 1.2 - *Xeric Tallgrass Management*) or for weed management purposes.

Monitoring the effectiveness of treatment allows adaptation and alterations of techniques to improve long-term effectiveness. Diffuse knapweed and Dalmatian toadflax are the principal threats to the grasslands, while Canada thistle threatens wetlands and riparian areas. Weed management efforts will seek to prevent the spread of existing infestations and the establishment of new ones.

In accordance with the Colorado Noxious Weed Act, the control of "list B" noxious weed species such as Diffuse knapweed, Dalmatian toadflax, and Canada thistle will be prioritized over the control of "list C" species such as field bindweed and jointed goatgrass. Biological controls will be planned to minimize potential impacts to native species.

Objective

Reduce the density of diffuse knapweed and Dalmatian toadflax populations by 15 percent within the first 5 years, 30 percent within 10 years and 60 percent within 15 years (as described in Kaiser-Hill 2002). Reduce the density and spread of other noxious weed species, especially Canada thistle by 50 percent within 15 years. Limit and control the establishment of weed species (Jefferson County, Boulder County and State of Colorado weed lists) not yet observed on the Refuge.

Rationale: The full range of IPM tools, including chemical, biological and mechanical control, prescribed

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Prescribed fire will occur in designated areas outside of DOE-retained lands.

fire and grazing, will be available to reduce noxious weed concentrations throughout the Refuge. Prescribed fire will be subject to an approved fire management plan and state air quality regulations. Grazing also will be subject to an approved plan. Burning along fence lines will reduce seed spread of noxious weeds, and the removal of plant litter will reduce the amount of herbicide that will be required to control weed infestations in that area.

Strategies:
1.5.1 – Employ an IPM approach to include the application of herbicides to perimeters of knapweed and toadflax patches to prevent their spread. Redistribute established biological control agents across the Rock Creek drainage and continue releases. Rake along fence lines and dispose of all tumbleweeds. Grub and handpull where needed.

1.5.2 – Annually identify and map weed patches using a Global Positioning System (GPS) to demarcate the areal extent and relative severity of infestations. Map treatment sites and monitor for efficacy in subsequent growing season.

1.5.3 - Correlate weed management with prairie dog management to minimize weed infestations in prairie dog expansion areas.

1.5.4 – Develop a comprehensive IPM plan.

1.5.5 – Conduct annual informal survey for new infestations during the growing season, focusing on roadways, trails, restoration areas and disturbed sites.

1.5.6 – If necessary, establish temporary interior fencing in areas where weeds are wind dispersed to collect weeds and limit dispersal. Burn along fence lines and dispose of all tumbleweeds.

1.5.7 – Use managed grazing of goats, or other livestock as appropriate for short periods to control weed infestations and simulate natural grassland processes.

Objective 1.6: Deer and Elk Management

Background
CDOW has primary responsibility for the management of deer and elk herds throughout the state and cooperated with the DOE for wildlife management at Rocky Flats before Refuge establishment. CDOW strives to set population levels at 80 percent carrying capacity, but the Service believes that setting a target population level for the Refuge will provide for better management of the ungulate population and will present fewer difficulties in determining what the carrying capacity should be. The resulting target population level may be lowered if degradation is occurring in Preble's habitat (riparian and upland shrubs). Continued cooperation with the CDOW will provide continuity in management, sharing of resources and provide larger habitat areas for deer and elk. Management of deer and elk populations is necessary to maintain the health of the herds and prevent the degradation of sensitive habitats such as riparian woodlands and shrublands.

Objective
Within 3 years, establish deer and elk population targets to be achieved by year five. Adverse effects to Preble's or other federally endangered or threatened species and their habitats may necessitate reduced population target levels.

Rationale: A public hunting program may be all that is necessary to control the herd size; however, additional culling by Refuge staff and CDOW, or keeping the herd away from sensitive habitat areas with exclosures or temporary fencing may be required. The Service will correlate the establishment of population targets with the public hunting program to maximize the utility of hunting as a management tool and to ensure that it does not adversely impact populations.

Strategies:
1.6.1 – Coordinate and assist CDOW to monitor and manage populations through a public hunting program, culling by Refuge or CDOW personnel, or temporary exclosures.

1.6.2 – Assist CDOW in establishing target populations for deer and elk on the Refuge.

1.6.3 – Every 2 years monitor for ungulate induced degradation using multiple methods for foliage density, foliage height diversity and plant species diversity (Anderson and Ohmart 1986) in the riparian woodlands, riparian and tall upland shrub communities in Preble's habitat.

1.6.4 – Perform annual deer and elk relative abundance or relative density study by direct count.

1.6.5 – Establish permanent vegetation photo points in riparian and upland shrubs and use them to monitor for excessive habitat degradation by ungulates every 2 years. Establish exclosure plots to determine the extent of browsing.

1.6.6 – Work with other agencies to protect movement corridors between the Refuge and nearby habitat areas.

Objective 1.7 - Prairie Dog Management

Background
Prairie dogs are important components in the short and mesic grasslands systems. They are commonly considered a "keystone" species because their activities (burrowing and intense grazing) provide food and shelter for many other grassland species. While black-tailed prairie dogs are no longer a candidate species for threatened status listing under the ESA (as of August 2004) the Service still has a strong interest in conserving the species and habitat where appropriate.

Rocky Flats contains about 2,460 acres of potential prairie dog habitat, based on an analysis of suitable soils, vegetation, and slope. While about 113 acres of prairie dog colonies have been identified in recent years, active prairie dog colonies at Rocky Flats currently comprise an area of about 10 acres. Thresholds for prairie dog expansion in the various alternatives are based on these existing conditions and the extent of potential habitat.

Objective
Allow prairie dog populations to expand up to 750 acres in areas of non-native grassland as well as short and mixed native grasslands outside of recognized Preble's habitat across the Refuge

Rationale: Restoration is a key component of the CCP. The Service will manage for a sustainable prairie dog population that contributes to the overall function and integrity of the grassland communities and does not degrade other sensitive resources (such as wetlands, shrublands and xeric tallgrass prairie). With limited staff resources, it could be difficult to limit prairie dog expansion if they populate large areas, so it is important that the Service maintain a manageable prairie dog population on the Refuge. If necessary, the Service will try to limit the expansion of prairie dogs into sensitive areas that do not provide primary habitat for prairie dogs. Because human recreation is a significant component of Alternative B, plague control methods may be needed in prairie dog management to protect prairie dog colonies as well as Refuge visitors.

Strategies:
1.7.1 – If necessary, trap and relocate within the Refuge, or use other methods to exclude prairie dogs from Preble's habitat and xeric tallgrass throughout the Refuge.

1.7.2 – Use intra-Refuge relocation as required.

1.7.3 – Do not accept prairie dogs from off-Refuge relocation projects.

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The Service will manage for a sustainable prairie dog population that contributes to the function and integrity of the grassland communities.

1.7.4 – Cooperate with DOE's stewardship designee to manage prairie dogs and exclude them from DOE retained lands with visual and vegetative barriers where necessary.

1.7.5 - Correlate prairie dog management with weed management efforts to minimize weed infestations in prairie dog expansion areas.

1.7.6 – Annually monitor and map the location, extent and distribution of prairie dog populations including densities and vegetation characteristics within prairie dog towns.

1.7.7 – Continuously monitor for plague and respond with flea control if appropriate.

Objective 1.8 - Species Reintroduction

Background
CDOW holds the primary responsibility for wildlife management in Colorado and cooperated with the DOE for wildlife management on Rocky Flats before Refuge establishment. CDOW, through a cooperative effort with City of Boulder, introduced a small number of plains sharp-tailed grouse just north of the Refuge on Boulder's

open space land during spring 2003 and is interested in expanding the introduction of the grouse onto the Refuge. The Service worked with CDOW to introduce northern redbelly dace and the common shiner in Rock Creek during summer 2003.

Objective
Within 3 years of Refuge establishment, evaluate the suitability for introducing/reintroducing plains sharp-tailed grouse and other native species, prioritize the species that could be introduced/reintroduced during the life of the CCP and implement population monitoring of reintroduced species at least annually until populations are established.

Rationale: A full evaluation of Refuge habitat suitability is needed before introductions/ reintroductions are planned. Service staff will play an active role in evaluating the suitability of reintroduction efforts and will partner with CDOW to manage implementation. Population monitoring by Service staff will be implemented as necessary.

Strategies:
1.8.1 – Coordinate with and assist CDOW in evaluating the suitability of the Refuge for plains sharp-tailed grouse and other native species.

1.8.2 – Oversee and assist CDOW with species release, monitoring and habitat maintenance on the Refuge.

1.8.3 – Annually monitor native fish (northern redbelly dace and common shiner) in Rock Creek. If needed, reintroduce them in the Walnut Creek drainage and Woman Creek (provided suitable habitat exists), until successful establishment.

1.8.4 – If found suitable for introduction, during the first 2 years of the CCP, complete a management plan for the plains sharp-tailed grouse.

Goal 2. Public Use, Education and Interpretation

Provide visitors and students high quality recreational, educational and interpretive opportunities and foster an understanding and appreciation of the Refuge's xeric tallgrass prairie, upland shrub and wetland habitats; native wildlife; the history of the site; and the NWRS.

Objective 2.1 - Visitor Experience

Within the first 5 years of the Refuge's establishment, the Service will initiate efforts to make Refuge visitors feel safe and will ensure that at least 75 percent of visitors will be informed about the cleanup effort undertaken prior to Refuge establishment.

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Wildlife observation and interpretation will help foster an understanding of wildlife and its habitat.

Rationale: Access to the Rocky Flats site has been highly restricted during both the nuclear production and the cleanup phases of the site's history. A substantial amount of public skepticism about the site's safety and a lack of familiarity with the site's resources are likely to hamper visitation. To ease public apprehension about the site, it will be crucial to ensure that visitors feel welcome, safe and comfortable. During focus groups about visitor use and outreach programs, specialists emphasized the importance of communicating with the public and explaining cleanup results and ongoing safety measures. One survey will be developed to measure all visitor experiences and will include questions related to use patterns, satisfaction and understanding of the resource (as referred to in objectives 2.1, 2.2, 2.3, 2.4 and 2.5).

Strategies:
2.1.1 – Provide a staff contact during peak seasons to welcome visitors and address safety concerns.

2.1.2 – Develop a survey designed to measure how safe visitors feel during their visit.

2.1.3 – Develop an outreach program that reaches beyond the site's boundaries and educates surrounding communities about the Refuge's safety and amenities.

2.1.4 – Use signage, staff contact, brochures, website and other means to convey safety information.

