BOBCAT RIDGE
Natural Area
Management Plan

May, 2005

City of Fort Collins
Natural Areas Program
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Executive Summary

Bobcat Ridge Natural Area was acquired by the City of Fort Collins Natural Areas Program on December 16, 2003 for a purchase price of $5.3 million from the Pulliam Marital and Charitable Trusts. At the time of purchase, Bobcat Ridge represented the largest contiguous natural area owned and managed by the Natural Areas Program at 2,600 acres. This property was also the first "regional lands" purchase made by the city's Natural Areas Program under the Land Conservation and Stewardship Master Plan, which was unanimously adopted by Fort Collins City Council on July 20, 2004.

In every way, Bobcat Ridge Natural Area property exceeds all criteria for a natural area. The property is home to significant biological and ecological resources, rich cultural and human history, abundant interpretive opportunities, and extraordinary opportunities for recreation. This management plan documents the ecological, cultural, and recreational resources, and suggests ways to maintain and enhance these resources while offering compatible educational and recreational opportunities. Proper stewardship will be achieved when habitat and wildlife values are maintained or enhanced through time.

Management of Bobcat Ridge Natural Area offers many new challenges to the Natural Areas Program including: livestock grazing, management of fire-prone areas, habitat management for large herds of deer and elk with associated herd management and hunting pressure, and maintaining controlled access over a large backcountry area. In this document the Natural Areas Program outlines specific goals and management recommendations for Bobcat Ridge.

A summarized review of all management recommendations may be found in Chapter 9. The recommended management actions listed in this document are subject to available funding and organizational capacity.

Chapter 1
Introduction and Background

1. Site Significance

Bobcat Ridge Natural Area encompasses 2,606 acres of foothills grasslands, shrublands, and pine forests just west of Masonville, Colorado (T6N R70W portions of sections 15, 16, 17, 18, 20, 21, 22, and 27). Geographically, Bobcat Ridge is near other preserved public lands including Devil's Backbone Open Space, managed by Larimer County and the Roosevelt National Forest. There are also three separate in-holdings within the natural area totaling 160 acres managed by the US Forest Service. At the time of purchase in 2003, Bobcat Ridge Natural Area was the largest contiguous natural area managed by the Natural Areas Program.

Bobcat Ridge Natural Area's diverse habitat, abundant wildlife, natural scenery and rich cultural history make this site a welcome addition to the Natural Areas Program's land conservation inventory. This site meets all of Fort Collins City Council-"Approved Natural Area Acquisition Considerations" (Appendix 1), and was a high priority acquisition target identified by the Natural Areas Program's Land Conservation and Stewardship Master Plan adopted unanimously by Fort Collins City Council on July 20, 2004. The Colorado Division of Wildlife has documented significant populations of elk, mule deer and turkey, in addition to mountain lions and black bears which utilize portions of the natural area. Plant community diversity at Bobcat Ridge stems from the elevation gradient that rises from the eastern hogbacks and valley grasslands at 5,000 feet elevation, to the foothills ecosystem dominated by ponderosa pine and Douglas fir forests on the property's western edge at 7,000 feet elevation. The mixture of plant communities are further diversified as the result of drainages, rolling topography and cliffs.

2. Purchase and Interim Management

Bobcat Ridge Natural Area was acquired by the City of Fort Collins Natural Areas Program on December 16, 2003 for a purchase price of $5.3 million from the Pulliam Marital and Charitable Trusts. Prior to and just following acquisition of the property, an interim stewardship analysis was developed to help guide activities while this management plan was being drafted. The following actions have been implemented since that time including:

- extending the property grazing lease through the fall of 2005
- leasing the existing home site to current occupant through Dec 31, 2005
- halting all activities related to salvage logging in the burned area
- posting signs, installing gates, and marking boundaries to restrict public access
- initiating routine ranger patrol to safeguard the area
- completing an ecological inventory with Colorado Natural Heritage Program
- beginning bird surveys with Fort Collins Audubon Society
- completing a cultural resource survey
- mapping existing roads, structures and other features to create a base map
- removing unnecessary fences and general cleaning up
- conducting public preview field trips and gathering feedback
- installing a portable restroom at the site entrance

3. Geographic Context

Bobcat Ridge Natural Area is located just west of Masonville town-center and Larimer County Road 27. This site falls within the Foothills/Redstone/Buckhorn regional Conservation Focus Area as identified in the Natural Areas Program's Land Conservation and Stewardship Master Plan completed in 2003. This property was identified for its high quality habitat and scenic resources. Its location, shown in Figure 1.1, provides direct ecological connectivity to Roosevelt National Forest to the west, which in turn is contiguous with Rocky Mountain National Park, and to 3,500 acres of protected foothills (Sylvan Dale Conservation Easement) to the south. This connectivity provides protected transitions from lower elevation grasslands to the foothills ecosystems, higher elevation montane, subalpine and alpine environments. The acquisition of Bobcat Ridge Natural Area serves to preserve one of the few remaining relatively unfragmented landscapes of Colorado's Front Range.

Immediately to the north, east, and south, much of the land is developed as rural subdivisions with 5 to 35-acre lots; some with ranches, small farms and quarries. One and a half miles east of Bobcat Ridge are Devil's Backbone and Rimrock Open Spaces managed by Larimer County. Along with Coyote Ridge Natural Area, these lands combine to protect 3,500 acres of grasslands and agriculture.

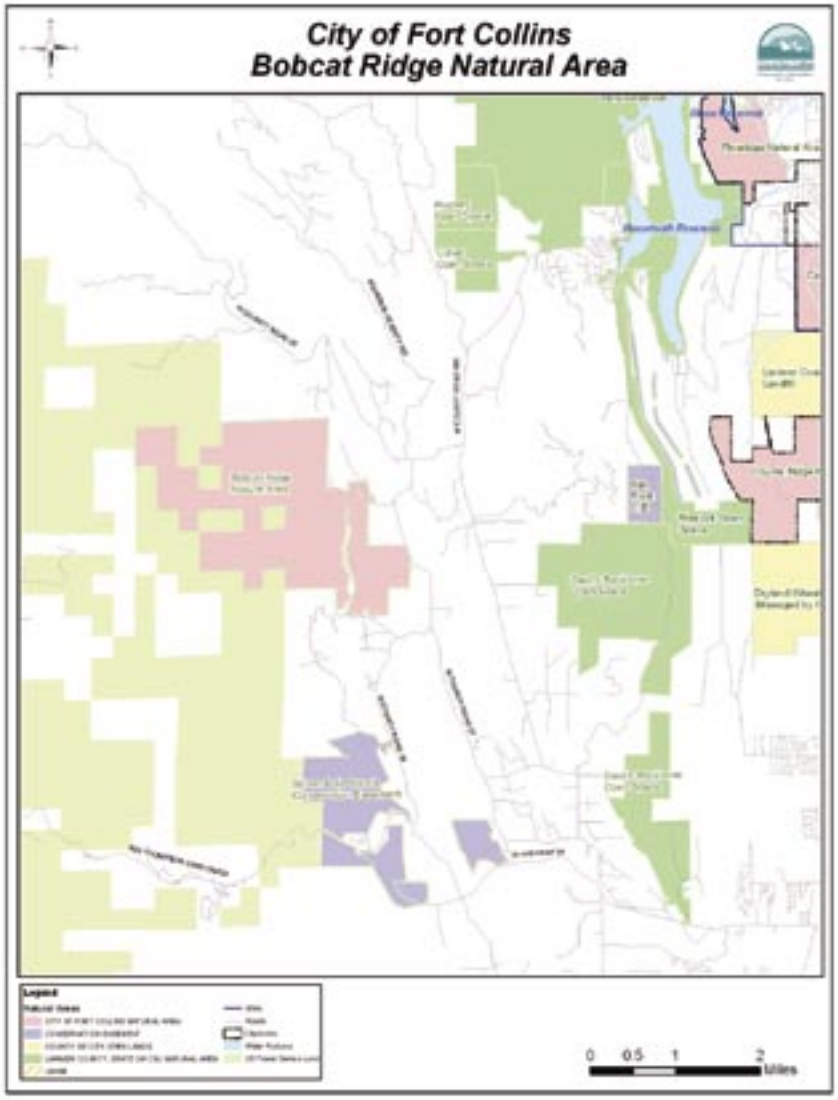

figure 1.1

There may be opportunities to conserve nearby lands in the future. The not yet developed areas to the north and east have a high potential to be subdivided into 35 acre lots, or clustered into rural developments following Larimer County's Land Use Code. Reasonable commuting distances to Loveland, Fort Collins, and the appeal of country living make this area a highly desirable place to live.

Bobcat Ridge is not located contiguously to any existing trail networks. However, there may be opportunities to work with the US Forest Service on trail connections onto Forest Service lands in the future.

4. Land Use History

The presence of two likely tipi rings and a small collection of artifacts from the site reveal that Native American people probably camped or occupied Bobcat Ridge Natural Area prior to European settlement. Today's presence of abundant big game further suggests this area may have been productive hunting grounds.

European settlement of the area occurred in the late 1800's. Bobcat Ridge and the surrounding lands were used for farming and grazing throughout the homestead period in Northern Colorado. Agriculture was the primary economic focus of the area's early settlers. Known homestead sites on Bobcat Ridge include the area of Mahoney Park, the standing historic cabin in the northeast corner, and the existing ranch house at the entrance of the property. The Pulliam family, who last owned and operated the property, has farmed and leased this land for cattle grazing, alfalfa, wheat production and hunting since 1961. Following the Bobcat Gulch Fire of 2000 the property also was informally leased for salvage logging.

5. Scope of the Management Plan

This management plan describes significant natural, cultural, recreational and educational resources for Bobcat Ridge Natural Area. Based on an inventory of existing conditions, ecological and cultural resources specific recommendations for wildlife and habitat protection and visitor use are proposed. Chapters Two through Six detail the physical, ecological, cultural, and recreational resources of the property; Chapter Seven discusses the educational opportunities; Chapter Eight describes various administrative elements and start-up activities. Chapter Nine presents the action plan, outlining the management actions necessary to properly steward the site consistent with the Natural Areas Program mission. These actions will be executed as funding and organizational capacity allows.

6. Public Outreach

In the summer of 2004, the Natural Areas Program began a concerted effort to introduce the public to Bobcat Ridge Natural Area. The first step in our community outreach effort was to offer staff-led public field trips which began in June and continued through October. More than 125 citizens attended and completed a feedback form concerning specific management questions (Appendix 2). Members of the City of Fort Collins Natural Resources Advisory Board, Parks and Recreation Board and the Trails Committee visited Bobcat Ridge during that same time and provided similar input.

Three public open houses were held in 2004. The first was held on July 1 which targeted local neighbors of Bobcat Ridge. Two additional public open houses held on November 17, and December 3 for the public, staff and citizen advisory boards. Comments and feedback from those open houses are in Appendix 3.

Staff also consulted with the Colorado Division of Wildlife, Northern Colorado Water Conservation District, Roosevelt National Forest, Lory State Park, EDAW Inc., Larimer County Planning staff, Larimer County Sheriff and Emergency Services Office, Loveland Rural Fire District, City of Fort Collins Historic Preservation Office, Tatanka Historical Associates, Rocky Mountain National Park and the Colorado Natural Heritage Program in the development of the interim stewardship analysis and this management plan.

Chapter 2
Physical Resources

The physical resources analyzed at Bobcat Ridge Natural Area include topography, geology, soils, hydrology, and scenic vistas. Recommendations in subsequent chapters are based in part on the capabilities and limitations of the physical resources listed here.

1. Topography

The topography of Bobcat Ridge Natural Area is varied; mountains, cliffs, rolling terrain, drainages and flat valley areas are all found within the landscape of this natural area. Forested hills covered by ponderosa pine and Douglas fir reach to over 7,000 in feet elevation and dominate the western section which comprise of Green Ridge. The valley section of the property consists of open, flat grasslands and agricultural areas. The elevation of the valley bottom ranges from 5,500 feet on the west to 5,400 feet on the east side. Hogback ridges made up of red sandstone cliffs on the natural area's eastern edge rise to an elevation of 5,600 feet and create two unique canyons that cut through the hogback and drain eastward. Buffum Canyon is located on the north end and provides the main access to the site. Brooks Canyon located to the south is ecologically vibrant canyon rich in plant and wildlife diversity. The varied topography of Bobcat Ridge is indeed the source of the site's scenic and biological resources.