2.1.4 – Implement a volunteer program focused on helping the public and site visitors understand efforts that have been made to ensure the safety of site users.

2.1.6 – Keep surrounding communities including, but not limited to, Jefferson, Boulder and Broomfield counties, the cities of Westminster, Arvada, Boulder, Golden and Broomfield and nearby school districts informed about Refuge events and the progress of the CCP's implementation.

Objective 2.2—Public Access

By the end of 15 years, visitors will have opportunities to observe and photograph wildlife and to experience the Refuge's unique habitats, mountain and prairie views on foot, bike and horse. Satisfaction with their Refuge experience will be reported by 75 percent of visitors.

Rationale: One of the goals of the Refuge System is to foster an understanding of wildlife and its habitat by providing the public with safe, high quality, wildlife-dependent public uses. The Refuge provides opportunities for the public to experience the unique xeric tallgrass prairie, upland shrub, wetland habitats and learn about the site's history and the NWRS. Trails and overlooks will be designed to allow visitors to experience the diverse areas of the site and expansive views of the mountain backdrop and the Denver/Boulder metropolitan area.

Off trail use will be allowed on a seasonal basis for pedestrian access only in the southern portion of the Refuge during specific times of the year (October-April). Limiting off trail use to the late fall and winter will limit impacts to ground nesting birds and deer fawning in the uplands. Off trail use will provide opportunities for amateur naturalists, wildlife photographers and others to access their subjects.

To protect Preble's and other wildlife habitat, closures in the Rock Creek area and other drainages will be instituted on an as needed basis. Overlooks, however, will remain open and provide views into the riparian areas. Dogs will be prohibited on the Refuge because they are permitted on nearby open spaces and pose a threat to wildlife resources.

Strategies:
2.2.1 – Develop and implement a survey that measures visitor satisfaction and use patterns.

2.2.2 – Do not permit dogs on the Refuge.

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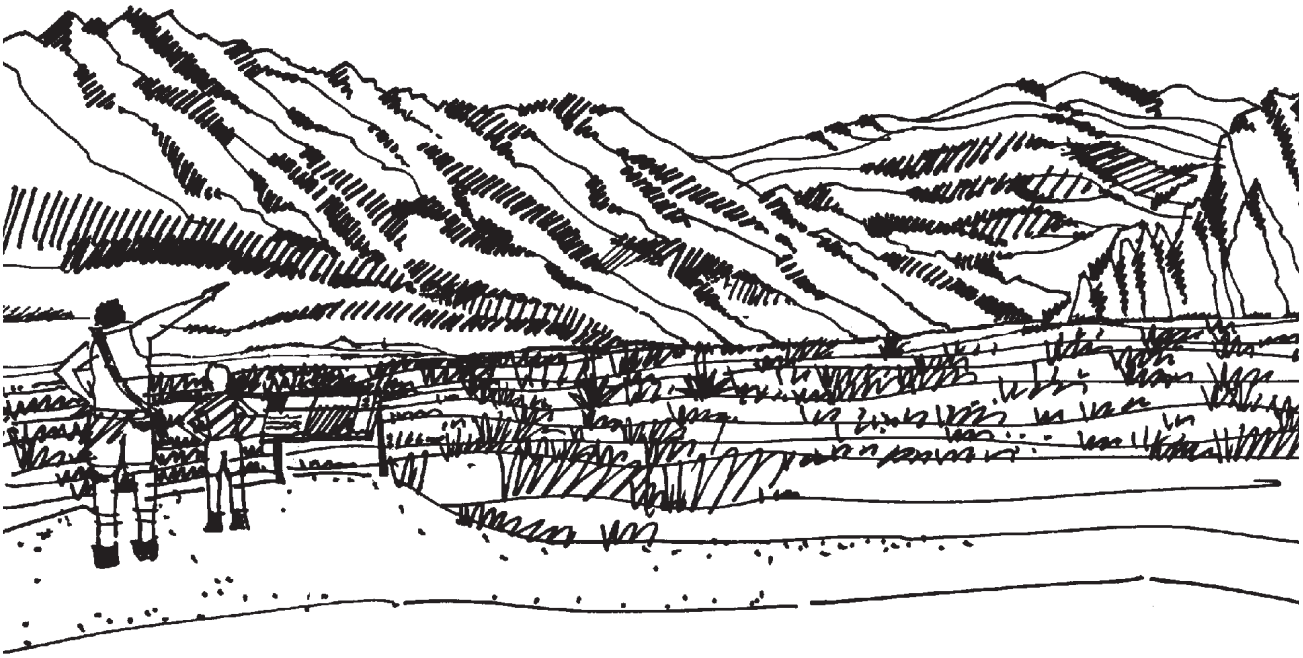

Interpretive signage will be used to foster an understanding and appreciation of the National Wildlife Refuge System.

2.2.3 – Develop trails to provide multiple opportunities for viewing and photographing wildlife.

2.2.4 – Allow off-trail use in the southern portion of the Refuge (south of Woman Creek) between October and April.

2.2.5 – Establish seasonal trail closures in Rock Creek and other drainages as necessary to minimize impacts to wildlife. Keep portions of the rim trails open for viewing the riparian areas.

2.2.6 – Provide a seasonally staffed visitor contact station to inform visitors about the Refuge's resources and how to best experience the Refuge during different seasons.

2.2.7 - Open the Refuge to the public from sunrise to sunset.

2.2.8 - Maintain public access on the main access road only. Close all other roads to public access.

2.2.9 - Do not permit motorized vehicles on the Refuge except in designated parking/access areas, refuge maintenance access and access to utility easements, ditches, and private mineral rights.

Objective 2.3—Appreciation of the National Wildlife Refuge System

By the end of the CCP, 65 percent of visitors will understand and appreciate the NWRS, the purpose of the Refuge and the natural and cultural resources of the Refuge.

Rationale: Given the drastic shift in the use of Rocky Flats from nuclear weapons production to a wildlife refuge, the public is unfamiliar with the site's new mission and its natural resources. As people begin to feel safe and comfortable with accessing the Refuge, the Service will strive to foster public awareness and appreciation of the Refuge System and the purpose of the Refuge. The Refuge's proximity to urban areas presents a good opportunity to educate a large number of people about the NWRS and its role in conservation across the country.

Strategies:
2.3.1 – Include questions in the visitor surveys and questionnaires (strategy 2.2.1) that measure visitors' understanding of the NWRS and the Refuge's resources.

2.3.2 – Create the interpretive media and programs identified in the environmental education component of the Visitor Services Plan, a step-down plan that will outline visitor services in more detail than the CCP.

2.3.3 – Work with outside partners to ensure visitors understand the Refuge's natural and cultural resources. Potential partners include the CDOW, surrounding city and county environmental education entities (government, non-profit and profit), Cold War Museum, Boulder and Jefferson County high schools and the State Historic Preservation Office.

2.3.4 – During peak seasons, provide adequate personnel to ensure that staff contact is available to visitors.

2.3.5 – Develop an interpretive signage system that educates visitors about the natural and cultural resources at the Refuge.

2.3.6 - Educate visitors about the National Wildlife Refuge System.

Objective 2.4—Public Use Tracking

Within the first year of the Refuge's establishment, open a pedestrian-only trail to Lindsay Ranch and monitor the number of visitors to the Refuge. During years 5 through 7, as more trails are opened, develop baseline data for numbers of visitors and their use patterns.

Rationale: The Refuge has not been open to the public; therefore, no visitor use data exists. Establishing quality baseline data is needed for future management decisions. A quantitative understanding of visitor activity (numbers of visitors, trail and use patterns) combined with an analysis of the quality of their experience will allow Service staff to enhance or limit visitor use opportunities.

Strategies:
2.4.1 – Develop a visitor use tracking system to measure the number of visitors. Use it in conjunction with a visitor experience survey to identify changes needed to improve the visitor's experience.

2.4.2 – Use trail or vehicle counters to record Refuge visitor numbers.

2.4.3 - Use the results of tracking to guide the design and planning of public use facilities and programs.

Objective 2.5—Public Use Assessments

By the end of the CCP, 25 percent of visitors will demonstrate an appreciation of the Service's stewardship mission and will have the desire to apply the conservation ethic to their own lives and share it with others.

Rationale: The goal of interpretation and environmental education is to foster an understanding and appreciation for natural processes that inspires people to behave in a more environmentally conscious manner. In addition to

providing on-site recreation and education opportunities, the public use program will strive to inspire citizens to become better land stewards in their own communities and stronger advocates for the Refuge system. This objective is in keeping with the goals of the System that promote establishment of a greater appreciation of fish, wildlife and plants and their conservation.

Strategies:
2.5.1 – Develop survey questions that gauge visitors understanding and appreciation of natural resources, stewardship and environmentally sensitive ethics.

2.5.2 – Distribute the survey, on and off-site, every 5 years (twice during the life of the CCP). Distribute the survey over the course of a year to ensure that feedback is collected during all four seasons.

2.5.3 – Design simple, low cost methods of gathering change of behavior data (e.g., web, volunteers, environmental education students).

2.5.4 - Use survey data to guide interpretive and educational program development as well as public outreach.

Objective 2.6—Interpretative Planning

Within 4 years of the Refuge's establishment, develop the interpretive component of a Visitor Services Plan outlining interpretive facilities and programs.

Rationale: An interpretive plan will be prepared as a component of an umbrella Visitor Services Plan. The interpretive plan will focus on creatively and accurately informing visitors and students about the new Refuge. The first step will be to communicate about the site's history and safe opportunities for access. During the early years of the Refuge's establishment, it also will be important to inform the public about the Refuge's wildlife, natural resources and scenic values and encourage people to visit the site. Gradually, the Service will need to develop and implement comprehensive interpretation programs that build an appreciation for the intricacies of the site's natural systems.

Strategies:
2.6.1 – Work with outside partners to develop the interpretive component of the Visitor Services Plan. Potential partners include CDOW, surrounding city and county environmental education entities (government, non-profit and private), Cold War Museum, Boulder and Jefferson county high schools and the State Historic Preservation Office.

Objective 2.7—Interpretative Programs

Within 15 years of the Refuge's establishment, implement the interpretive component of the Visitor Services Plan. Implementation will include the development of a wide range of interpretive programs and facilities.

Rationale: An interpretive plan will be prepared as a component of an umbrella Visitor Services Plan. The interpretive plan will be developed by Refuge staff and will describe interpretive as well as environmental education programs and related facilities. Initially, interpretation efforts will focus on providing information related to visitor comfort and safety. During later years of the CCP implementation, the focus will shift to the development of site-related interpretive programs and facilities. The range of programs and facilities will include guided tours about native flora and fauna, interpretive signage with both cultural and natural themes and overlook structures.

Strategies:
2.7.1 – Develop interpretive programs that explore the site's natural and cultural resources and are accessible to children and adults.

2.7.2 – Distribute interpretive media (newsletter, flyers, website) in accordance with outreach techniques outlined in the Visitor Services Plan.

2.7.3 - Develop interpretive facilities including interpretive signage and interpretive displays.

Objective 2.8—Environmental Education Planning

Within 5 years of the Refuge's establishment, develop a plan outlining on- and off-site environmental education programs for high school and college-level students as well as training for educators. Environmental education programs will meet state standards for learning, accommodate independent studies and tie to the mission of the NWRS and the site's natural resources and history.

Rationale: In the Denver Metropolitan area, natural resource study sites are needed to accommodate high school and college level research. This need was identified by educators and interpretive specialists at an environmental education focus group in the fall of 2002 and is based on the Refuge's proximity to the Colorado School of Mines and University of Colorado.

Specialists noted that there are several environmental programs for elementary and middle school children in communities surrounding the Refuge, but programs that provide opportunities for high school students to develop research skills through field study are limited. Since

high school and college students are more independent, the costs and staffing resources needed to develop these types of programs would be less than they would be for programs for younger students. Environmental education programs at the Refuge will be research oriented and will involve independent study and will therefore require only limited assistance and supervision from Refuge staff. The Service will, however, sponsor teacher workshops for local educators so they could effectively lead environmental education programs on the Refuge.

Given current public apprehension about the site's safety, an independent and off-site approach to environmental education is appropriate during the first 5 years of the Refuge's establishment. Although the educational program will focus on high school and college level students, limited on and off-site activities for visitors of all ages will also be included.

Strategies:
2.8.1 – Partner with area universities, high schools, the Cold War Museum and other educational institutions to develop the environmental education components of the Visitor Services Plan.

2.8.2 – Pursue environmental education grants in collaboration with area universities, high schools, the Cold War Museum and other educational institutions.

2.8.3 – Use website, email and other media to distribute information on refuge resources and data for student use.

Objective 2.9—Environmental Education Implementation

Within 8 years of the Refuge's establishment implement the environmental education components of the Visitor Services Plan and the program it outlines for high school and college level students.

Rationale: Once the Refuge becomes established and the public becomes more comfortable with site visitation through public education and outreach efforts, the Refuge staff will begin implementing the plan. Education programs will adopt the state's model content curriculum standards and focus on the Refuge's natural resources. Implementation of the program will include teacher workshops in which Service staff train local educators about the Refuge's resources. Educators will be required to attend a Service-sponsored workshop prior to leading environmental education programs on the Refuge.

Strategies:
2.9.1 – Work with area universities, high schools, the Cold War Museum and other educational institutions to implement environmental education programs.

2.9.2 – Collaborate with area universities, high schools, the Cold War Museum and other educational institutions and pursue grants to support environmental education programs.

2.9.3 – Use a variety of media to distribute a wide range of data that can be used by high school and college students.

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Two weekends a year, deer and/or elk hunts will be organized especially for youth and/or people with disabilities.

2.9.4 - Sponsor teacher workshops in order to inform educators about the Refuge's resources and facilitate teacher-led environmental education programs.

Objective 2.10 – Hunting Program

Within the first 2 years of the Refuge's establishment, institute a controlled youth and/or disabled person's deer and/or elk hunting program 2 weekends a year. After 2 years, annually modify the extent of the hunting program (number of permits and frequency) in order to ensure that target level ungulate populations are maintained. If appropriate for wildlife management, expand the hunting program to include able-bodied hunters.

Rationale: Hunting is consistent with the Refuge System's mission and is identified as a priority wildlife dependent use on refuges (outlined in the Improvement Act). Hunting allowed on the Refuge will be subject to state regulations and safety requirements. Hunting will be highly controlled in terms of number of users, user populations, time frame and allowable weapons. Hunting will be limited to short-range weapons such as archery and shotguns and only open during designated weekends to youth and disabled hunters. There are very few hunting opportunities for these special populations in the region and they will benefit from the tightly managed program at the Refuge.

There have been concerns expressed from the public about the consumption of deer at Rocky Flats if a public hunting program is implemented. Tissue samples, including meat tissues, of deer harvested at Rocky Flats in 2002 have been analyzed for contaminants. The results of the analysis indicate that there is no significant uptake of contaminants by deer or other wildlife species at Rocky Flats. Risk-based calculations based on these measurements indicate very low health risks (less than $1x10^{-6}$ increased cancer risk).

Hunting will also be an important management tool for maintaining target ungulate populations and optimal habitat conditions. If the Service, in consultation with CDOW, determines that a larger hunting program is needed to control ungulate populations, the program will be opened to the general public and not limited to youth and disabled hunters. A step-down hunting plan would be prepared as a component of an umbrella Visitor Services Plan.

Strategies:
2.10.1 – By year 1, develop a hunting plan with public involvement.

2.10.2 – Work with the CDOW and other interested entities to develop and implement the hunting plan.

2.10.3 – During the hunting weekends, close the Refuge to other public use.

2.10.4 – Allow hunters with proof of completion of a certified hunter safety course to hunt using archery and shotguns.

Objective 2.11—Hunting Program Assessment

Following each hunting season, assess the success of the hunting program and adjust hunting opportunities as appropriate.

Rationale: Refuge management will need to monitor and evaluate the newly instituted hunting program and adjust the program based on ungulate population sizes, safety, adjacent communities support and hunter satisfaction (one survey will be developed to address objectives 2.11 and 2.12).

Strategies:
2.11.1 – Develop a survey for hunters, adjacent landowners and surrounding communities to measure their interest and support for the hunting program.

2.11.2 – Monitor deer populations and habitat conditions to understand the effects of the hunting program on wildlife and Refuge resources.

Objective 2.12—Hunting Program Benchmarks

About 95 percent of hunters will report no conflicts with other users, a reasonable harvest opportunity and overall satisfaction with their Refuge experience.

Rationale: Due to the limited number of hunters and the healthy resident deer population at the Refuge, it is likely that youth and disabled individuals will be afforded a quality hunting experience.

Strategies:
2.12.1 – Develop a brief survey for hunters in order to evaluate their Refuge experience (combined with survey used to measure objective 2.11).

2.12.2 – Staff interaction on a one-on-one with hunters.

Objective 2.13—Recreation Facilities

Within 1 year of the Refuge's establishment, begin development of the hiking trail to the Lindsay Ranch and

build an un-staffed welcome kiosk and simple restroom facilities at the open access point. By year 5, additional trails will be open to public use. By year 7, 75 percent of all recreation facilities including trails, portable restrooms at trailheads, and interpretive signage at key locations will be established. Parking (4 parking areas ranging in size from 3 to 30 spaces with the largest parking area at the main entrance accommodating horse trailers) will also be developed during this period. By year 15, develop 100 percent of the trail system, including connections to adjacent areas for pedestrians, cyclists and equestrians.

Rationale: Recreational facilities will provide public access to the Refuge's many natural and cultural resources. During the early years of the CCP implementation, the Service will focus staffing and budgetary resources on habitat restoration including revegetating unnecessary roads, weed management, and restoring stream crossings. This focus will allow the Service to reduce the severity of noxious weed infestations and gain a foothold on road restoration before public trail use introduces new disturbances onto the landscape. The Service will also need to conduct baseline Preble's surveys before opening the site to public use. Therefore, with the exception of the immediate opening of the Lindsay Ranch hiking trail and welcome kiosk, development of the recreation facilities will need to be postponed until year 5. The un-staffed welcome kiosk positioned nearby the Lindsay Ranch trailhead will inform visitors about current access opportunities and future public use facility development.

If early restoration efforts are effective and budgetary and staffing resources are available, the Service may initiate construction of new trails and the conversion of selected roads to trails before year 5 and, if feasible, may open some trails or portions of trails ahead of schedule.

Bicycles and horses will be permitted on multiple use trails in order to facilitate regional trail linkages and to serve as a mode of transportation for wildlife viewing and accessing the Refuge from surrounding communities. Certain trails will be designated for pedestrian use only. Trails will be designed to provide connections, use existing road corridors and minimize impacts to sensitive wildlife resources.

The unstaffed welcome kiosk will serve as a central information dissemination point at the main entrance to the Refuge. The simple structure will include orientation and interpretive panels to explain Refuge resources and public use opportunities. Eventually, the structure will be augmented with a seasonally staffed visitor contact station that will include permanent displays, administrative offices, Refuge orientation information and educational materials.

Strategies:

2.13.1 – Construct an unstaffed welcome kiosk and portable restroom facilities within disturbed areas at the main parking lot and trailhead.

2.13.2 – Develop a universally accessible trail that links the main parking area to the Rock Creek overlook. Also provide an accessible mounting ramp for equestrian use.

2.13.3 – To provide a quality trail user experience, reduce reclaimed road widths to single lane, unpaved trails. However, maintain adequate width of trail corridors to allow them to also serve as access routes for maintenance or fire protection vehicles.

2.13.4 – Clearly mark all trails with signage indicating permitted uses.

2.13.5 - Prior to opening the Lindsay Ranch trail improve the trail corridor and conduct a Preble's survey.

2.13.6 – Where appropriate, use existing road corridors for trails to reduce negative impacts on site resources and site trails so they minimally impact habitat and provide a quality visitor experience.

2.13.7 – Realign road/trail corridors in specific areas with excessive slopes and/or sensitive wildlife habitat, or where wildlife viewing could be greatly enhanced.

2.13.8 – Designate some sections of the trail for pedestrian use only and create multi-use trails that permit bicycles and horses (equestrian use will be limited to the southern half of the Refuge).

2.13.9 – Implement seasonal trail closures as needed to protect wildlife and their habitats.

2.13.10 – Use existing roads to provide motorized access to parking and trailheads. Make all motorized access and parking areas unpaved.

2.13.11 – Work with adjacent landowners on issues related to trail linkages to trail systems north, south, east and west of the Refuge.

2.13.12 – Work with neighboring landowners, agencies and the Colorado Department of Transportation (CDOT) to develop safe pedestrian crossings at all trailheads.

2.13.13 – Work with others to develop an underpass under Indiana Street if it is deemed necessary for safe pedestrian connections to trails and open space east of the Refuge.