2. Geology (Braddock, et al. 1970)

The geology of Bobcat Ridge varies widely across both space and time. Different formations dating from the Precambrian era and up to the Quaternary period are found here. In general, the geologic formations are older on the western, mountainous areas of Green Ridge. Younger formations are found directly east along the hogback ridges.

Green Ridge is entirely Precambrian era metamorphic Tonalite and metasedimentary rock. Tonalite is light gray and varies from medium-grained, equigranular to fine-grained, porphyritic (large crystals embedded in a finer-grained matrix). The mineralogy of the metasedimentary rock varies with metamorphic grade. Within Bobcat Ridge these rocks are primarily quartz-feldspar schist and gneiss, and mica schist and gneiss.

The valley floor was formed in the Fountain Formation (Carboniferous period) overlain by Quaternary era alluvial fan deposits. The Fountain Formation is a red and minor gray, coarse-grained sandstone with lenses of siltstone and fine-grained sandstone. Alluvial fan deposits consist of material washed off of Green Ridge and deposited within the many west-east drainages that cross the area's valley.

As the valley floor rises to form the hogback ridge, the Fountain Formation can be seen on its western slopes as exposed red cliffs. Moving eastward, the top of the hogback is made up primarily of the Permian period Ingleside and Satanka Formations. The Ingleside Formation consists of red calcareous, fine - to medium-grained, well-sorted, cross-bedded sandstone while the Satanka Formation consists of red siltstone and fine-grained sandstone. These formations form the red cliffs visible on the higher elevations of the hogback and in Buffum and Brooks Canyon. Lyons

Sandstone dating to the Permian period covers the eastern-most slopes of the hogback and is made up of red and pink fine- to very fine-grained, well-sorted, cross-bedded sandstone.

Recommended Actions for Geologic Resources:

- Do not allow rock climbing on fragile, easily erosive rock cliffs.
- Assess site for potentially appropriate rock climbing area.

3. Soils (Moreland 1980)

The soils on Bobcat Ridge Natural Area vary depending on location and underlying geology. Valley soils are quite complex with varying slopes, soil textures, and series classification. Soils formed on Green Ridge are less complex, as are soils on the hogback since these areas are erosional rather than the depositional soils of the valley (Figure 2.1).

Green Ridge Soils

The upper elevations of Green Ridge are dominated by Wetmore-Boyle gravelly sandy loam mixed with rock outcrop with areas of Elbeth-Moen loams and Breece coarse sandy loam. The latter is found in areas such as Mahoney Park. These soil types are shallow, stone, occur on very steep slopes that exhibit rapid runoff, and are highly erosive. These soils may withstand limited grazing under a well planned grazing system that is directed toward maintaining adequate plant cover. There are severe limitations to recreational use and building site development mainly due to high angle slope, and shallow depth of bedrock. The Natural Resources Conservation Service recommends that these areas are primarily suited for native grasses and woodlands for wildlife habitat. The lower slopes of Green Ridge are dominated by stony or cobbly sandy loam Haploborolls mixed with rock outcrop. These soils have similar capabilities and limitations as those mentioned above.

The Bobcat Gultch Fire in 2000 denuded the vegetation on the Green Ridge area. Subsequent rainfalls caused much erosion of the exposed soils and nearby drainages. Aerial seeding efforts of the burned area by the U.S. Forest Service have successfully created a ground cover of grasses. However, the area is still unstable and erosion potential is high. An assessment of areas with high erosion potential is needed and those areas should be stabilized to reduce soil loss.

Valley Soils

The soils found in the valley bottom at Bobcat Ridge display a very complex distribution. They are primarily loams of the Kirtley-Purner complex and Satanta series. Areas of Connerton-Barnum complex, Harlan and Purner fine sandy loams and other minor series are mixed throughout. Slopes range from nearly level to strongly sloping with slow to rapid runoff. Soils on the western section of the valley tend to have severe limitations that make them generally unsuited for cultivation due to the severe erosion hazard and are primarily suited to pasture and native grasses for wildlife habitat. Soils on the eastern section of the valley tend exhibit severe limitations related to erodability that restrict the choice of cultivated plants, requires special conservation practices, or both. Under irrigated conditions these soils support wheat, barley, corn, sugar beets or beans. In dryland conditions they are best suited to pasture or native grasses.

Valley soils present few limitations with regards to recreational uses, however engineering designs for trails, structures, or other improvements may need to be made to account for high, shrink-swell potential, corrosiveness and general low strength of heavy-textured soils.

Hogback ridge soils

Soils on the hogback on the eastern edge of Bobcat Ridge are a mixture of rock outcrop, loamy soils of the Purner series and Haplustolls or Baller soils ranging from stony sandy loam to loam in texture. Slopes are generally steep with vertical cliffs present on portions of the rock outcrop. Runoff in this area tends to be rapid exhibit a severe erosion hazard. These soils are primarily suited to native grasses and wildlife habitat. Limited grazing under a well planned grazing system that emphasizes the protection and maintenance of plant cover may be tolerated. Hogback soils present severe limitations to recreational use and building site development primarily due to slope, depth to bedrock and presence of large surface stones.

Recommended Actions for Soil:

- Complete a grazing plan that is directed toward maintaining adequate plant cover to limit erosion on green ridge and hogback ridge soils.
- Carefully engineer trails on valley soils to account for high shrink-swell potential, corrosiveness and general low strength of heavy-textured soils.
- Complete soil assessment prior to construction of public improvements
- Complete soil assessment prior to restoration work.
- Assess areas with high erosion potential to prevent further erosion and improve water quality.

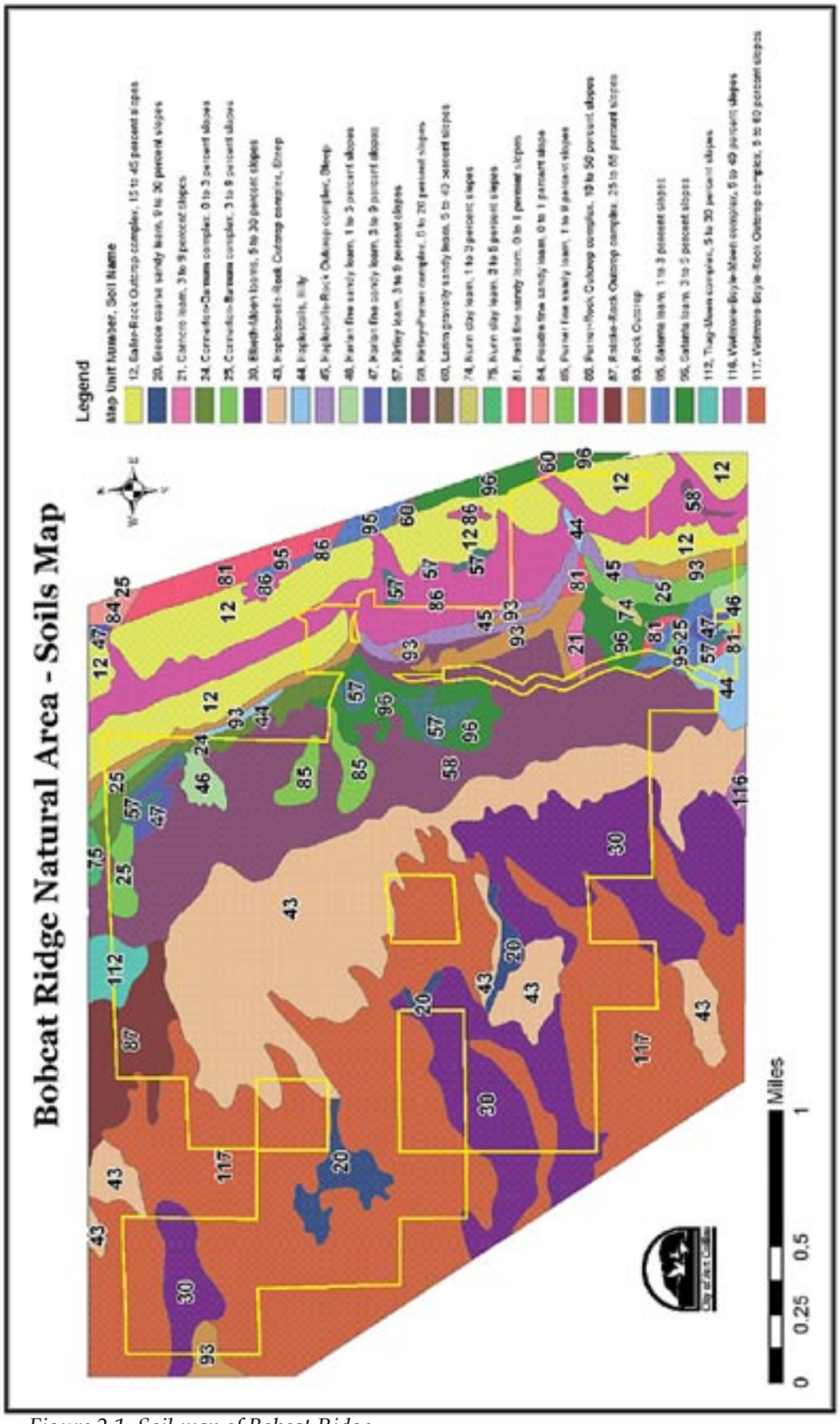

Figure 2.1. Soil map of Bobcat Ridge.

4. Hydrology/Water Resources

Bobcat Ridge lies within the Buckhorn Creek watershed, which in turn is nested within the larger Big Thompson River watershed. The contribution of Bobcat Ridge to Buckhorn Creek in terms of surface runoff is minimal. However, its contribution to groundwater dynamics may be more significant as there are a number of springs located on the property.

The hydrologic system on Bobcat Ridge includes several springs, two ephemeral streams and a small irrigation-fed pond. The Hansen Feeder Canal, although concrete lined, may play a part in the hydrologic system at Bobcat Ridge. The known springs on Bobcat Ridge can be found in and around the Mahoney Park area. One of these, on the northeastern side of Mahoney Park, feeds a small earthen-dammed detention pond used for watering livestock. Another, on the western side of the park, feeds wetland seeps among the rock outcrops. This same spring flows underground across Mahoney Park and resurfaces on the eastern side where it is used to supply a livestock watering tank. A third, located in the major drainage just south of the park, has been excavated out of the side of the hill to create a watering area for livestock. It is unclear whether this third spring would have produced surface water historically or just manifested itself as a seep within a wetland vegetation complex. Other springs may be found on Bobcat Ridge with further investigation.

There are two ephemeral stream networks on Bobcat Ridge Natural Area. The northernmost collects several drainages including those containing the known springs in and around Mahoney Park. This stream course cuts the hogback ridge forming Buffum Canyon before continuing on to Buckhorn Creek. The southernmost stream network collects two major drainages and a handful of smaller ones before cutting the hogback to form Brooks Canyon and continuing on to join Buckhorn Creek. Surface water is present in this stream course in Brooks Canyon; however, it is unclear as to whether this water is the result of a naturally occurring spring, spillover from a irrigation pipe fed by a siphon off the Hansen Feeder Canal, or seepage coming directly from the canal.

A small retention pond exists on the western edge of the valley just north of the Powerline Road. This pond is primarily fed with irrigation water pumped over from the Hansen Feeder Canal, leased to the ranchers (lessee of the city). The pond would also capture surface runoff from three minor drainages during heavy precipitation events or during the spring melt. The pond lies within the Buffum Canyon stream network although its role in the overall hydrology is unclear since there is no surface flow coming out of it.

The Hansen Feeder Canal is a concrete lined ditch that is part of the Horsetooth Reservoir supply network. The canal is owned and operated by the Northern Colorado Water Conservancy District. Water from this canal is used to supply the retention pond mentioned above as well as a stock tank located west of the head of Brooks Canyon. Although it is lined some leakage may occur and contribute to the hydrology of Bobcat Ridge. The location(s) and extent of this contribution are uncertain at this time.