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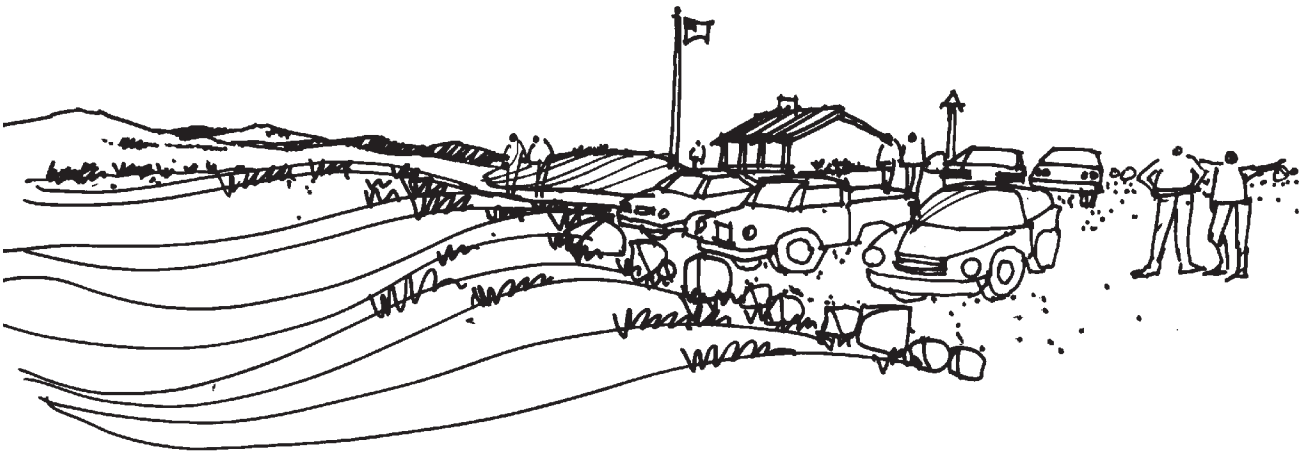

Within 10 years of the Refuge's establishment, a small, seasonally staffed contact station will be built.

2.13.14 - Post signage at all trailheads that clearly communicates access opportunities as well as information about the site's history, recent clean up efforts, and differences in management between the Refuge and neighboring open space properties.

2.13.15 - Educate equestrian users on the importance of using weed-free hay and removing manure from trails.

2.13.16 - Work with equestrian groups and ensure that they remove horse manure from trails on a volunteer basis.

Objective 2.14—Enhanced Recreation Facilities

Within 10 years of the Refuge's establishment, enhance trails, construct a seasonally staffed contact station with upgraded restrooms, develop maintenance facilities and create additional interpretive panels.

Rationale: To bolster the quality of the visitor experience, additional resources will be expended on visitor use facilities in the later years of the CCP. A seasonally staffed contact station will be located in an existing disturbed area where it will not fragment wildlife habitat. The facility will allow for more visitor contact and provide a central location for information dissemination and interpretation.

Trail-related improvements will include upgrading trail surfaces, overlooks and interpretive signage. These improvements will reduce maintenance costs, enhance the quality of the visitor experience and reduce resource damage. Viewing blinds could be constructed to enhance photographic and wildlife observation opportunities.

Strategies:
2.14.1 – Build additional interpretive signs.

2.14.2 – Improve trail alignments, surfaces and overlooks to minimize resource impacts and improve the visitor experience.

2.14.3 – Routinely evaluate trail and public facility impacts and establish measures to minimize impacts on wildlife from trails and other visitor facilities and uses.

2.14.4 – Build a viewing blind to enhance wildlife observation opportunities.

2.14.5 – Construct a small (approximately 750 to 1,000 square feet), seasonally staffed contact station.

2.14.6 - If trail conflicts arise, use signage and expanded trail corridors on sections of trail where site lines are limited to divide equestrians from other trail users.

2.14.7 - If funding is available, position benches at strategic locations along certain trails and construct a limited limited number of shade structures.

Objective 2.15— Cold War Museum

If the Cold War Museum secures a site adjacent to the Refuge and funds to develop a museum within the life of the plan, the Service will partner to co-locate interpretive and other public use facilities with the organization.

Rationale: The Refuge Act (P.L. 107-107,sec.3181) (Refuge Act - Appendix A) states that the Secretary may establish a Rocky Flats Museum to commemorate the contribution that Rocky Flats and its work force provided to winning the Cold War. The legislation states that the museum shall be located in the City of Arvada unless the Secretary determines otherwise. Therefore, there is a

possibility that the facility will be constructed on land adjacent to the Refuge should it become available and be deemed appropriate.

Partnering with the Cold War Museum on the development of a museum presents an excellent opportunity for the Service to reduce the footprint of public use facilities on the Refuge. The shared facility will house the simple interpretive displays and staff office space originally intended for the contact station. The Cold War Museum would also be staffed seasonally by Refuge staff and serve as a meeting area for guided tours and other Refuge programs. Additionally, the Cold War Museum facility would present increased opportunities to interpret the the history of the site as ranchland and a nuclear weapons production facility.

Strategies:
2.15.1 - Continue working with the Cold War Museum to explore potential museum sites adjacent to the Refuge.

Goal 3. Safety

Conduct operations and manage public access in accordance with the final Rocky Flats' cleanup decision documents to ensure the safety of the Refuge visitors, staff and neighbors.

Objective 3.1—Staff Safety

Throughout the life of the CCP, all Service staff working at the Refuge will participate in a Refuge orientation and training that will introduce them to the site itself, the institutional controls, CERCLA remedy requirements, safety procedures (both workers and public) and physical hazards. The orientation and training will be required prior to beginning an assignment.

Rationale: Rocky Flats National Wildlife Refuge is a CERCLA site that has undergone cleanup. Specific areas will remain under primary jurisdiction of the DOE and may remain off limits to the public. It will be important that Refuge staff receive specific training regarding the site background, remediation actions, CERCLA remedy requirements and institutional controls. This training will help ensure the safety of employees and visitors. Knowledgeable employees will be instrumental in ensuring that visitors are kept informed and feel safe during their visit to the Refuge.

Strategies:
3.1.1 - Develop an orientation training program that clearly addresses key Refuge safety issues.

3.1.2 - Provide first aid training to key staff who may be required to assist the public and staff on site should an accident occur.

3.1.3 - Develop a record keeping system to document worker training.

3.1.4 - As appropriate, develop site-specific appendixes to the Refuge Complex Safety Plan.

3.1.5 - Develop a health and safety plan, within a year of plan approval, to cover all Refuge operations.

3.1.6 - Implement a goal of zero incident performance.

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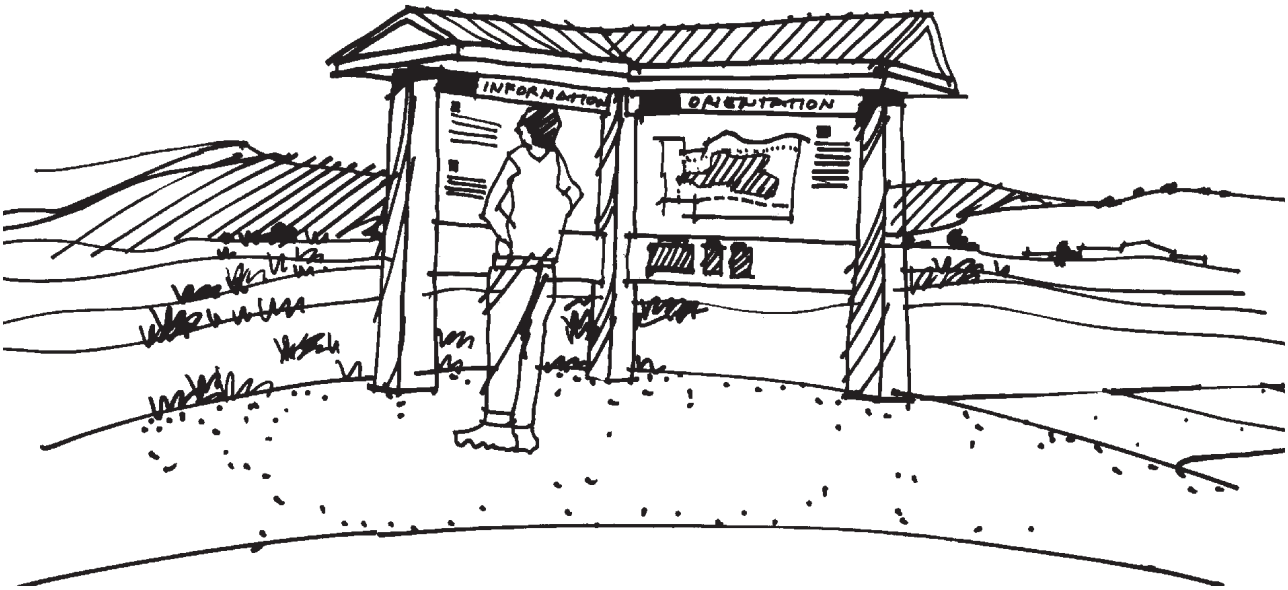

Maps and interpretive signs will inform visitors about the site's history, cleanup, and access restrictions.

Objective 3.2—Visitor Safety

Within 5 years of Refuge establishment 75 percent of visitors will be aware that the Refuge is safe and open for public access before they arrive. Upon arrival, these visitors will be informed of public use opportunities and restrictions.

Rationale: Both the EPA and the CDPHE have concurred that the Refuge will be safe for public access (Appendix D). However, given the Rocky Flats site's nuclear weapons production history, it will be important for the Service to clearly inform the public that it is safe to visit the Refuge and that the site offers opportunities to experience unique grassland habitat and many wildlife dependent recreation programs and facilities. In addition to promoting opportunities for accessing the Refuge, the Service will communicate to visitors about the site's history and areas on-site where public access is prohibited. Areas retained by DOE will most likely be closed to public access and access to sensitive habitats will be restricted at times. Similarly, the dilapidated structures within the Lindsay Ranch complex may be fenced off if they pose a safety hazard.

Outreach materials, signage and staff will educate the public about the steps to becoming a refuge, access restrictions and opportunities. DOE will post signage and construct fencing or another means of boundary demarcation to clearly identify all restricted areas that are subject to institutional controls. The Service will continue to work with DOE to ensure that the boundary is clearly visible to the public.

Strategies:
3.2.1 – Ensure that every guided program addresses the site's history.

3.2.2 – Include safety-related questions in the visitor survey. Surveys will be used to determine the safety knowledge of the visitors and understand how to adjust the safety awareness program based on this information.

3.2.3 – Provide maps and interpretive signs at all trailheads that inform visitors about the site's history, clean up, and access restrictions.

3.2.4 – Help potential users understand the site's restrictions and public use opportunities through a diversity of media including TV and radio programs, brochures, personal talks, website, public service announcements, news releases and articles. Also work with local school systems to educate teachers and students about the Refuge's recreational and educational potential.

3.2.5 – Provide Refuge access information to regional map and tour book publishers.

3.2.6 – Develop surveys that are implemented at Refuge access points to determine the safety knowledge of the visitors and understand how to adjust the awareness program based on this information. Data collection will be consolidated into one public use survey encompassing survey needs identified in other goals.

3.2.7 – Maintain a law enforcement presence on-site and ensure that Refuge employees are well informed and can educate visitors on Refuge safety restrictions and allowable uses.

3.2.8 – Document violations and measure the success of the program by the reduction in violations.

3.2.9 – Close the Refuge to public use prior to and during the use of prescribed fire on the Refuge.

3.2.10 - Work with DOE to clearly demarcate the DOE retained land boundary with a barbed-wire agricultural fence, permanent obelisks, signage or other appropriate means.

3.2.11 - Address the site's history in guided programs.

Goal 4. Effective and Open Communication

Conduct communication outreach efforts to raise public awareness about the Refuge programs, management decisions and the mission of the U.S Fish & Wildlife Service and the National Wildlife Refuge System among visitors, students and nearby residents.

Objective 4.1—Outreach

Within 5 years of the Refuge's establishment, develop and implement four outreach methods to inform the public about environmental stewardship, safety issues, CCP implementation and educate them on the missions of the Service and NWRS. Once established in year 1, outreach efforts will be ongoing throughout the life of the CCP.

Rationale: Historically, Rocky Flats has been a controversial site with substantial public interest and concern. The Service will respond to inquiries and educate the public about the site's transformation from a nuclear weapons production facility to a National Wildlife Refuge. Additionally, the Service will work with stakeholders, interst groups and the general public to inform them about the site's resources and the visitor

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The Service will continue to partner with CDOW.

programs and facilities. In order to achieve the Refuge's purposes, vision and goals, the Service will need to maintain open and regular communication with the public.

Strategies:
4.1.1 – At a minimum conduct outreach opportunities in Broomfield, Boulder, Arvada and Westminster and recruit participation from the local municipal governments, business communities, civic and educational organizations, conservation groups, recreational users and other interested stakeholders.

4.1.2 – Establish a monitoring system to measure the diversity of groups in attendance at outreach events.

4.1.3 – Use a variety of outreach communication methods such as a newsletter, website, news releases, local newspaper column and TV and radio programs.

4.1.4 – Encourage Refuge staff to attend selected government and organization meetings and participate with DOE in communicating with the public about long-term stewardship programs.

Goal 5. Working With Others

Foster beneficial partnerships with individuals, government agencies and non-governmental organizations and others that promote resource conservation, compatible wildlife-related research, public use, site history and infrastructure.

Objective 5.1—Emergency

Within 1 year of the Refuge's establishment, emergency response agreements will be in place with all adjacent fire districts for mutual aid in responding to fire and other emergencies. Additional emergency response and fire protection agreements will be developed with state and local law enforcement agencies as needed.

Rationale: The Refuge is small and in close proximity to a number of communities. Given the Refuge's location and the other on-site safety issues, rapid suppression of fire or response to other emergencies will be essential.

Strategies:

5.1.1 – Meet annually, or as often as needed, with partnering agencies including DOE, to coordinate fire and emergency response plans.

5.1.2 – Coordinate all prescribed fires with all nearby fire districts and other cooperating agencies.

Objective 5.2—Conservation

Throughout the life of the CCP, Refuge staff will meet annually (at a minimum) with local governments and other adjacent landowners, to coordinate habitat management and resource conservation strategies.

Rationale: The Service will encourage a regional management approach for the conservation and restoration of natural resources, which will require collaboration with surrounding landowners. Many natural resource management issues such as invasive weed control, wildlife corridors, recovery of declining species and impacts to resources caused by visitors will need to be coordinated across boundaries.

Strategies:
5.2.1 – Work closely with surrounding open space and natural resource entities such as Jefferson County, City of Boulder, Boulder County, City and County of Broomfield, City of Westminster, Town of Superior, City of Arvada and CDOW to develop resource management approaches for issues that cross Refuge boundaries.

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Volunteers will help with some restoration projects.

5.2.2 – Use volunteers to help with conservation and restoration activities.

5.2.3 – Work with adjacent landowners to maintain corridors for ungulate populations and other wildlife that migrate seasonally to and from the Refuge.

Objective 5.3—Research

Within the first 5 years of the Refuge's establishment, develop a list of research needs to be addressed by Refuge staff and external researchers and establish a system to evaluate and approve proposals for compatible scientific research that focuses on the Refuge's habitat, wildlife and public use.

Rationale: Because the Refuge will be a newly established refuge with limited resources, it will be important for Service staff to collaborate with outside researchers. Research partnerships would allow the Service to expand its baseline data and study management techniques more efficiently. Research that has direct implications for Refuge management, such as information gathering and analysis focused on wildlife, habitat and public use would be instrumental in shaping the management direction of the Refuge and similar prairie landscapes throughout the life of the CCP and into the future.

Strategies
5.3.1 – Establish criteria to evaluate research proposals that will ensure research is compatible with the Refuge mission, purpose and goals.

5.3.2 – Emphasize and support research focusing on studies that directly affect Refuge management.

Objective 5.4—Volunteer

Within 3 years of the Refuge's establishment, create a volunteer program and support the establishment of a Friends group for the Rocky Flats National Wildlife Refuge.

Rationale: Volunteers are essential for the growth and success of many refuges within the NWRS. Volunteers can assist with both resource conservation activities and visitor use programs. Support of a Friends groups would play an important role in leveraging local private resources and public support for Refuge programs.

Strategies
5.4.1 – Recruit volunteers from equestrian and bicycle groups and others to help maintain trails.

5.4.2 – Develop and implement a volunteer program that defines volunteer opportunities for participation in wildlife habitat and public use programs.

5.4.3 – Work with interested individuals to establish and maintain a nonprofit corporation who's objective is to positively support the Refuge.

Goal 6. Refuge Operations

Based on available funds, provide facilities and staff to fulfill the Refuge vision and purpose.

Objective 6.1—Staffing

Within 2 years of the Refuge's establishment, obtain base funding for three employees (3.0 FTE) for the Refuge and within 5 years, add one employee (1.0 FTE). Also assign collateral duties for Rocky Mountain Arsenal NWR staff. Fire management funding will be used for an additional two full-time (2.0 FTE) and two seasonal (1.0 FTE) employees.

Rationale: Due to the site's urban context, high public interest and extensive restoration requirements, on-site staffing and facilities will be necessary from the onset of the CCP's implementation. Staffing needs will be based on the current and projected NWRS's budgetary environment and the objectives of the CCP. Three full-time employees (3.0 FTE) will be required within 2 years of Refuge establishment to begin instituting habitat and restoration management practices. An increase in public use after year 5 will require one additional employee (1.0 FTE).

Due to the use of prescribed fire and the high probability and frequency of wildfires in the grasslands of the Refuge, fire personnel are included in the staffing. Refuge fire staff (3.0 FTE) will be responsible for suppressing wildfires, developing prescribed burn plans, overseeing prescribed fires and developing and maintaining mutual aid agreements. Because the Refuge will be managed as part of a complex, in conjunction with Two Ponds NWR and the RMA, some staffing resources will be shared between the three refuges. Collateral duties for Two Ponds and RMA staff at the Refuge will ensure that the new Refuge benefits from the experience and expertise of trained staff.

Strategies:
6.1.1 – Follow Service protocols for budget development and hiring of staff.

Objective 6.2—Operations and Management Facilities

Within 5 years of the Refuge's establishment, develop 50 percent of administrative and visitor use facilities for on-

site presence and connectivity with regional trail systems. Within 5 years of the Refuge's establishment, develop 50 percent of O&M facilities needed to support public use and conservation objectives. By year 10, complete all O&M facilities.

Rationale: During the early years of CCP implementation, management resources will be focused on public outreach and education beyond the site boundaries, developing partnerships and securing funding. Habitat conservation and restoration will be the primary management priority. Construction of the trail system, signage and orientation and interpretation facilities will follow the development of restoration measures.

During the first 5 years of the Refuge's establishment, the Service staff will rely on O&M facilities at RMA. Due to public outreach events and word of mouth, visitor numbers are likely to substantially increase once the Refuge is fully open to the general public in the fifth year of the Refuge's establishment. Therefore, it will be important to establish on site staffing and complete visitor facilities by year 10. Once visitor use facilities are established, on-site maintenance facilities will be constructed and interpretive signage and trails will be upgraded. Throughout the life of the CCP, RMA O&M facilities and staff will supplement Refuge operations. The Service will not use the land at Rocky Flats for residential or "bunkhouse" facilities during the life of the CCP.

Strategies:
6.2.1 – Prepare and submit projects for the Refuge Operations Needs System and Maintenance Management System database.

6.2.2 – Prepare a fire cache and install necessary water storage systems (e.g., tanks).

6.2.3 – Coordinate equipment use with RMA staff.

6.2.4 – Install boundary and trailhead signs along the Refuge boundary in order to identify access points and ownership.

6.2.5 – Renovate existing, on-site vehicle search buildings to create a small office space and to use for storage and other refuge operations.

6.2.6 – Provide administrative offices for Refuge employees within the contact station.

6.2.7 – Pursue partnerships and funding sources including but not limited to challenge cost share projects, Federal Highway Administration, CDOT and other transportation entities, Great Outdoors Colorado, CDOW, Mile High Youth Corps, Colorado Historical Society and Volunteers for Outdoor Colorado.

6.2.8 – Where possible, screen maintenance facilities from visitor use areas.

6.2.9 – Construct a small (1,750 to 2,250 square feet) maintenance/storage facility.

6.2.10 - Install a cistern or other storage system to provide water to the visitor contact station, offices, and maintenance facilities.

6.2.11 - Co-locate O&M facilities with public use facilities and construct facilities in areas that are already disturbed or degraded and will not impact important wildlife habitat.

Objective 6.3—Fencing

Upon the Refuge's establishment and throughout the life of the CCP, maintain the existing barbed-wire stock fence. The fence will line the entire perimeter and will be suitable for excluding neighboring livestock from trespassing on the Refuge.

Rationale: State law requires that a stock fence enclose the Refuge to prevent livestock trespassing. Visitor safety and wildlife habitat goals will be accomplished through signage, staff contact with visitors and internal fencing of off-limits areas. The Service will also work closely with DOE to ensure that the DOE retained land boundary is clearly demarcated.

Strategies:
6.3.1 – Attach boundary signage to the perimeter fence and any fencing delineating the DOE retained area.

6.3.2 - Advise DOE on the use of signage and fencing to demarcate the boundary of lands subject to institutional controls.