Recommended Actions for Hydrologic Resources:

- Assess the hydrologic systems to better understand sources of wetlands and drainages.
- Restore dammed drainages to ensure continued and natural hydrology of wetlands and drainages.

- Rehabilitate eroded drainages that were damaged by heavy rains following the 2000 Bobcat Gulch Fire. Establish sufficient ground cover over the burned areas for greater infiltration and reduction of sediment laden runoff.
- Design trails to keep people away from canal and post signs that canal area is closed to public.

5. Scenic Resources

This area serves as a scenic resource for visitors to the area. Bobcat Ridge Natural Area is clearly visible from the top of Horsetooth Mountain and many of the other surrounding ridges (mostly privately owned). Not only does Bobcat Ridge serve to preserve a continuous scenic landscape when viewed from afar, but the varied topography, geology, and plant communities found on the property provide a scenic and aesthetic resource for visitors to the natural area (Figure 2.2). Currently, a private small aircraft landing strip at the crest of the hogback on neighboring property and the Denver International Airport flight path over the property can affect the peaceful, scenic resource at times. Wildfires, residential development and expanded quarrying operations are all potential future negative impacts to the scenic and aesthetic values of this natural area.

Figure 2.2. Looking northeast toward Horsetooth Mountain (left) and east toward Milner Mountain (right).

Recommended Actions for Scenic Resources:

- Limit vehicle travel on site in order to reduce noise and improve air quality.
- Achieve state and local air quality standards during any management actions such as prescribed burning for long-term air quality and visibility of scenic resources.
- Investigate burying the power line through the grassland/meadow area of the natural area.
- Design trail to provide scenic vistas of the unbroken landscape within the natural area.
- Aquire a conservation easement on adjacent lands.

Chapter References

Braddock, W. A., R. H. Calvert, S. J. Gawarecki, and P. Nutalaya 1970. Geologic map of the Masonville quadrangle, Larimer County, Colorado. U. S. Geologic Survey, Washington D.C.

Moreland, Donald C. 1980. Soil survey of Larimer County area, Colorado. U. S. Dept of Agriculture, Washington D.C.

Chapter 3
Vegetation

In this chapter we describe the various plant and vegetation resources found at Bobcat Ridge. This includes a discussion of plant communities, rare plants, and system factors including ecological processes that give rise to the vegetation composition and distribution within the natural area. In the summer of 2004, the Colorado Natural Heritage Program (CNHP) was contracted to conduct a biological survey of Bobcat Ridge Natural Area for the purpose of identifying native plant communities and ecosystems present that are of conservation concern. Much of the following section is adapted from their report (Doyle 2004).

1. Plant Communities and Ecosystems

Ecosystems are defined as dynamic assemblages of plant and animal communities that occur together on the landscape. They are unified by similar ecological processes such as climate moderated by elevation, natural disturbance processes and/or underlying abiotic factors and gradients such as bedrock geology and hydrology.

Native plant communities at Bobcat Ridge Natural Area occur within five ecosystems as shown in Figure 3.1 and Table 3.1. There is one wetland ecosystem: Lower Montane Riparian Woodland; and four upland ecosystems: Ponderosa Pine Woodland, Ponderosa Pine Savanna, Lower Montane-Foothills Shrubland, and Foothills Grassland. In each of these ecosystems several native plant community associations occur. Rare plant communities within these ecosystems are also listed in Table 3.1.

The Ponderosa Pine Woodland ecosystem is located at the highest elevations on the slopes and high points along Green Ridge in the western part of the property. This area was severely altered by the Bobcat Gulch wildfire in 2000 that burned 1,000 acres of forest within Bobcat Ridge Natural Area. At lower elevations on the east- and south-facing slopes of Green Ridge, the Ponderosa Pine Woodland grades into the Ponderosa Pine Savanna, a mosaic of shrubs, grasses and scattered trees. The valley between Green Ridge and the hogbacks to the east has remnants of a Foothills Grassland ecosystem. The majority of this ecosystem has been converted to agricultural land use or has been degraded by grazing. The Lower Montane-Foothills Shrubland ecosystem is found on the sandstone hogbacks that run along the east side of Bobcat Ridge. The Lower Montane Riparian Woodland ecosystem is located along stream drainages, some of which have intermittent surface flow.

Figure 3.1. Map of plant communities and ecosystems at Bobcat Ridge.

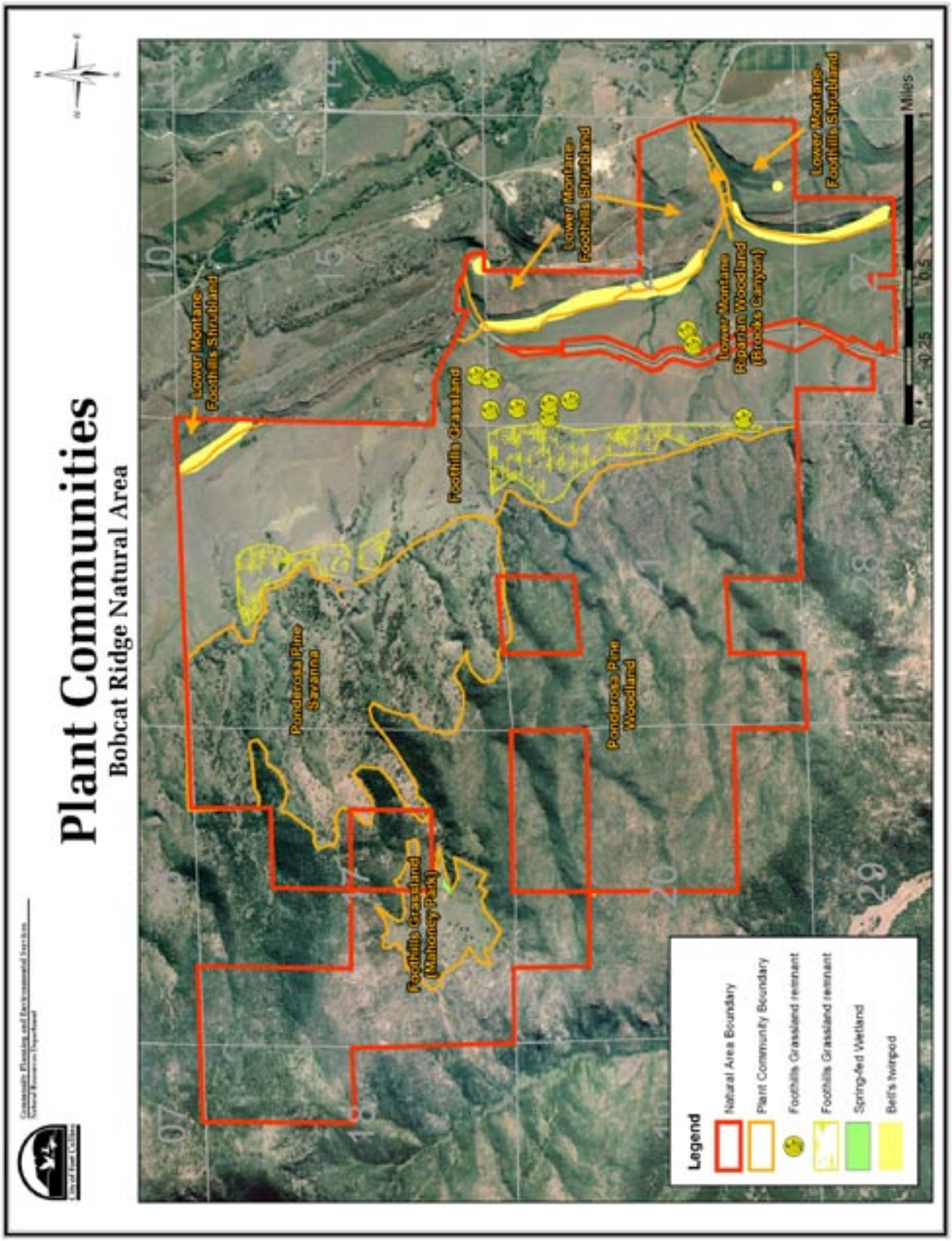

Table 3.1. Rare plant communities at Bobcat Ridge Natural Area

Upland Plant Ecosystems	Rare Plant Communities	CNHP State Ranking
Ponderosa Pine Woodland	*Pinus ponderosa/Leucopoa kingii* Ponderosa pine/spike fescue	Vulnerable
Ponderosa Pine Savanna	*Pinus ponderosa/ Cercocarpus montanus/ Andropogon gerardii* P. pine/mountain mahogany/big blue stem	Imperiled *
Lower Montane-Foothills Shrubland	*Cercocarpus montanus/ Stipa scribneri* Mountain mahogany/scribner needlegrass	Vulnerable*
	Cercocarpus montanus/ Stipa neomexicana Mountain mahogany/New Mexico feathergrass	Imperiled/vulnerable*
Foothills Grassland	*Stipa comata/Bouteloua gracilis* Needle-and-thread/blue gramma	Imperiled/vulnerable
Riparian Plant Ecosystems		
Lower Montane Riparian Woodland	*Populus angustifolia /Prunus virginiana* Narrow-leaved cotoonwood/chokecherry	Critically imperiled

*Plant community was found to be intact and cover a significant enough area to be considered an element occurrence by the CNHP. See the 2004 Inventory of Larimer County by the Colorado Natural Heritage Program for more details.

A. Woodland and Savanna

Woodland and Savannas occupy about 70% of the land area at Bobcat Ridge Natural Area. The Bobcat Gulch Fire of 2000 burned approximately two-thirds of the forested area on the property. The forest consists mostly of ponderosa pine *(Pinus ponderosa)* with some Rocky Mountain maple *(Acer glabrum)*. The burned area contains a mix of well-established native grasses and patches dominated by various weedy species (Figure 3.2). In the areas with an open canopy (savannas), a large part of the understory consists of cheatgrass *(Bromus tectorum)*. However, pockets of mountain mahogany *(Cercocarpus montanus)* and big bluestem *(Andropogon gerardii)* in the understory of ponderosa pine comprise a plant community ranked as globally imperiled by the Colorado Natural Heritage Program.

Figure 3.2. Burned area of Woodland at Bobcat Ridge.

Ponderosa Pine Woodland

The Ponderosa Pine Woodland ecosystem is the most common found in the foothills and montane elevations (6,000-9,000 feet) along the Front Range. Ponderosa pine grows on warm dry slopes, is intolerant of shade, and grows well in full sun from bare mineral soil. These trees are the dominant species on dry slopes, but they are interspersed with Douglas fir *(Pseudotsuga menziesii)* on moister, north-facing slopes. Historically, these ecosystems likely sustained frequent, low intensity fires and sporadic catastrophic (i.e. stand-replacing) burns (Huckaby et al. 2003, Shinneman and Baker 1997).

The Bobcat Gulch Fire was one such catastrophic, large natural disturbance in the Ponderosa Pine Woodland ecosystem on Bobcat Ridge Natural Area. Most of the trees in this ecosystem were killed by the severe crown fire, even in usually protected steep drainages and north-facing slopes. A site visit made on August 13, 2004 with US Forest Service researcher Laurie Huckaby revealed that widespread surface fire had occurred at least two times at Bobcat Ridge during the last 200 years. The majority of tree mortality occurred in what is likely a single stand of ponderosa pine dating to the early 1900's. This suggests that, historically, the current Ponderosa Pine Woodland was more characteristically a Ponderosa Pine Savanna. Unusual climatic events (perhaps an extended wet period) likely promoted the regeneration and growth of ponderosa pine across Bobcat Ridge into a more closed-canopy forest condition.

In the 2000 fire, much of the understory was consumed or lost to erosion following denudation. Understory regeneration may have been suppressed by emergence of early successional weeds (e.g. mullein *(Verbascum thapsus)*) or plants from post-fire seeding measures undertaken by the US Forest Service. Aerial seeding of the area included species such as slender wheatgrass *(Elymus trachycaulus)*, sandberg bluegrass *(Poa secunda)*, milk vetch *(Astragulus spp.)*, mountain brome *(Bromus marginatus)*, mountain muhly *(Muhlenbergia montana)*, Arizona fescue *(Festuca arizonica)*, and Parry's oats *(Danthonia parryi)*.

Only small vestiges of what was likely present prior to the fire are recognizable. Ponderosa pine and spike fescue *(Leucopoa kingii)* occupy several ridgetops at higher elevations. Spike fescue is considered an indicator of late successional forest stands within this ecosystem (Tirmenstein 1987). Pockets of spike fescue have survived on several ridgetops and slopes at the outer edges of the fire at the north end of the property. These areas are currently threatened by the invasion of cheatgrass, especially notable as monotypic circles around trees that burned. It is difficult to assess whether spike fescue occurred on adjacent ridges to the south in the severely burned area. Otherwise, the Ponderosa Pine Woodland ecosystem can be seen to have a typical species composition, with Geyer's sedge *(Carex geyeri)* locally abundant in areas of the understory where it is not out-competed by cheatgrass. North-facing slopes are co-dominated by ponderosa pine and Douglas fir forming relatively dense, closed canopy forests.

No ponderosa pine seedlings were noted in the severe burn area during the 2004 inventory. However, seedlings were seen in the less severely burned areas. Ponderosa pine seed germination is reduced by moisture stress, such as that from the drought conditions that have persisted since the fire. Competing vegetation also decreases germination (Burns and Honkala 1990). Future fire management at Bobcat Ridge is being addressed as part of the comprehensive restoration plan (prescribed fire). Wildfire operations falls under the jurisdiction of the Loveland Rural Fire District. All wildfires at Bobcat Ridge will be suppressed.

Conservation Target	Ponderosa Pine Woodland
Objectives	*Allow natural regenerative processes to restore portions of the forest while aggressively controlling invasive weeds and undertaking proactive restoration efforts to reduce erosion and enhance the native character.*
Natural Processes/ Functions/ Interactions	High frequency – mixed severity fire is the dominant ecological process.
Threats & Stresses (Source of Stress)	• High intensity rainstorms leading to severe erosion. • Introduction and establishment of weeds, especially cheatgrass. • Additional high intensity wildfires due to unnatural surface fuel buildup (invasion of cheatgrass together with downed woody material).
Strategy/Action	• Stabilize eroding soils. • Prevent the introduction and spread of invasive weeds. • Prevent further catastrophic fire from post-fire fuel buildups. • Enhance wildlife habitat
Measure of Success	Successful mitigation of eroded areas. Reduced area of invasive species.
Conservation Plan	• Complete a site restoration plan. • Complete a grazing plan • Inventory severe erosion locations and implement management measures to reduce soil loss. • Aggressively control invasive species. Monitor routinely to detect new invasions. • Develop prescribed fire management plan to reduce probability of high intensity surface fires; contain the spread should one ignite. • Determine historic range of variability of forest density and disturbance regime. • Create patches of meadows to attract native browsers. • Determine utilization of burned area by woodpeckers, flickers, nuthatch and similar species for cavity nesting, feeding, etc. • Monitor re-establishment of ponderosa pine seedlings.

Ponderosa Pine Savanna

The Ponderosa Pine Savanna ecosystem consists of widely spaced ponderosa pine trees with grassland parks or shrublands. It occurs at relatively lower elevations and on somewhat rockier substrates, making this ecosystem moderately drier than the Ponderosa Pine Woodland ecosystem. The main plants associated with this ecosystem are ponderosa pine, mountain mahogany and big bluestem. This plant association is found at the ecotone between forests on higher slopes and grasslands in valley bottoms, combining elements of each. Unique in this association is the presence of big bluestem, a species that abundantly occurs in the tallgrass prairie of the Plains states to the east, but is much less common in the Foothills. Patches of big bluestem are scattered throughout the savanna approximately between 5,960 and 6,440 feet on the east-facing slopes of Green Ridge. At higher elevations in this range, this association tends to occur on more south-facing aspects.

Much of the savanna sustained low intensity surface fire during 2000. Some trees were torched and shrubs and grasses were top-killed by the fire. Mountain mahogany is resprouting from root bases and several native grasses are abundant. Big bluestem, like many native grasses, is well-adapted to fire (Uchytil 1988). There is an abundance of fringed sage *(Artemisia frigida)* following the 2000 fire. This species and certain other early successional colonizers (e.g. mullein) will likely decrease in abundance over time. However, cheatgrass is abundant and dominant in many areas and may persist and expand if not addressed.

Conservation Target	Ponderosa Pine Savana
Objectives	*Enhance habitat value and native character through restoration efforts designed to eradicate weeds and maintain the system through periodic natural disturbance.*
Natural Processes/ Functions/ Interactions	Seasonal grazing and periodic fire and drought are natural processes that sustain native grasslands. A June 2004 wildfire on 10 acres of grassland and woodland resulted in the conversion of non-native ground cover to native grasses and forbs.
Threats & Stresses (Source of Stress)	• Invasion by non-native like cheatgrass and Canada thistle. • Lack of natural disturbance.
Strategy/Action	• Locate remnant grassland patches to determine restoration targets including species diversity and abundance. • Use a combination of targeted cool-season and dormant season grazing, prescribed fire, and enhancement seeding to convert non-native areas to native.
Measure of Success	Reduced areas of non native species and increase of native species, specifically the ponderosa pine, mountain mahogany, big bluestem plant community.
Conservation Plan	• Complete a site restoration plan using remnant native grassland patches as a reference. • Monitor vegetation recovery from the 2004 burn; implement early season prescribed burning if area continues to demonstrate native plant recovery. • Use prescriptive grazing to reduce cool season, non native species like cheatgrass. • Introduce small scale prescribed burns to reduce the abundance of widespread non-native species. • Once desired condition is achieved, proactively manage to mimic periodic natural disturbance processes (i.e. grazing, fire).

B. Shrubland

The hogback area at Bobcat Ridge is covered in shrubs with exposed cliff faces and comprises about 5% of the area (Figure 3.3). Shrublands are also found in the transition between woodlands and grasslands on the west side of the valley. Shrubs across the site are mostly native and include mountain mahogany, rabbitbrush *(Chrysothamnus viscidiflorus)*, three-leaf sumac *(Rhus trilobata)*, and plum thickets *(Prunus americana)*.

Figure 3.3. Shrubland on hogback ridge.

Lower Montane-Foothills Shrubland

The Lower Montane-Foothills Shrubland ecosystem occupies the sandstone hogback that extends along the east side of the property. The expression of this ecosystem on Bobcat Ridge Natural Area is a mosaic of mountain mahogany with Scribner needlegrass *(Stipa scribneri)* and New Mexico feathergrass *(Stipa neomexicana)*. Shrublands with New Mexico feathergrass form sizable patches within the more common Scribner needlegrass at this site. Native grasses are diverse and dominant in the understory beneath mountain mahogany, including Indian ricegrass *(Achnatherum hymenoides)*, purple threeawn *(Aristida purpurea)*, side-oats grama *(Bouteloua curtipendula)*, blue grama *(Bouteloua gracilis)* and sand dropseed *(Sporobolus cryptandrus)*. The rare Bell's twinpod *(Physaria bellii)* occurs throughout this shrubland ecosystem.

Cheatgrass is problematic within this extensive stretch of habitat. It is creeping up from the pasture and hayfields below as well as colonizing patches at higher elevations just below the cliffs where rocks have fallen from the eroding bluffs causing localized disturbance.

Conservation Target	Foothills Shrubland
Objectives	*Enhance habitat value and native character by restoration of native plant understory (grasses and forbs) through aggressive weed control.*
Natural Processes/ Functions/ Interactions	Grazing, drought and fire historically interacted to form the shrubland and its grassland understory. While the shrub communitiy is intact, the understory has been severely altered by non-native cheatgrass.
Threats & Stresses (Source of Stress)	• Non prescriptive grazing. • Weed invasion.
Strategy/Action	• Use grazing to help eliminate cheatgrass problems. • Aggressive weed control.
Measure of Success	Increase in percent coverage and in diversity of understory native species.
Conservation Plan	• Complete a restoration plan. • Complete a grazing plan. • Target early spring cattle grazing to eliminate non native and invasive species such as cheatgrass and Canada thistle. • Use of herbicides and other methods must not impact the native shrubs. • Attempt to control cheatgrass with fall herbicide treatments of 2 oz/acre application of Plateau. • Once established, routine grazing or periodic fire may be used to maintain disturbance regime and health of the ecosystem.

C. Grasslands and Croplands

Figure 3.4. Montane grassland in Mahoney Park.

Grasslands and croplands comprise about 25% of the acreage at Bobcat Ridge Natural Area. The valley portion of Bobcat Ridge harbors a mix of native grassland remnants and areas that have been modified by agricultural practices. Alfalfa *(Medicago sativa)* and wheat have been actively cropped for decades; perhaps a century or more. Today, many of the fields are irrigated with NCWCD water allowing the ranchers (who lease water rights) to complete an average of two rotations of hay per year. Much of the grassland and cropland area is threatened by undesirable species such as smooth brome *(Bromus inermis)*, Canada thistle *(Cirsium canadensis)* and cheatgrass.

Montane grasslands interspersed with ponderosa pine in the area of Mahoney Park were once in crop production, which has reverted to cheatgrass and will require aggressive weed control (Figure 3.4).

Foothills Grassland

Figure 3.5. Foothills grassland in valley bottom.

The Foothills Grassland ecosystem occupies the deeper soils over siltstone and fine-grained sandstones in the valley bottom of Bobcat Ridge Natural Area (Figure 3.5). It is also found in Mahoney Park. The Foothills Grassland is one of the most severely altered ecosystems in the Southern Rocky Mountains ecoregion (Rondeau 2001). Prior to conversion to agriculture and construction of the canal, the valley was probably fully occupied by a mix of mid- and tallgrass plants, remnants of which are now relegated to shrubland, mountain parks and edges of the ponderosa pine forest. Patches of this ecosystem still exist in the valley on rocky knolls that were likely too difficult to plow. The deeper soils of the swales and rolling hills were plowed and planted in hay crops and pasture grasses like crested wheatgrass *(Agropyron cristatum)*, quackgrass *(Elytrigia repens)*, and alfalfa. The remnant patches of native species have a vastly different composition dominated by blue grama, needle-and-thread *(Stipa comata)*, sand dropseed, and fringed sage. Other diverse forbs also occur. These patches of native species are not without weeds like cheatgrass, but native species are dominant.

Conservation Target	Foothills Grassland
Objectives	*Enhance habitat value and native character through restoration efforts designed to eradicate weeds and convert hay crop and pasture grasses to native grasses.*
Natural Processes/ Functions/ Interactions	Seasonal grazing, periodic fire and drought are natural processes that sustain native grasslands.
Threats & Stresses (Source of Stress)	• Active haying operations/ a century of agriculture. • Non-native and invasive species like cheatgrass and Canada thistle. • Lack of natural disturbances.
Strategy/Action	• Locate remnant grassland patches to determine restoration targets including species diversity and abundance. • Use a combination of targeted cool-season and dormant season grazing, prescribed fire and enhancement seeding to convert non-native areas to native.
Measure of Success	Increase in percent of area converted from pasture to native grasses
Conservation Plan	• Complete site restoration plan using remnant grassland patches as a target. • Complete a grazing plan. • Cease most crop agriculture activities with one exception: the 18 acre alfalfa pasture where the grasshopper sparrows are nesting. Delay first cutting of alfalfa until mid August to accommodate fledging and foraging. • Investigate and better understand the habitat needs of grasshopper sparrows in the hay fields. • Target cool-season or dormant-season grazing to reduce cool-season no-native species like cheatgrass. • Introduce small-scale prescribed burns to reduce abundance of widespread non-native species. • Once desired conditions are attained, proactively manage to mimic natural disturbances.

D. Riparian/Wetlands

Riparian areas and wetlands comprise less than 1% of the land area on Bobcat Ridge Natural Area. As in most places in the west, wet areas are extremely valuable to native plants and wildlife.