Objective 6.4—Cultural Resources - Lindsay Barn

By year five, develop a step-down plan for the preservation of all cultural resources on the Refuge. By the end of the CCP, interpret the Lindsay Ranch barn.

Rationale: Although the Lindsay Ranch structures are not eligible for listing in the National Register of Historic Places, they are valued by the public and present an opportunity to interpret the early ranching era at the Refuge. The Lindsay Ranch structures including a barn and house are not structurally sound and are in varying states of decay. In order to preserve the scenic value of the cultural resource, the Service and DOE initiated a project to stabilize the barn in 2003. Since the ranch

house is not structurally sound and presents a safety concern, the Service chose to concentrate its stabilization efforts on the barn. The house will be fenced off or taken down to minimize safety hazards. Should partners raise sufficient funds to stabilize and interpret the ranch house, the Service will be amenable to working with them to complete such a project. Over time, additional cultural resources may be uncovered on the Refuge. The Service will maintain a record of identified cultural resources. Where appropriate, the Service will provide interpretive signage to help visitors better understand the history of the Lindsay Ranch.

Strategies:
6.4.1 – Pursue partnerships to help fund the ongoing stabilization of the Lindsay Ranch barn.

6.4.2 – Maintain an inventory of all cultural resources found on site.

6.4.3 – Following all prescribed fires, survey burned areas for archaeological or cultural resources or artifacts.

6.4.4 – Work with interested parties and organizations to interpret the Lindsay Ranch and the story of homesteading on the Refuge.

6.4.5 – Use trail signage to identify the historic stage-coach stop and apple orchard in the Woman Creek drainage.

Objective 6.5—Cultural Resources - Site History

Within 5 years of the Refuge's establishment, develop a cooperative partnership with interested stakeholders, including the Cold War Museum, to interpret the history of the Refuge.

Rationale: The history of the Refuge represents diverse periods of time and topics ranging from Native American history to the settlement of the western frontier and nuclear weapons production during the Cold War. The history and cultural resources of the Refuge are of interest to many groups and individuals. Interested stakeholders, including the Cold War Museum, will be key partners in interpreting the site's history and cultural resources and securing funding for interpretation and stabilization efforts.

Strategies:
6.5.1 – Work with a variety of interested entities to manage and interpret the history of the site as it evolved through time. Interpretation programs will illuminate the historical evolution of the site including Native Americans, early settlement, ranching and Cold War histories.

6.5.2 – Work with appropriate state and federal agencies to manage the site's cultural resources appropriately.

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The Service will provide interpretive signage to help visitors better understand the history of the Lindsay Ranch.

Table 8. Summary of Objectives and Strategies

	Summary of CCP Objectives and Strategies
WILDLIFE and HABITAT MANAGEMENT	
Preble's Habitat Management	*Objective:* • Protect, maintain, and improve Preble's habitat throughout the Refuge. *Strategies:* • Survey Preble's locations and habitat every 2-3 years. • If necessary, exclude grazing/browsing animals to protect habitat. • Seek funding/partnerships to monitor impacts of recreation on Preble's.
Xeric Tallgrass Management	*Objective:* • Maintain xeric tallgrass habitat across the Refuge with a native species composition of 80%. *Strategies:* • Within 2 years, develop vegetation management plan. • Monitor every 2-3 years to determine species composition, document effectiveness of weed control applications and assess impacts of disturbance on plant communities across Refuge. • Use prescribed fire, grazing, mowing and other tools to stimulate the growth of native plants. • Suppress all natural wildfires. • Participate in regional xeric tallgrass prairie conservation efforts.
Mixed Grassland Prairie Management	*Objective:* • Maintain and improve the vigor and native species composition of short and mesic mixed grassland habitat. • Restore hay meadow and other areas to a native mixed grassland community. *Strategies:* • Allow short and mesic prairie to support sustainable prairie dog expansion. • Maintain short and mesic prairie to support the reintroduction of sharp-tailed grouse or other species. • Use prescribed fire, grazing, mowing and other tools to stimulate the growth of native plants. • Suppress all natural wildfires. • Restore hay meadow and other areas to native mixed grassland.

Summary of CCP Objectives and Strategies

WILDLIFE and HABITAT MANAGEMENT *(continued)*	
Road Restoration and Revegetation	*Objective:* • Revegetate 27.8 miles of unused roads and 13 stream crossings across the Refuge (to be completed by the end of the plan). *Strategies:* • Allow natural revegetation of lightly used roads and stream crossings. • In some locations, regrade and seed roads. • Survey for noxious weeds and apply IMP techniques to control noxious weeds in seeded road corridors. • Every 3 years survey to determine ground cover, vegetation density, species composition, and effectiveness of weed control and impact of disturbances.
Weed Management	*Objective:* • Across the Refuge, - Reduce the density of diffuse knapweed and Dalmation toadflax populations to 15%, 30%, and 60% for 5, 10 and 15 years respectively. - Reduce the density and halt the spread of other noxious weed species, especially Canada thistle, by 50% within15 years. • Prevent the establishment of species on County and State weed lists not yet observed on the Refuge. • Limit and control the spread and density of existing weed infestation. *Strategies:* • Employ an integrated pest management (IPM) approach to include prescribed fire, managed grazing, herbicides, biological controls, grubbing/hand-pulling, collecting tumbleweeds. • Annually map perimeters of weed infestations and treatment sites. • Develop comprehensive integrated pest management plan. • Informally survey for new infestations along roadways, trail, restoration areas and disturbed sites. • Establish interior fencing to collect wind dispersed weeds; burn along fence lines to dispose of collected weeds.

Summary of CCP Objectives and Strategies

WILDLIFE and HABITAT MANAGEMENT *(continued)*	
Deer and Elk Management	*Objective:* • Within 3 years, establish deer and elk population targets to be achieved by year 5. *Strategies:* • Use public hunting, culling, temporary exclosures, or hazing to manage populations. • Cooperate with CDOW in monitoring and controlling populations. • Monitor every 2 years to evaluate ungulate impacts on riparian and upland shrub communities in Preble's habitat. • Conduct annual abundance and density counts. • Use photo monitoring to document any habitat degradation. • Work with others to protect movement corridors.
Prairie Dog Management	*Objective:* • Limit prairie dog populations to 750 acres outside of recognized Preble's habitat and xeric tallgrass habitat throughout the Refuge. *Strategies:* • Annually monitor distribution of prairie dog populations. • Trap and relocate, or use other methods, to exclude prairie dogs from sensitive habitat areas. • Do not accept prairie dogs from off-site locations. • Monitor for plague.
Species Reintroduction	*Objective:* • Facilitate reintroduction of native extirpated species by or in coordination with CDOW. • Within 3 years, evaluate suitability for additional reintroduction of native extirpated species such as sharp-tailed grouse in coordination with CDOW. • Monitor redbelly dace and common shiner populations (introduced 2003) until successfully established. • Prioritize species to be reintroduced. *Strategies:* • Oversee and assist CDOW on species release, monitoring, and habitat maintenance. • If suitable, complete management plan for sharp-tailed grouse within first 2 years. • Annually monitor native fish in Rock Creek and introduce to other drainages.

Summary of CCP Objectives and Strategies	
PUBLIC USE, EDUCATION and INTERPRETATION	
Public Access	*Objectives:* • Within 5 years, 75% of visitors will feel safe. • By plan's end, visitors experience the Refuge on foot, bike and horse. • In year 1, open a trail to Lindsay Ranch. By years 5-7 open more trails and create baseline visitor data. • By plan's end, 25% of visitors appreciate Refuge stewardship and desire to adopt conservation ethics. *Strategies:* • Allow self-guided public access to trails and facilities. • Develop an outreach program. • Develop surveys to measure visitor experience. • Provide a seasonally staffed visitor contact station, overlooks, trails, and other facilities. Site trails (pedestrian only and multi-use trails for equestrian and bike use) to provide opportunities for wildlife observation. Allow limited off-trail use. Seasonally close some trails to minimize wildlife impacts. • Use signage, staff contact, brochures, website and other means to inform visitors about the steps to becoming a refuge and access opportunities and restrictions. • Implement volunteer programs. • Keep surrounding communities informed about Refuge events and plan implementation. • Develop an interpretive signage system and interpretive programs.
Interpretation	*Objectives:* • Within 4 years, develop a plan outlining interpretive facilities/programs. • Within 15 years, implement the interpretive component of the Visitor Services Plan. *Strategies:* • Work with partners to develop the interpretive component of the Visitor Services Plan. • Develop programs that explore the site's resources. • Distribute a variety of interpretive media.

Summary of CCP Objectives and Strategies	
PUBLIC USE, EDUCATION and INTERPRETATION ***(continued)***	
Environmental Education	*Objectives:* • Within 5 years, develop an education plan for high school and college students. • Within 8 years, implement the education component of the Visitor Services Plan. *Strategies:* • Partner with educational institutions and the Cold War Museum. • Use electronic and other media to distribute data.
Hunting	*Objectives:* • Within 2 years, institute a controlled youth and/or disabled person's deer and/or elk hunting program. Following year 3, consider expanding the hunting program to the general public. • Following each hunting season, assess the hunting program and adjust as appropriate. • 95% percent of hunters will report no conflicts with other users, and be satisfied with their experience. *Strategies:* • Work with the Colorado Division of Wildlife and other entities to develop a hunting component of the Visitor Services Plan and to monitor deer populations and habitat condition. • Close the refuge to others during hunting weekends and encourage staff to interact one-on-one with the hunters. • Develop a survey for hunters, adjacent landowners and surrounding communities.
Recreation Facilities	*Objectives:* • Within 1 year, develop Lindsay Ranch trail. By years 5-7 build 75% of trails. By year 15, build all facilities including about 4 miles of hiking trails and about 13 miles of multi-use trails. • Within 10 years, construct a seasonally staffed contact station/restrooms and maintenance facilities. *Strategies:* • Develop a universal access trail to the Lindsay Ranch overlook and pedestrian only trails in the Rock Creek drainage. • Mark trails with way finding and interpretive signs and seasonally close trails to protect wildlife habitats. • Construct seasonally staffed contact station, un-staffed welcome kiosk, wildlife viewing blind, and portable restrooms at trailheads and partner to develop trail links and pedestrian crossings. Routinely evaluate facility impacts on wildlife.