Figure 3.6. Riparian area in canyon through .

Riparian and wetland areas on Bobcat Ridge predominately occupy hillside drainages and seeps that support diverse plant communities and the wildlife that depend on them. There are no known year-round springs on the valley sections; however, three springs exist on the mountain section. Brooks Canyon has a small ephemeral spring feeding the creek that runs out to County Road 27(Figure 3.6). In this narrow canyon, a mature cottonwood gallery consisting of three species of native cottonwoods combines with an understory of native plants to comprise one of the highest quality habitats on the natural area. Hillside drainages also support communities of rare butterflies.

Two artificial ponds were created on the site by small dams. These block and drain the water into stock tanks. One is at the eastern edge of Mahoney Park just north of the Powerline Road. Wetland plants such as Nebraska sedge *(Carex nebrascensis)*, spikerush *(Eleocharis spp.)* and duckweed *(Lemna spp.)* are growing at the edge of this pond. The second, larger pond is between Powerline Road and the North Road further downhill and to the east.

Lower Montane Riparian Woodland

The Lower Montane Riparian Woodland ecosystem occupies the immediate area adjacent to stream drainages throughout Bobcat Ridge Natural Area. Skunkbush sumac, willows *(Salix spp.)* and cherries *(Prunus spp.)* are common at the higher elevations coming down from Green Ridge. Where there is sufficient water flow at lower elevations, narrow-leaved cottonwoods *(Populus angustifolia)* emerge in the draws. This ecosystem is best expressed along Brooks Creek, an ephemeral stream, as it flows through the canyon and cliffs that form a break in the hogback chain on the east side of the property. Stately cottonwood galleries consisting of three species: plains *(Populus deltoides)*, lanceleaf *(P. x acuminata)* and narrowleaf *(P. lanceolatum)*, line a good portion of this stream reach. Chokecherry *(Prunus virginiana)* and American plum *(P. americana)* form shrub groves in the understory. The herbaceous layer throughout the various drainages on Bobcat Ridge Natural Area is strongly dominated by weedy perennials with very little of the native flora expected in undisturbed riparian corridors. Canada thistle and smooth brome are the biggest threats. Smooth brome is strongly dominant along Brooks Creek. In some places within the Front Range foothills this is a result of planting. However, altered hydrology (usually a lowered water table) combined with heavy grazing pressure, compromises the competitive edge of native species and allows smooth brome to invade from adjacent pastures (Carsey et al. 2003).

There are numerous drainages that run from west to east providing water to this community. The riparian corridor in the Brook's Canyon drainage may also be fed by an irrigation outlet. This needs to be further investigated to determine the source of the water. Stock water tanks located in the upper reaches of these drainages back-up water cutting off the natural supply to the drainage area below. These require further investigation. Restoration of the hydrology will need to occur parallel with aggressive weed control. Of particular concern is Dalmatian toadflax *(Linaria dalmatica)* which was observed during the site inventory. Cattle grazing in these areas add additional pressure on this ecosystem which, due to weed content, has already lost some resiliency. For this reason it is recommended that cattle grazing be carefully managed in the lower elevation riparian corridors.

Conservation Target	**Lower Montane Riparian Woodland**
Objectives	*Maintain and enhance vegetative quality of this natural community through restoration of natural hydrology and weed eradication.*
Natural Processes/ Functions/ Interactions	Hydrology is the sustaining function in this ecosystem.
Threats & Stresses (Source of Stress)	• Non-native and invasive species (Canada thistle and smooth brome) • Inappropriate cattle grazing • Compromised hydrology such as stopped drainages and water tanks
Strategy/Action	• Pursue aggressive control of Canada thistle and smooth brome. • Identify the source of the hydrology and restore natural flows. • Carefully manage cattle grazing in this community.
Measure of Success	Improved quality of the vegetation condition.
Conservation Plan	• Complete restoration plan. • Complete a grazing plan. • Pursue aggressive weed control of Canada thistle and smooth brome. • Monitor for invasion of Dalmation toadflax and eradicate. • Investigate the source of the water for Brook's Canyon and restore hydrology. • Evaluate impact of stock tanks and possibility of restoring natural water flow to lower elevation riparian areas. • Carefully manage cattle grazing from riparian areas throughout site; use wildlife friendly fencing. • Explore other opportunities to restructure the pasture layout within the landscape.


Figure 3.7. Bell's twinpod (Physaria belli) (left) and habitat (right) - hogbacks of red sandstone of the Ingleside Formation.

(Colorado Natural Heritage Program photos by Georgia Doyle)

2. Rare, Threatened or Endangered Plants

Bell's twinpod (Physaria bellii)

Bell's twinpod, a globally imperiled plant, grows at Bobcat Ridge Natural Area (Figure 3.7 and for locations see Figure 3.1). This small, yellow-flowered mustard occurs on sparsely vegetated red sandstone outcrops of the Fountain and Ingleside Formations found on the western slopes of the hogbacks. The Fountain Formation consists of red and minor gray, coarse-grained sandstone with lenses and layers of siltstone and fine-grained sandstone and the Ingleside Formation is comprised of red calcareous fine- to medium-grained, well-sorted, cross-bedded sandstone (Braddock et al 1970).

Bell's twinpod is known only from the foothills of the Front Range of Colorado (Larimer, Boulder, and Jefferson counties) and has been documented primarily on the limestone and shale of the Niobrara Formation. Recent work has verified that this rare plant also occurs on the Fountain and Ingleside Formations. Other nearby properties with outcrops of these formations that support Bell's twinpod populations include Devil's Backbone Open Space, and Horsetooth Mountain Park.

The dominant community on the hogbacks is mountain mahogany shrubland with a variety of native grasses. Bell's twinpod is most abundant where the vegetation is sparse at the top of the slope and in ephemeral drainage channels. The meadows at the base of the slopes are dominated by non-native grasses including smooth brome and cheatgrass. These non-native grasses occupy the lower portions of the hogback slope, likely decreasing the potential habitat for Bell's twinpod.

Conservation Target	Bell's Twinpod
Objectives	*Maintain and enhance existing population. Enhance conditions that perpetuate this species.*
Natural Processes/ Functions/ Interactions	Plant is most abundant where vegetation is sparse at the top of hogback slopes and in ephemeral drainage channels.
Threats & Stresses (Source of Stress)	• Non-native and invasive species like cheatgrass, smooth brome, and Canada thistle. • Effects of cattle grazing on this species are not understood.
Strategy/Action	• Aggressive weed control around known occurrences. • Remove cattle grazing from and enhance Bell's Twinpod habitat. • Maintain and enhance population of Bell's Twinpod.
Measure of Success	Self-sustaining population with successful recruitment.
Conservation Plan	• Control weeds aggressively around known occurrences to reduce the threats from non native and invasive species like cheatgrass, smooth brome, and Canada thistle. • Limit cattle grazing in these areas until it can be determined what effect grazing has on the species. • Monitor populations every 3-5 years and provide periodic updates to CNHP's element occurrence tracking system.

3. Weed Management

Weed management at Bobcat Ridge Natural Area will follow current City of Fort Collins Natural Areas Program Vegetation Management Guidelines. This includes an integrated pest management approach to noxious and invasive plant species. In accordance with the Colorado Noxious Weed Act, plants will be managed as specified by their placement in one of three categories on the Colorado Noxious Weed List. Plants in category "A" are managed for eradication, category "B" plants are managed to contain the spread of infestations, and "C" category plants are managed where deemed appropriate by county weed districts. No species from category "A" occur at Bobcat Ridge Natural Area. Monitoring for these species is a priority and will continue on an ongoing basis. If any species from category "A" are found at Bobcat Ridge, management objectives and strategies will orient toward eradication. In addition to the species listed below, the Natural Areas Program will monitor and manage smooth brome and crack willow *(salix fragilis)* as undesirable species.

Colorado Noxious Weeds found on Bobcat Ridge

Category "B" species	Category "C" species
Bull thistle *Cirsium vulgare*	Common mullein *Verbascum thapsus*
Canada thistle *Cirsium arvense*	Cheatgrass *Bromus tectorum*
Dalmatian toadflax *Linaria dalmatica*	Field bindweed *Convolvulus arvensis*
Leafy spurge *Euphorbia esula*	Common burdock *Arctium minus*
Musk thistle *Carduus nutans*	
Scotch thistle *Onopordum acanthium*	

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Chapter 4
Wildlife

Bobcat Ridge Natural Area has several habitat types characteristic of the Colorado Front Range foothills which in turn supports a diversity of wildlife. Examples of significant species that are known to occupy Bobcat Ridge include: elk, deer, black bear, mountain lion, black-tailed prairie dog, golden eagle, grasshopper sparrow, and black-chinned hummingbird. The Moss's elfin butterfly and Townsend's big-eared bat are state-listed species of concern that are found at Bobcat Ridge. The natural area is also potential habitat for dusted skipper and rhesus skipper butterflies, tracked by the Colorado Natural Heritage Program (CNHP), and federally threatened Preble's meadow jumping mouse.

Maintaining and enhancing the diversity of wildlife requires careful management especially as the site is managed for visitor use. Bobcat Ridge provides important winter forage for elk, mule deer and wild turkey. The natural area also supports black bears and mountain lions which raises the potential for human-wildlife conflicts. It is imperative to carefully balance the location and timing of recreation in order to limit interactions.

A management decision that will impact wildlife is grazing. Consideration will be given to fence and stock tank design to help minimize injury or loss of wildlife. The location and design of fences will be adjusted to accommodate wildlife movement if necessary. Rescue ladders will be placed in all water stock tanks to assist small mammals and birds that may not otherwise be able to escape the tank.

The following sections provide specific conservation and management strategies for Bobcat Ridge's wildlife.

1. Mammals

There are a wide variety of mammals present in Bobcat Ridge Natural Area. Significant species known to be present on the site are listed in Table 4.1 below. Other species that may possibly occur in the natural area, based on their habitat requirements and the habitats present, are listed in Table 4.2. While these tables are not comprehensive, knowledge of the presence or likelihood of these species will assist in management decisions. A more complete list of mammal species at Bobcat Ridge Natural Area is in Appendix 4.

Table 4.1. Significant mammalian species present

Common Name	Scientific Name	Habitat Types*	Elevation Range (ft)	CDOW Status
American Elk	*Cervus elaphus*	2 - 6	6,000 –13,000	Big-Game
Mule Deer	*Odocoilus hemionus*	2 – 6	3,000 – 13,000	Big-Game
Coyote	*Canis latrans*	1 – 7	3,000 – 14,500	Furbearer
Red Fox	*Vulpes vulpes*	1 – 2 4 – 6	3,000 – 14,500	Non-Native Furbearer
Black Bear	*Ursus americanus*	2, 4 – 7	4,500 – 11,500	Big-Game
Mountain Lion	*Puma concolor*	2 – 6	3,000 – 12,500	Big-Game
Bobcat	*Lynx rufus*	2 – 7	3,000 – 14,500	Furbearer
Black-tailed Prairie Dog	*Cynomys ludovicianus*	1, 3 – 4	3,000 – 6,500	State Species of Concern
Townsend's Big-eared Bat	*Corynorhimus townsendii pallescens*	1,2,4,5	3,000 – 9,500	State Species of Concern

*Habitat Types:
1. Urban and Croplands
2. Riparian/ Wetlands
3. Grasslands
4. Shrublands
5. Forestlands
6. Tundra
7. Unvegetated, Exposed-Rock

Table 4.2. Significant mammalian species of possible occurrence

Common Name	Scientific Name	Habitat Types*	Elevation Range (ft)	CDOW Status
Gray Fox	*Urosycon cinereoargenteus*	2–5 & 7	5,500 – 13,000	Not-Listed
Western Spotted Skunk	*Spilogale gracilis*	4–5 & 7	4,000 – 8,000	Not-Listed
White-tailed Deer	*Odocoileus virginianus*	2–5	3,000 – 12,000	Big-Game
Yellow-Bellied Marmot	*Marmota flaviventris*	2 & 4–7	5,400 – 14,500	Small-Game
American Badger	*Taxidea taxus*	2–6	4,500 – 14,500	Furbearer
Preble's Meadow Jumping Mouse	*Zapus hadsonius preblei*	1-3	4,000-8,500	Federal and State Threatened

* Habitat Types: see footnote for Table 4.1.

A. Ungulates

Deer and elk routinely occupy most areas within Bobcat Ridge Natural Area. However, their specific densities, critical range and movement corridors require further investigation. Vegetative indicators of plant health need to be established to help monitor plant and community response to grazing by deer, elk and domesticated cattle. Similarly, conservation targets such as native grassland remnants should be actively monitored for the purpose of maintaining or improving health and condition.

Figure 4.1. Elk at Bobcat Ridge Natural Area.

Hunting and grazing may play a role in the management of resources at Bobcat Ridge. The interplay of grassland and forage resources, grazing by wild and domestic ungulates, and management actions will require more specialized planning, inventory, and monitoring to ensure proper stewardship of both the wildlife and habitat resources.

Conservation Target	Elk and Deer
Objectives	*Optimize habitat value and protect critical range(s).*
Natural Processes/ Functions/ Interactions	Species will prosper through reproduction, recruitment, and ability to disperse. Naturally occurring in a healthy ecosystem. The combined effect of regional habitat loss, reduced natural predation and increased competition and grazing intensity with domestic grazers act to negatively impact habitats.
Threats & Stresses (Source of Stress)	• Chronic Wasting Disease (CWD). • Competition for vegetative and water resources with cattle. • Disturbance from humans during critical times (e.g., calving season). • Migration corridors can become impeded by inappropriate or unnecessary fences, roads, or canals. • The absence of predation may stress the biological community through increased competition and grazing pressure from native species.

Elk and Deer chart continues on page 28

Strategy/Action	• Become familiar with CWD and its impacts. Research and inter-agency cooperation will be employed. • Manage both native and domestic grazing activities to ensure health of grassland and forage resources. Implement sound grazing practices to prevent overgrazing and protect water resources. • Identify and protect critical areas from unnecessary disturbance. Designate seasonal off-limit or limited-access areas where appropriate. • Identify and take informed corrective measures to avoid impeding animal movement. • Evaluate the relationship between cattle grazing and perpetuating healthy grassland and riparian plant communities. • Identify indicators for population threshold to best maintain a diverse and sustainable system.
Measure of Success	To be determined by estimating annual population densities, vegetative analysis, and hydrology disturbance.
Conservation Plan	• Monitor for animals exhibiting symptoms of CWD; work with CDOW to mitigate any outbreaks. • Determine the densities, distribution, and critical range of deer and elk. • Establish a monitoring plan to identify the dynamics of the ecosystem response to management decisions. • Implement corrective measures to protect habitat (e.g., riparian areas, remnant grasslands) before or as soon as degradation occurs. • Employ management measures to prevent disturbance during mating and calving seasons. • Identify movement/migration throughout the natural area. Remove unnecessary fencing to minimize impacts to species movement. • Identify critical indicators that would trigger the need to reduce herd number. • Enhance habitat condition by creating "patches" of grasslands (5 acres in size) within the burned forest matrix.

B. Black-tailed Prairie Dog

Recently, the black-tailed prairie dog was removed from the US Fish and Wildlife Service's Federally Threatened Species candidate list. Despite its removal from the federal list this species remains on the Colorado State Species of Special Concern list. Prairie dogs are a prey and habitat base for a suite of grassland wildlife. Educational information regarding these benefits should be part of the human experience when interacting with nature at this site. Location of trails or other activities should not interfere with opportunities for a healthy predator/prey relationship. The identified prairie dog colonies at Bobcat Ridge are shown in Figure 4.5.

Conservation Target	Black-tailed Prairie Dogs
Objectives	*Maintain stable populations that are balanced with other conservation targets.*
Natural Processes/ Functions/ Interactions	Species will prosper through reproduction, recruitment, and ability to disperse. Naturally occurring in a healthy ecosystem. The combined effect of habitat loss, reduced natural predation and increased competition and grazing intensity with domestic grazers reduces habitat quality.
Threats & Stresses (Source of Stress)	• Increase in animal densities and distribution could reduce available resources. • Bubonic plague, an introduced disease from Europe. • Poisoning or translocation resulting from human conflict. • Lack of native predators to help maintain stable population densities.
Strategy/Action	• Maintain stable populations through management of prairie dog population densities. • Identify locations of concern and monitor for unusual fluctuations in population density. • Educate people regarding the benefits of prairie dogs to the ecosystem. • Encourage or influence natural predation.
Measure of Success	To be determined by estimating annual population densities. Analysis of vegetative resource health would also help establish a benchmark from which to measure the level of success.
Conservation Plan	• Determine sustainable prairie dog densities and implement a plan to maintain the recommended numbers. • Determine intervention measures to be taken in the event of a plague epizootic. • Install educational interpretation regarding the benefits of prairie dogs to their environment. • Reduce disturbance and fragmentation of habitat and place predator enhancements where needed to encourage a balanced predator/ prey relationship.

C. Preble's Meadow Jumping Mouse

Portions of the Bobcat Ridge Natural Area fall within the Colorado Natural Heritage Program's Big Thompson River Potential Conservation Area (PCA). The Big Thompson River PCA identifies potential habitat for the Preble's meadow jumping mouse, a member of the Federally Threatened Species List. Although not currently documented at Bobcat Ridge, Preble's meadow jumping mice have been documented in nearby riparian areas at elevations from 5,085 to 7,400 feet (see Appendix 5 for a detailed description of the Big Thompson River PCA).

Habitat for this species consists of riparian vegetation dominated by willow (*Salix spp.*) with scattered stands of cottonwood (*Populus spp.*). Also found in these mesic habitats are snowberry (*Symphoricarpos occidentalis*), wild rose (*Rosa woodsii*), and mountain mahogany (*Cercocarpus montanus*). Stream banks have native sedges (*Carex spp.*) and rushes (*Juncus spp.*). Surrounding uplands are generally mid-grass prairie with stands of ponderosa pine (*Pinus ponderosa*). This habitat has been identified at Bobcat Ridge Natural Area (Figure 4.5).

In August 2004, the City's Natural Areas Program contracted with Jan Peterson, Ph.D. to conduct a trapping survey on city-owned portions of Buffum Canyon. From August 24 to August 28, 175 traps were laid out in two transects, one on each side of the stream. During the total of 700 trap-nights, 135 rodents were captured; 10 long-tailed voles (*Microtus longicaudus*), 18 Mexican woodrats (*Neotoma mexicana*), 97 deer mice (*Peromyscus maniculatus*), and 10 Northern rock mice (*P. nasutus*). No Preble's meadow jumping mice were detected at this site, however, the survey was limited to the immediate vicinity of CR 32C in Buffum Canyon, at the entrance and parking lot area of the site. The results are not applicable to any other area of Bobcat Ridge (see appendix 6 for the full survey report). Surveys of the potential habitats on the interior parts of Bobcat Ridge will need to be conducted.

The Colorado Natural Heritage Program has identified urban/rural development, recreational use, and management of water resources as the most likely threats to this species. Recreational use is heavy throughout the Big Thompson River PCA, and such impacts to riparian and upland grassland habitats could reduce jumping mouse abundance. The Preble's meadow jumping mouse has been shown to tolerate low levels of recreational use (hiking trails) in riparian communities, but such impacts should be mitigated to improve riparian shrubland and herbaceous cover.

In areas where creeks and streams no longer flow at historic levels the riparian habitat is reduced in size and density. Such water flow impacts can jeopardize the persistence of jumping mice by decreasing the amount of available riparian habitat. Maintaining historic flows or increasing the water table in such areas can restore the riparian vegetation and maintain jumping mouse abundance. Conservation of riparian areas in Bobcat Ridge will include restoring historic flows (removing stock tanks and other such impacts), as well as dealing with erosion from the burned area and cattle grazing in the riparian areas.

To ensure the persistence of jumping mouse populations, it is essential that development in and around riparian corridors provide both riparian and upland habitat for jumping mice. Jumping mice have been documented using upland habitats. It is possible that habitats lacking adjacent upland grassland are insufficient for local survival of the jumping mouse. Minimizing the extent to which riparian areas and adjacent upland habitats in Bobcat Ridge are impacted will ensure a suitable habitat remains available for the jumping mice should they return to the area.

Management strategies restricting impacts such as excessive grazing and compaction of soils near riparian systems will likely increase the possibility of jumping mouse populations. Grazing can restrict the expanse of riparian shrub communities, and thus, restrict the ability for Preble's meadow jumping mice to utilize the area. However, mild grazing pressure may not affect a population.

Conservation Target	Preble's Meadow Jumping Mouse (*Zapus hudsonius preblei*)
Objectives	*Optimize habitat quality of riparian areas and adjunct grasslands to encourage the establishment of native jumping mice.*
Natural Processes/ Functions/ Interactions	Species will prosper through reproduction, recruitment, and ability to disperse. Naturally functioning hydrology is essential in riparian areas.
Threats & Stresses (Source of Stress)	• Artificial manipulation of hydrology and/or overgrazing in these areas can expose a site to invasion by opportunistic weedy species. • Soil erosion and/or increased runoff from severely burned areas can negatively alter water quality and decrease bank stability.
Strategy/Action	• Restore natural hydrology to all drainages. This could include removal of stock tanks and implementing soil erosion prevention practices. • Eliminate grazing from riparian areas and buffer 100 feet back to provide for adjacent grassland. This may require some form of fencing to exclude cattle while the grazing lease is active. • Advance soil protection measures to ensure severely burned areas are not sediment loading drainages or eroding stream banks.
Measure of Success	Colonization of the area by Preble's meadow jumping mice would indicate success, though there are likely off-site factors (proximity to existing population, lack of migratory corridors, etc.) that may impede success of colonization.
Conservation Plan	• Survey specific potential habitat areas to be disturbed prior to any public improvement construction. • Determine the presence of jumping mice at interior locations of Bobcat Ridge. If not found, determine whether known mice populations would be able to colonize portions of Bobcat Ridge. • If occurrences of Preble's are documented or if migration corridors exist that would connect Bobcat Ridge with locations of known populations, investigate the functioning condition of riparian areas and adjacent grasslands on the property. • Inventory and examine the sources of hydrology (overland runoff, springs and seeps) to determine the extent of impacts that may be related to cattle grazing. Determine sources of erosion and erosion damage along drainages and stream banks. • If populations exist or are able to access Bobcat Ridge, restore natural hydrology to drainages, restrict grazing from riparian and adjacent grassland areas, and implement soil protection measures. • If a population were to become established, monitor and coordinate with the US Fish and Wildlife Service.

D. Carnivores

Coyotes, black bear, red fox, mountain lion and other species have been sited at Bobcat Ridge. It is highly probable that most of these species use Bobcat Ridge and adjacent areas as they have large home ranges. There are no known dens or other critical habitat features; however it is likely that some exist. Sensitive habitat such as these will be surveyed to ensure protection of the sites from human disturbance. An example of one possible site is a rocky outcrop near Mahoney Park that is referred to by locals as the "cat box." Seasonal wildlife closures of identified areas accompanied by buffer zones that protect predators, prey and visitors should be implemented. Education and enforcement of closure areas by staff rangers will be essential for the protection of wildlife and prevention of human conflicts.

Conservation Target	**Carnivores**
Objectives	*Optimize and protect habitat (e.g. den sites).*
Natural Processes/ Functions/ Interaction	Species will prosper through reproduction, recruitment and the ability to capture prey.
Threats & Stresses (Source of Stress)	• Unnecessary disturbance from human activities (e.g., recreation). • Habituation to human activities (e.g., trash). • Conflictive encounters with humans. • Absence of other native carnivores. • Reduction of available prey.
Strategy/Action	• Identify den sites and other sensitive areas. • Restrict or minimize human activities that could potentially lend themselves to habituation. • Inform recreational users and staff of potential for encounters with predators. • Identify prey species and protect their availability and accessibility for predators.
Measure of Success	May be determined by estimating annual population densities and analysis of behavioral response to increased human activities.
Conservation Plan	• Identify sensitive habitat and ensure its protection. • Strictly enforce regulations regarding "Leave No Trace." • Educate through interpretation (e.g., signage and pamphlets). • Allow and manage for returning predators to return. • Establish buffer zones and avoid fragmentation of areas where prey is abundant.