Summary of CCP Objectives and Strategies	
SAFETY	
Staff Safety	*Objective:* • All Refuge staff will receive orientation/training. *Strategies:* • Develop orientation and first aid training that addresses key Refuge safety issues. • Develop site-specific appendices to the Refuge Complex Safety Plan. • Within 1 year, develop a health and safety plan to cover all Refuge operations. • Implement a goal of zero incident performance.
Visitor Safety	*Objective:* • Within 5 years, 75% of visitors will be aware that the Refuge is safe and open for public access before they arrive. Upon arrival, these visitors will be informed of public use opportunities and restrictions. • Brief all participants in guided programs about site history. *Strategies:* • Provide maps and interpretive signage with restriction information at all access points/trailheads. • Help potential users understand site restrictions and public use opportunities through a diversity of media. • Provide information to map/ tour book publishers. • Survey visitors to check success of safety program. • Maintain law enforcement and ensure employees can educate visitors on safety issues. • Measure program success by a reduction in visitors who violate safety rules.
OPEN and EFFECTIVE COMMUNICATION	
Outreach	*Objective:* • Within 5 years, implement 4 methods of informing the public. *Strategies:* • Reach out to local communities and recruit participants. • Measure diversity of groups attending outreach events. • Utilize a variety of outreach communication methods. • Take part in stewardship programs and local meetings.

Summary of CCP Objectives and Strategies	
WORKING WITH OTHERS	
Emergency	*Objective:* • Within 1 year, create emergency response agreements with relevant parties. *Strategies:* • Meet annually, or as often as needed, to coordinate fire and emergency response plans. • Coordinate all prescribed burning and other restoration practices with all nearby agencies.
Conservation	*Objective:* • Meet annually (at minimum) with local entities to address conservation issues. *Strategies:* • Work closely with surrounding open space and natural resource entities. • Use volunteers to help with conservation activities. • Partner to maintain wildlife corridors for wildlife that migrate seasonally to and from the Refuge.
Research	*Objective:* • Make a list of habitat, wildlife and public use research needs; evaluate proposals for such research. *Strategies:* • Establish criteria to evaluate research proposals. • Emphasize research with implications for the Refuge. • Partner with other for research funding and resources.
Volunteers	*Objective:* • Within 3 years, create a volunteer program. *Strategies:* • Define volunteer opportunities, and recruit volunteers from horse and bike groups to help maintain trails. • Work to establish a Refuge "Friends" group.

Summary of CCP Objectives and Strategies	
REFUGE OPERATIONS	
Staffing	*Objective:* • Within 2 years, fund four employees and assign collateral duties for Rocky Mountain Arsenal staff. Within 5 years add 1 additional employee. • Fund two full-time and two seasonal employees from fire management funding. *Strategies:* • Follow Service protocols hiring of FTEs.
Operation and Management Facilities	*Objective:* • Within 5 years, develop 50% of operations and maintenance facilities needed to support public use and conservation objectives. By year 10, complete all operations and maintenance facilities. • Maintain the existing stock fence. *Strategies:* • Submit proposals to the Refuge Operations Needs System and Maintenance Management System. • Renovate existing vehicle search buildings and provide additional administrative offices for Refuge employees within the contact station. • Prepare a fire cache and install necessary water storage systems. • Coordinate equipment sharing with RMA staff. • Attach boundary signage to the perimeter fence. • Install roadside signs along the site boundary in order to announce the Refuge's presence. • Construct a small maintenance/storage facility (approximately 1750 – 2250 square feet).
Cultural Resource Management	*Objective:* • Develop a cultural resource preservation plan. • Stabilize and interpret the Lindsay Ranch barn. *Strategies:* • Maintain an inventory of all cultural resources. • Pursue partnerships to fund barn stabilization. • Fence and/or take down the Lindsay Ranch house to prevent a safety hazard. • Work with interested parties to interpret the story of homesteading at Rocky Flats. • Survey burned areas for cultural artifacts.

4.3. ENVIRONMENTAL CONSEQUENCES SUMMARY

The CCP will pose a variety of benefits and impacts to the resources of the Refuge. Many of the greatest environmental benefits will be the result of road removal and revegetation, weed management practices, and habitat management strategies for the Preble's meadow jumping mouse. The greatest negative impacts to the resources will result from new facility development and visitor use. The environmental consequences of establishing and managing the Rocky Flats NWR in accordance with this CCP are summarized below. For a more detailed outline of impacts refer to table 9 at the end of the chapter.

Preble's Habitat Management

The maintenance, protection, and improvement of riparian and wetland habitat for Preble's will result in long-term benefits for a number of species that depend on riparian habitat. In addition, the maintenance of a vegetated buffer around watercourses will benefit the water resources of the Refuge. Furthermore, by providing a core reserve for these threatened animals, Preble's habitat management on the Refuge is likely to benefit populations on adjacent lands. Increased monitoring of Preble's habitat, however, may result in short-term, minor impacts to other riparian-dependent species. The potential exclusion of deer and elk from some of these riparian areas would further protect riparian communities. While monitoring the impacts of public use on riparian habitat and Preble's populations would provide long-term benefits, recreational monitoring alone may provide insufficient impacts for effective habitat management.

Grassland Management

Grassland management and weed management tools, including prescribed fire, grazing, and the restoration of 300 acres of disturbed grassland, could result in short-term impacts to the Refuge due to disturbance of the existing soil and vegetation structure. Effects of this disturbance could include localized erosion, individual wildlife impacts, localized air quality impacts due to prescribed fire, and potential visual impacts. However, all of the short-term effects of grassland management tools will result in long-term benefits by promoting more robust and sustainable native grassland communities. Improved and diversified habitat conditions will result in long-term benefits to a variety of wildlife species, including grassland birds and native burrowing mammals.

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Population control of deer and elk by CDOW and USFWS will benefit those species and the habitat they depend on.

Road Removal and Revegetation

By reducing habitat fragmentation and eliminating conduits for invasive weeds and predators, the removal and revegetation of unused roads and stream crossings will provide major long-term benefits to vegetation communities and related wildlife species. Throughout the Refuge, 28 miles of road will be removed and revegetated, and 13 stream crossings will be restored. While these changes will result in short-term soil disturbance and erosion, these short-term effects will be outweighed by the long-term benefits. Road removal and revegetation will provide 51 acres of additional habitat and will increase the Refuge's average habitat patch size to 93 acres. One animal species that should benefit from these changes is the threatened Preble's meadow jumping mouse, which inhabits riparian habitats directly affected by the restored stream crossings. In the long term, the Refuge's water resources should also benefit, through improved bank stabilization and stream channel vegetation. Finally, road removal and revegetation will have a direct positive impact on the visual resources of the Refuge, as road scars in the landscape fade from view.

Weed Management

The implementation of an Integrated Pest Management (IPM) plan will allow the Service to develop a targeted weed-management strategy that will benefit a variety of vegetation communities and native wildlife species. The chemical, biological, and mechanical tools employed to control weeds may have short-term adverse impacts for both plants and wildlife, but these impacts will be offset by the long-term advantages. For instance, by reducing competition from invasive weeds, weed management activities will enhance the quality and diversity of native vegetation communities, which will provide long-term benefits to a variety of native wildlife species. The inclusion of prescribed fire and grazing as restoration tools will provide further long-term advantages. Moreover, the benefits of weed management may extend beyond the Refuge borders, by reducing the spread of weeds in adjacent open space areas and by providing a source of information for regional weed management efforts.

Deer and Elk Management

Population control of deer and elk by CDOW and USFWS will benefit those species and the habitat they depend on. For instance, by monitoring deer impacts on riparian habitat, Refuge staff could identify excessive overgrazing and overbrowsing, and implement aggressive management activities to limit damage and benefit Preble's habitat. While culling and public hunting will directly impact individual animals that are killed, these practices should provide long-term benefits to deer and elk populations throughout the Refuge and on adjacent lands. The establishment of a five-year time-span for meeting the target population is an important factor in ensuring healthy populations and limiting habitat degradation. This carefully considered program of deer and elk management may provide environmental benefits in areas far from Rocky Flats, as it will add to the growing base of scientific information regarding wildlife management.

Prairie Dog Management

The Refuge has the potential to support many more prairie dog colonies and individuals than currently occupy the site. A healthy prairie dog population on the Refuge will provide a genetic base for the region if other populations are diminished by plague, predation, or other factors. The expansion of prairie dog colonies will be limited to 750 acres of suitable habitat on the Refuge. Excluding prairie dogs from riparian areas and xeric tallgrass communities, which are not suitable habitat, will benefit these communities. Prairie dog expansion could result in minor impacts to the existing soil and vegetation structure and some grassland wildlife species in expansion areas. Nevertheless, it will have a beneficial effect on wildlife and wildlife habitat by enhancing nutrient cycling and plant growth, and increasing habitat for other wildlife species that inhabit prairie dog colonies. For example, prairie dog expansion will improve foraging conditions for nearby bald eagles and other predators on the Refuge. Overall, a greater diversity of wildlife is expected with expansion of prairie dog colonies.

Species Reintroduction

Sharp-tailed grouse is a likely candidate for reintroduction to the Refuge. Species reintroduction would benefit wildlife diversity throughout the Refuge and on nearby open space lands and would result in increased wildlife viewing opportunities. Weed management activities and other planning would benefit these reintroduced

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The use of blinds and overlooks, as well as guided interpretive visits, will help mitigate impacts to wildlife.

populations. Additionally, the ongoing reintroduction of native fish species in Rock Creek and the Lindsay Ponds (and potentially other creeks) will provide long-term benefits to the survival of these species by establishing a population in its native habitat that can be a source for future reintroductions to other foothills and plains streams.

Facility Development

In the short term, the development of new trails and facilities will result in localized soil disturbance and erosion from construction, with corresponding impacts to water resources though erosion and sedimentation. Soil loss from new facilities will occur on 1.1 acres, and soil disturbance will occur on 1.7 miles of newly constructed trail. In the long term, trail use and off-trail use near streams may result in some bank destabilization and erosion. New trails and facilities will directly impact existing vegetation and indirectly impact vegetation in places adjacent to development sites, resulting in 4.8 acres of impacted vegetation. The development of trails and facilities on the Refuge, however, will provide real benefits to the public by complementing, but not duplicating, recreational opportunities available on nearby open space lands. Trails and trailheads will also benefit the connectivity of the regional trail system, though they will not provide a direct link to Boulder County trails to the north.

Public Use

Trail use throughout the Refuge may adversely affect wildlife by creating a new disturbance that disrupts wildlife movement and fragments some habitat areas. Off-trail use will pose minor impacts to vegetation due to trampling, social trails, and dispersal of weeds. In addition, new trails are likely to function as conduits for predators and weeds. On the other hand, some of these intrusions could benefit deer populations by increasing deer movement, which may result in improved genetic diversity. In riparian areas, use of trails may result in minor impacts to the Preble's meadow jumping mouse. The trails, however, do not follow riparian areas for extended distances and these impacts will be mitigated by seasonal trail closures. In general, short-term impacts to wildlife, such as changes in behavior, foraging habits or physiology, will apply to individuals rather than populations or communities. For smaller species including birds, small mammals, reptiles, and insects, the presence and ongoing use of a trail will likely result in minor localized adverse impacts by creating a barrier to movement and the availability of nearby habitat (Meaney et al. 2002; Dickerson 2003; Miller and Knight 2001). Visitors engaging in wildlife photography and observation can cause short-term impacts to wildlife due to the long duration of their behavior (Knight and Cole, 1995; Weir 2000). The use of established blinds and overlooks, as well as guided interpretive visits, will help mitigate these impacts.

Trail disturbance to large, broad ranging species such as mule deer and elk will result in minor adverse impacts due to changes in movement patters and abandonment of certain concentration areas. Public hunting will result in direct impacts to some individuals and will introduce a new disturbance. The minor impacts of hunting will be offset by the long-term benefits of improved population dynamics (migration and dispersal) on the Refuge and in surrounding habitat areas.

Research

Habitat related research would benefit vegetation and habitat management refuge-wide and regionally. Short-term wildlife disturbances from research and monitoring would be offset by improved knowledge of wildlife management.

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Table 9. Summary of Environmental Consequences

	Environmental Consequences of the CCP
GEOLOGY and SOILS	
Deer and Elk Management	Population control will reduce potential for soil erosion due to overgrazing.
Prairie Dog Expansion	May result in increased soil erosion. These impacts may be offset by the increased nutrient cycling and soil stability provided by prairie dog colonies. Effects up to 750 acres.
Mixed Prairie Grassland Management	Restoration of hay meadow and other disturbed areas will result in short-term soil disturbance and long-term benefits.
Road Restoration and Revegetation	Road removal will result in short-term soil disturbance and erosion. Long-term benefits of revegetation will offset the short-term effects.
Public Use and Maintenance Facilities	New trails and facilities will result in localized soil disturbance and erosion during construction, and long-term impacts from use.
WATER RESOURCES	
Preble's Habitat Management	Protection and maintenance of riparian habitat and vegetated buffer will benefit water resources.
Weed Management	Localized, short-term erosion may occur following prescribed fire or grazing.
Road Restoration and Revegetation	Road removal Refuge-wide may result in short-term impacts due to sedimentation, and long-term benefits due to improved bank vegetation, stream channel, etc.
Public Use	Trail use and off-trail use near streams may result in bank destabilization and erosion. Facility construction may result in short-term impacts due to erosion and sedimentation.
VEGETATION COMMUNITIES	
Deer and Elk Management	Population management by CDOW and vegetation monitoring will benefit vegetation by reducing impacts of overbrowsing/ overgrazing. Benefits will be increased by the 5-year target population timeframe.
Prairie Dog Management	Prairie dogs may impact some plant communities. Exclusion of prairie dogs from riparian and xeric tallgrass habitat Refuge-wide will benefit these communities.
Preble's Habitat Management	Maintenance, protection, and improvement of riparian and wetland habitat will benefit those communities. - Exclusion of ungulates will benefit riparian habitat. - Monitoring recreation impacts only may provide insufficient information for effective riparian habitat management.
Xeric Tallgrass Conservation	Management planning and regional conservation efforts will benefit xeric tallgrass community. Benefits will be Refuge-wide.
Mixed Grassland Prairie Management	Restoration of hay meadow and other areas will benefit grassland communities.

	Environmental Consequences of the CCP
VEGETATION COMMUNITIES ***(continued)***	
Road Restoration and Revegetation	Road removal will benefit vegetation communities Refuge-wide by reducing fragmentation. Removal of stream crossings may result in short-term impacts to wetlands and riparian habitat, with long-term benefits. Will result in: – 45 acres of additional habitat – Average patch size of 98 acres
Weed Management	Weed management efforts will benefit vegetation communities Refuge-wide. – Chemical, biological, and mechanical control may have short-term adverse impacts that would be offset by long-term benefits. Benefits may be reduced by lack of grazing as a management tool. – Benefits may be increased because of Refuge-wide use of prescribed fire and grazing.
Public Use Facilities	New trails and facilities will directly impact vegetation and indirectly impact adjacent vegetation. Impacts include: – 2 acres of impacts to xeric tallgrass grassland – 2.6 acres of mixed grassland
Off-trail Use	Minor impacts to vegetation due to trampling, social trails, and weed dispersal.
Public Use Monitoring	Monitoring impacts of public use on riparian habitat will provide long-term benefit.
Regional Coordination	Coordination with adjacent landowners will benefit vegetation through better management.
Research	Habitat-related research will benefit vegetation and habitat management.
WILDLIFE	
Native Fish Reintroduction	Will provide long-term benefits to fish populations and survival rates.
Sharp-tailed Grouse Reintroduction	Management planning and weed management efforts will benefit grouse reintroduction efforts.
Deer and Elk Management	Population targets will be realized within 5 years, providing moderate benefits. – Culling and hunting will impact animals due to mortality or stress, will provide long-term benefits. – Monitoring will be minimum necessary for effective population management.
Preble's Habitat Management	Habitat protection will benefit other riparian wildlife species. Minor impacts to riparian wildlife species due to Preble's monitoring.
Prairie Dog Management	Colony expansion could result in long-term impacts to vegetation structure and local extirpation of some species. Effects will be limited to 750 acres.

	Environmental Consequences of the CCP
VEGETATION COMMUNITIES ***(continued)***	
Road Restoration and Revegtation	Road revegetation will benefit various wildlife species Refuge-wide.
Vegetation and Wildlife Monitoring	May result in short-term impacts (disturbance/displacement) to individual animals.
Xeric Tallgrass Management	Efforts Refuge-wide may have short-term adverse impacts to wildlife and long-term benefits due to habitat enhancement.
Mixed Grassland Prairie Management	Restoration of disturbed areas may impact some resident wildlife; will result in long-term habitat benefits to wildlife.
Weed Management	Various management tools have the potential to cause direct mortality or injury to individual animals. Impacts will be offset by long-term benefits of improved habitat.
Public Use	Trail use throughout the Refuge may adversely affect wildlife in the following ways: - Creating a new disturbance that may disrupt wildlife movement and fragment habitat areas. - New trails may provide a conduit for predators and weeds. - Short-term stress and adjustment for mule deer; followed by long-term benefits of increased deer movement that may improve genetic diversity and decrease habitat impacts.
Regional Coordination	Coordination with other land managers will improve wildlife and habitat management.
Research	Short-term wildlife disturbance will be offset by improved knowledge of wildlife management.
Fence Removal	Removal of unnecessary interior stock fencing will benefit wildlife species by facilitating open movement through Refuge.

	Environmental Consequences of the CCP
THREATENED, ENDANGERED and CANDIDATE SPECIES	
Grouse Reintroduction	Grouse habitat management will benefit Preble's habitat, provide additional eagle prey; may conflict with prairie dog habitat management.
Deer and Elk Management	More aggressive population management could benefit Preble's by reducing overbrowsing.
Prairie Dog Management	Colony expansion will be limited to 750 acres. Expansion will benefit prairie dogs and improve foraging for bald eagles, but could impact Preble's habitat.
Preble's Habitat Management	Exclusion of grazing from habitat may have moderate benefits to Preble's. Monitoring could lead to short-term disturbance. Habitat management may benefit bald eagle foraging perches.
Road Restoration and Revegetation	Revegetation of unused roads and stream crossings will benefit all species.
Weed Management	Short-term habitat impacts from management tools followed by long-term habitat improvements.
Public Use	Trail development and use in riparian areas may impact Preble's (mitigated by seasonal closures). Facility development may impact prairie dogs and associated foraging habitat for eagles.
CULTURAL and HISTORIC RESOURCES	
Lindsay Ranch	Stabilization efforts would benefit barn, but value of house would be lost.
OPEN SPACE, RECREATION and TRAILS	
Wildlife Management	Species reintroductions and deer and elk population management on the Refuge may result in long-term benefits to wildlife populations and wildlife viewing opportunities on adjacent open space lands.
Preble's Habitat Management	Refuge could provide a core reserve for Preble's and other species that would benefit populations on adjacent open space lands.
Vegetation Management	Efforts such as xeric tallgrass management planning, and regional collaboration could benefit adjacent open space areas by improving knowledge and coordination.
Weed Management	Weed reduction efforts on the Refuge could benefit adjacent open space by reducing spread of weeds and increasing management knowledge.
Recreation Opportunities	Recreation programs will compliment but not duplicate opportunities on nearby open space lands.
Trail Facilities	Trails and trailheads will benefit the regional connectivity of trails, but would lack a direct connection to Boulder trails.

	Environmental Consequences of the CCP
VISUAL RESOURCES	
Deer and Elk Management	May reduce visual impacts of overgrazing/overbrowsing.
Prairie Dog Management	Colonies will be a visual impact to some, a benefit to others. Effects will be limited to 750 acres of the Refuge.
Prescribed Fire	Short-term visual impacts associated with smoke and burned areas from prescribed fires.
Grazing	May result in short-term visual impacts; though some may consider livestock to be a benefit for landscape views.
Road Removal and Revegetation	Revegetation will benefit visual aesthetics Refuge-wide.
Mixed Grassland Prairie Management	Revegetation will likely cause short-term visual impacts followed by long-term benefits.
Public Use Facilities	May result in minor visual impacts.
NOISE	
Deer and Elk Management	Occasional gunshots associated with culling and public hunting may be audible from within Refuge, but would not impact overall noise levels.
Excavation and Construction	Heavy equipment for road restoration and facility development would result in short-term noise impacts in nearby areas.
TRANSPORTATION	
Highway 93	Contribution of Refuge traffic to Highway 93 will be much less than pre-Refuge conditions. Will not warrant a traffic signal, but existing acceleration/deceleration lanes will be beneficial.
Highway 128	No impacts from trailhead location. Potential trail crossing at McCaslin would require pedestrian signals.
Indiana Street	Potential pedestrian crossings should include warning signs for safety. Recommended locations are north of Walnut Creek, and south of Woman Creek.
AIR QUALITY	
Dust and Emissions	Equipment usage will result in short-term localized emissions and fugitive dust.
Prescribed Fire	Will result in short-term increases in particulates and decreased visibility nearby.

	Environmental Consequences of the CCP
SOCIOECONOMICS	
Staffing	Staffing levels will have no impact on regional employment, income or housing conditions.
Community	Change from past use to Refuge will benefit community perceptions of Rocky Flats.
Environmental Justice	No adverse effects on minority or low-income populations, or Native Americans.