E. Bats

Townsend's big-eared bat has been observed on the property and is a species of special concern at the state and federal level. Other bats are likely to occur and hunt in the area. Roost and possible hibernation sites should be identified and protected, as all bats are considered species of concern. Working with other agencies, like the US Geological Survey (USGS), Colorado Bat Society (CBS) and Bat Conservation International (BCI) will assist in our efforts to protect sensitive habitat for these species.

Conservation Target	**Bats**
Objectives	*Optimize habitat value.*
Natural Processes/ Functions/ Interaction	Species will prosper through reproduction and ability to hibernate and migrate and are naturally occurring in a healthy ecosystem.
Threats & Stresses (Source of Stress)	Disturbance to roost sites from human activity.
Strategy/Action	• Become familiar with species that occupy the area, their habits and roost sites. • Protect existing and potential roost and hibernation sites
Measure of Success	May be determined by estimating annual population and species diversity.
Conservation Plan	• Work with the USGS, CBS and BCI to determine species and roost sites. • Identify and protect existing and potential roost and hibernation sites.

2. Birds

Bird surveys conducted between June and December 2004, found 91 species of birds at Bobcat Ridge Natural Area (see Appendix 7 for a more complete list. Note: the current list does not include spring migrants) indicating a wide variety of bird species. This may be attributed to the diverse habitats found at Bobcat Ridge. Each plant community playing a critical role in supplying breeding, nesting, and feeding grounds, or migration stop-over point.

Additionally, specific areas within each plant community may have special importance to known species or serve as potential habitat for new species. For example, the alfalfa field in the southeast corner of Bobcat Ridge supported a large number of grasshopper sparrows (Figure 4.2) which are likely nesting in the area. Likewise, the burn area of the 2000 Bobcat Gulch Fire produced a large number of standing-dead trees, supplying important habitat for primary and secondary cavity nesters. This area also has the potential to draw three-toed woodpeckers, a species considered "uncommon to rare" by expert ornithologists. The mountain shrub community found provides important habitat for a number of resident migratory species including bushtits, sage thrashers, and Wilson's warbler. Riparian corridors provide important nectar sources during the spring and fall migration of species like black-chinned and broad-tailed hummingbird *(Selasphorus platycercus)*. The cliff faces around the site serve as potential nesting habitat for white-throated swifts *(Aeronautes saxatalis)*, cliff swallows *(Petrochelidon pyrrhonota)* and a variety of raptors like golden eagles, red-tailed hawks, and prairie falcons.

Figure 4.2. Grasshopper sparrow. (photo courtesy of Cole Wild)

A list of noteworthy bird species (locally common species not shown) found at Bobcat Ridge is shown in Table 4.3. Table 4.4 provides a list of significant birds that may occur. Both lists are presented for consideration as management decisions are made and actions implemented. It is important to understand that these lists are not comprehensive and will be added to as further observations are made.

Table 4.3. Noteworthy bird species at Bobcat Ridge (not a complete list)

Group	Common Name	Scientific Name	Habitat Types*	Elevation Range (ft)	Nesting Preference
American Vultures	Cathartes aura	*Cathartes aura*	1 - 7	3,000 – 9,000 Breeding	Cliff Ledge
Kites, Eagles	Golden Eagle	*Aquila chrysaetos*	1 – 7	3,000 – 14,000 Year-round	Cliffs and Trees
Hawks	Sharp-shinned Hawk	*Accipiter striatus*	1 - 6	3,000 – 11,500 Year-round	Forest
	Cooper's Hawk	*Accipiter cooperii*	1 – 7	3,000 – 10,000 Migrant & Winter	Forest
	Red-tailed Hawk	*Buteo jamaicensis*	1 – 7	3,000 – 13,500 Year-round	Cliff
Falcons and Caracara	Prairie Falcon	*Falco mexicanus*	1 - 7	3,000 – 14,000 Year-round	Cliff
Grouse & Turkey	Blue Grouse	*Dendragapus obscurus*	1 - 6	6,000 – 13,000 Year-round	Ground
	Wild Turkey	*Meleagris gallopavo*	1 - 7	3,000 – 8,000 Year-round	Ground
Hummingbirds	Black-chinned Hummingbird	*Archilochus alexandri*	1 – 5 7	5,500 – 7,000 Rare/ Breeding	Trees
Woodpeckers	Lewis' Woodpecker	*Melanerpes lewis*	1 – 7	3,000 – 8,000 Breeding	Cavity
Bushtits	Bushtit	*Psaltiparus minimus*	1 - 7	5,000 – 8,500 Rare	Trees or Shrubs
Thrashers	Sage Thrasher	*Oreoscoptes montanus*	1 - 7	3,000 – 14,000 Rare/ Migration	Shrubs or Ground
Warblers	Wilson's Warbler	*Wilsonia pusilla*	1 - 6	3,000 – 13,500 Breeding	Dense Moist Thickets/ Tangles
Grosbeaks, Buntings, Sparrows	Grasshopper Sparrow	*Ammodramus savannarum*	1 – 4 6 - 7	3,000 – 6,000 Breeding	Ground

*Habitat Types:
1. Urban and Croplands
2. Riparian/ Wetlands
3. Grasslands
4. Shrublands
5. Forestlands
6. Tundra
7. Unvegetated, Exposed-Rock

Table 4.4. Significant bird species of possible occurrence

Group	Common Name	Scientific Name	Habitat Types*	Elevation Range (ft)	Nesting Preference
Kites, Eagles	Bald Eagle	*Haliaeetus leucocephalus*	1 - 6	3,000 – 8,000 Winter	Cliffs and Trees
Hawks	Swainson's Hawk	*Buteo swainsoni*	1 - 7	3,000 – 10,000 Breeding	Trees
	Rough-legged Hawk	*Bueto lagopus*	1 - 6	3,000 – 9,500 Winter	Trees
	Ferruginous Hawk	*Buteo regalis*	1 – 7	3,000 – 9,000 Year-round	Trees
Owls	Burrowing Owl	*Athene cunicularia*	1 – 4, 6, 7	3,000 – 9,000 Summer	Under-ground burrows
Woodpeckers	Three-toed Woodpecker	*Picoides tridactylus dorsalis*	2, 5	8,000 – 11,500 Year-round	Cavity

*Habitat Types: See footnote for Table 4.3.

Conservation of bird species (on-site) will likely depend on restoration efforts to enhance existing habitats.

In addition, threats such as West Nile Virus will require monitoring such that management action may be taken to mitigate negative impacts. Measures will be taken to avoid the use of insecticides as broad-spectrum chemicals may negatively affect the prey base for insectivorous birds.

Figure 4.3. Lewis' woodpecker. (photo courtesy of Cole Wild)

Conservation Target	Birds
Objectives	*Optimize habitat value and protect breeding, migration, summer, winter and year-round ranges.*
Natural Processes/ Functions/ Interaction	Species will prosper through reproductive success and ability to forage, migrate or over-winter.
Threats & Stresses (Source of Stress)	• West Nile Virus. • Human and domestic animal disturbance. • Habitat loss or change (i.e. alfalfa field, burn area, riparian areas, neighboring developments).
Strategy/Action	• Monitor health of species and become familiar with measures to protect or avoid exposure to infection. • Identify sensitive areas and implement seasonal or annual closures to reduce potential disturbance. • Manage to maintain or increase important habitat. • Prohibit dog walking at Bobcat Ridge.
Measure of Success	May be determined by continuing surveys for estimating diversity and densities. Analysis of behavioral response to human activity.
Conservation Plan	• Monitor for presence of mosquito-borne virus or other diseases. • Establish buffer zones and close sensitive areas in need of protection. • Maintain and monitor agricultural field in southeast corner for Grasshopper sparrow habitat. • Manage burned areas to provide standing dead trees for primary and secondary cavity nesters. • Maintain or restore the mountain shrub communities to provide for resident and migratory species. • Manage for increasing nectar sources for resident and migrating hummingbirds. • Maintain or restore the riparian corridor communities to provide for resident and migratory species. • Install wildlife "escape ladders" in water stock tanks.

3. Moths and Butterflies

As part of the biological survey done by Colorado Natural Heritage Program in the summer of 2004, an inventory of moths, butterflies and their habitats was conducted — much of the following section is adapted from this report (Drummond 2004). The Colorado Front Range is the fourth richest butterfly region in the United States (Opler 1994; Opler and Krizek 1984). This is likely due to the variety of environmental conditions at the convergence of the Rocky Mountains and Great Plains, including moist and arid zones, mountain and plains habitats and forest and grassland communities. Table 4.5 summarizes the major butterfly habitat types in Bobcat Ridge Natural Area.

Table 4.5 Major butterfly habitat types at Bobcat Ridge Natural Area

Habitat Types	Notes	Rating (1 = low, 5 = high)
1. Foothills canyons, with water present	Sections of east-draining canyons with steep granite walls, running water, plunge pools; with stonecrop *(Sedum lanceolatum)* for Moss's Elfin and wild hops *(Humulus lupulus)* for Hops Azure. [Note: *Sedum* was present, but *Humulus* was not seen.]	**3**
2. Native short-grass and mixed grass prairies	None seen	**1**
3. Grassy openings in coniferous forests	On upper ridges between east-draining canyons and along the upper North road and upper Power Line Road (leading to Mahoney Park.)	**3**
4. Old fields, pastures, roadsides, power-line cuts	Areas west of the Hanson Feeder Canal in the southern portion, with better examples further north to the west of the historic cabin. These are very disturbed with little native vegetation.	**2**
5. Rocky outcrops, serpentine areas	Extreme NE corner of property, to the ENE of the historic cabin, has good sandstone outcrops culminating in a tiny plateau rich in wildflowers, especially *Asteraceae*, and with some native grasses.	**4**
6. Wet meadows, bogs, fens, marshes and stream sides	Mahoney Park has extensive wet meadows with representative wetland vegetation. Brooks Canyon is very disturbed riparian.	**3**

Bobcat Ridge Natural Area was surveyed for butterflies on April 16, 2004, and on May 21, 2004. A total of 19 species of butterflies were recorded from 11 hours of observation (Table 4.6). This is a very low number of species to be observed for a spring survey in the Colorado foothills. No single species was very common, and fully a third of the recorded species were represented by a single observation.

Table 4.6. Butterfly species observed in April and May 2004 at Bobcat Ridge Natural Area

Common Name	Scientific Name	Habitat Types*	Number observed 4/16	5/21
Anise Swallowtail	*Papilio zelicaon*	6	1	0
Colorado Marble	*Euchloe ausonides coloradensis*	1,6	6	9
Colorado White	*Pontia sisymbrii elivata*	4	3	0
Painted Lady	*Vanessa cardui*	4	0	1
Mourning Cloak	*Nymphalis antiopa*	1,6	11	0
Milbert's Tortoise Shell	*Nymphalis milberti*	1,6	1	0
Hoary Comma	*Polygonia gracilis*	1,6	10	0
Aphrodite Fritillary	*Speyeria Aphrodite*	3,4	0	8
Gorgone Checkerspot	*Chlosyne gorgone*	3	0	12
Field Crescent	*Phyciodes campestris*	4,5	0	3
Silvery Blue	*Glaucopsyche lygdamus*		2	0
Sheridan's Green Hairstreak	*Callophrys sheridanii sheridanii*	1	1	0
Western Pine Elfin	*Callophrys eryphon eryphon*	1	4	0
Moss's Elfin	*Callophrys mossi schryveri*	1	4	0
Melissa Blue	*Lycaeides melissa*	3	0	2
Boisduval's Blue	*Plebejus icariodes*	6	0	1
Persius Duskywing Skipper	*Erynnis persius*	6	0	1
Taxiles Skipper	*Poanes taxiles*	6	0	1
Common Checkered Skipper	*Pyrgus communis*	6	0	1

*Habitat Types: see Table 4.5.

CNHP is currently tracking 15 butterfly species known from Larimer County that occur in low- to mid-elevation habitats, such as those being studied in this year's Larimer County Inventory (Table 4.7). Of these, nine are normally active as adults within the period of mid-April to the end of May over the range of habitats encompassed by Bobcat Ridge. Only one of these tracked species was found; the additional 13 species encountered are neither rare nor sufficiently unique in their habitat requirements to warrant monitoring or tracking.

Table 4.7. Butterflies tracked by CNHP that could be expected to fly in April and May at Bobcat Ridge.

Common Name	Scientific Name	Habitat Type*	= Expected Flight Period			
			APRIL		MAY	
Moss's Elfin	*Callophrys mossi schryveri*	1	■	■	■	
Hops Azure	*Celestrina humulus*	1				■
Sandhill Fritillary	*Boloria selene sabulocollis*	6			■	■
Mottled Dusky Wing Skipper	*Erynnis martialis*	2,3			■	■
Simius Roadside Skipper	*Amblyscirtes simius*	2,3			■	■
Dusted Skipper	*Atrytonopsis hianna*	2,4				■
Cross-line Skipper	*Polites origines*	2,4				■
Rhesus Skipper	*Polites rhesus*	2			■	■
Arrowhead Skipper	*Singa morrisoni*	3,5				■

*Habitat Types: see Table 4.5

However, Moss's elfin *(Callophrys mossii schryveri)*, a globally vulnerable subspecies was documented during the April site visit (Figure 4.4). Moss's elfin flies in April and occurs in foothills canyons with its host plant stonecrop *(Sedum lanceolatum)*. At Bobcat Ridge, the butterfly and its host plant were found in two canyon locations within the Ponderosa Pine Savanna system (Figure 4.5). It is likely that similar canyons nearby may also host the butterfly. A characterization abstract for the butterfly is in Appendix 8.

Poor habitat quality, adverse climatic factors, and/or sampling factors are possible explanations for the low numbers of butterflies observed. Climatic factors are the most likely reason:

Figure 4.4. Moss's elfin. (photo by Paul Opler)

1. Butterfly species throughout Colorado have suffered from the past several years of prolonged drought.

2. A mild spring may have resulted in the early emergence of many butterfly species, advancing the flight season by about two weeks in 2004.

3. Erratic weather patterns due to a mild spring likely increased butterfly mortality whose immature stages are susceptible to viral and bacterial infections during cold rainy periods, and whose adults experience high mortality during hot dry windy conditions. Spring 2004 had both in alternating abundance this year. As a result, butterfly species diversity and population sizes are down throughout Larimer County.

In fact, the variety of habitat types within the Bobcat Ridge boundaries would suggest that butterfly diversity should be fairly high --- as many as 100 to 120 species could be expected in the area. The two-day survey produced less than 20% of this total, although the total fauna would be spread out over a flight season of nearly six months, not all flying at once. The two sample dates chosen should encompass active adult seasons of at least 50% of the butterfly fauna of the area. Thus, the 19 species recorded represent almost a third of the number of species expected to be present.

Butterfly conservation at Bobcat Ridge Natural Area should focus on creating quality habitat suitable for individual species. This may include enhancing or expanding the extent of intact native plant communities and ensure the preponderance of larval host plants and nectar sources. Species characterization abstracts will help identify essential habitat elements or ecological processes that sustain the species.

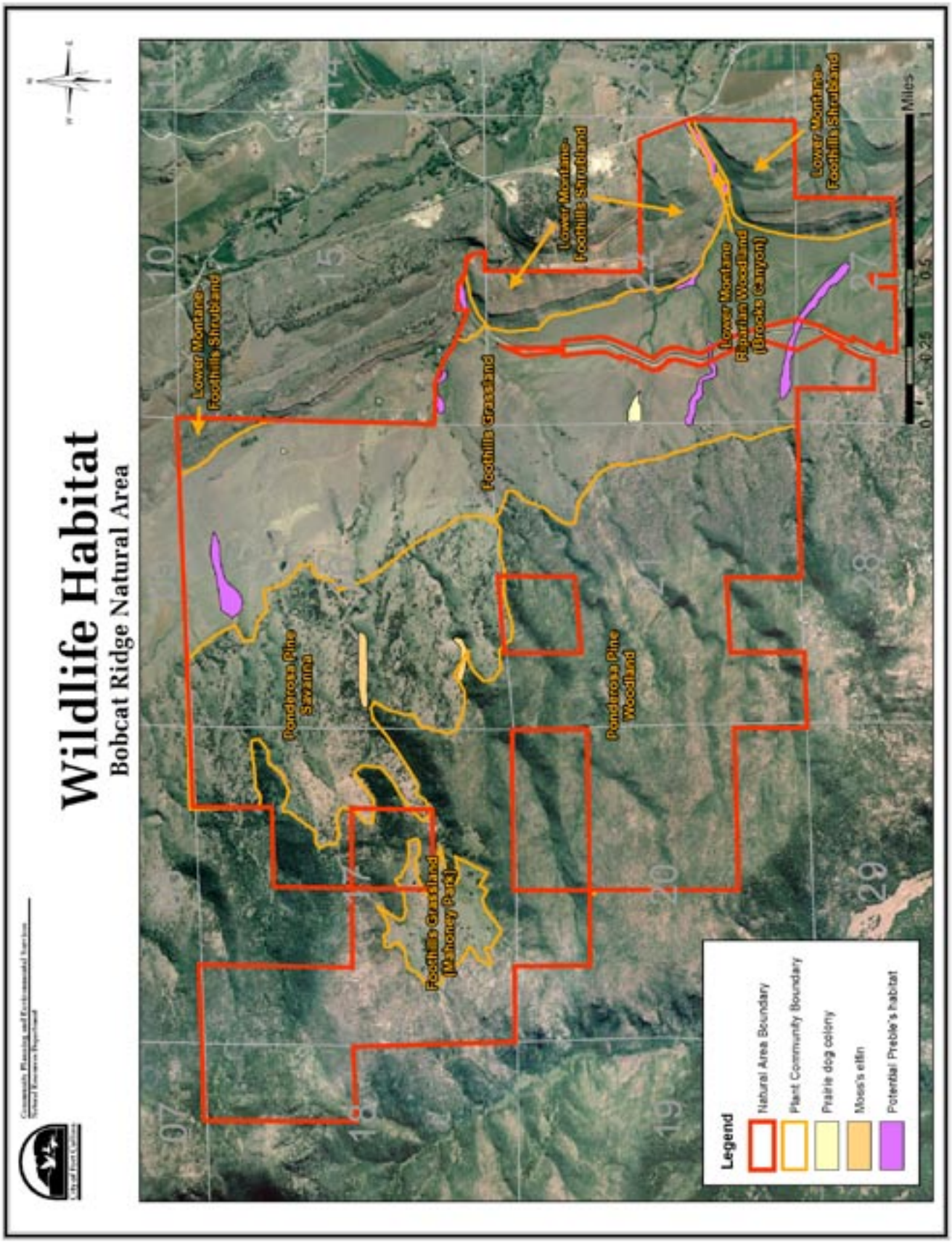

Figure 4.5. Map of Wildlife Habitats.

Conservation Target	Moths & Butterflies
Objectives	*Maintain occurrences of documented rare butterfly species and provide for habitat requirements of those species listed as possible occurrences.*
Natural Processes/ Functions/ Interaction	Presence of the proper microclimate, interactions with larval host plants, nectar sources and other habitat features are all critical to the life cycle of moths and butterflies.
Threats & Stresses (Source of Stress)	• Extended drought and/or erratic weather patterns. • Improper use of insecticides (mosquito control). • Artificial manipulation of hydrology and/or overgrazing in riparian areas. • Replacement of native plants by opportunistic weedy species.
Strategy/Action	• Determine habitat requirements for rare butterfly species. • Restore natural hydrology to all drainages. This may include removal of stock tanks, and implementing soil erosion prevention practices. • Eliminate grazing from riparian areas, and buffer these areas 100 feet back as to provide for adjacent grassland. This may require some form of fencing while grazing lease is active.
Measure of Success	Persistence of Moss's Elfin and re-colonization of Bobcat Ridge by species that are expected to be there.
Conservation Plan	• Maintain and enhance larval host plants and nectar sources. • Investigate the life cycle requirements of the butterfly species tracked by CNHP that could be expected at Bobcat Ridge. • Evaluate whether those habitat requirements are physically represented at Bobcat Ridge. • Continue surveying and monitoring for species and habitat elements. • Restore habitat areas suitable for colonization and migratory stopover.

Chapter References

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Chapter 5
Cultural Resources

Introduction

Bobcat Ridge Natural Area hosts a variety of historical buildings, artifacts, and other cultural resources which are representative of the settlement era in this area of Larimer County (Figure 5.1). Evidence of early Native American use of Bobcat Ridge Natural Area is recorded in the number of artifacts found in and around Bobcat Ridge including the possible tipi ring east of the powerline road. Parts of the property have been a working ranch since the area was first homesteaded in the late 1800's. Numerous buildings associated with the property's homestead and ranching history still exist on the site including the ranchstead with its associated buildings located at the head of Buffum Canyon.

Figure 5.1. Bobcat Ridge.

In early August 2004, Tatanka Historical Associates Inc., a Fort Collins-based historic documentation and preservation consulting firm was contracted to conduct preliminary research and historic analysis of the historic and archaeological history of Bobcat Ridge.

This study collected information regarding the site's general history, additional data on specific, known, historic and archaeological features, and provided general management recommendations. Much of this chapter is adapted from that report dated September 9, 2004.

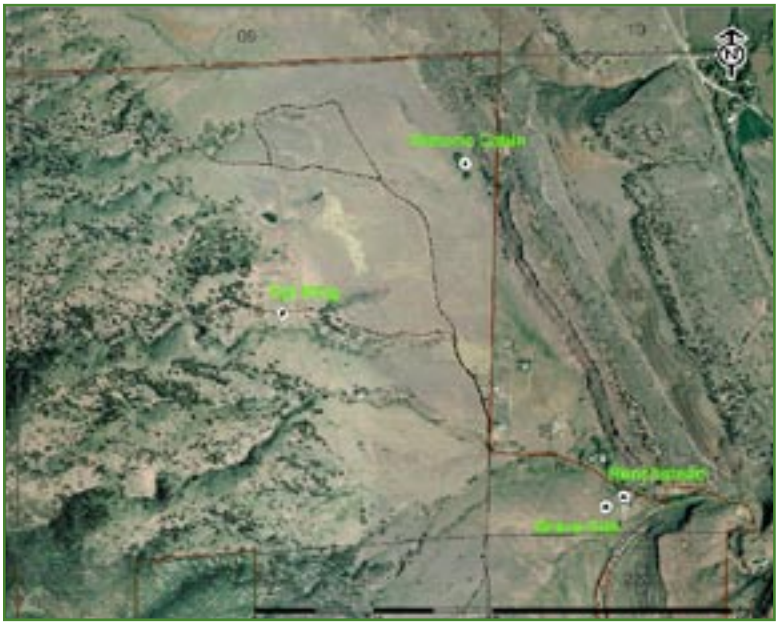


Figure 5.2. Historical and Archaeological Features.

Findings

The historical and archaeological features identified by the City were located and observed. Figure 5.2 shows a map detailing the locations of these features. The following presents their field analysis of these features:

1. Historical Resources

Figure 5.3. Historic cabin.

A. Historic Cabin

This log cabin (Figure 5.2) is located in the northeast quarter of Section 16 and is hidden behind a low hill on the west that obscures it from view. Rising above the cabin to the east is a steep north-south hogback ridge. The building is surrounded by large trees to the northwest, west and southwest that were probably planted over a century ago to serve as a wind and snow break. To the north and south the open ground is covered with a mix of native and pasture grass.

The cabin, which most likely dates from the period between the 1870s and 1890s, rests upon a stone foundation and is constructed of hewn logs with concrete chinking and saddle-notched corners. While the walls are original and the building appears to have been constructed at one time, the roof along with the door and window frames were reconstructed decades ago. All of the windows and doors are missing. Incised into the concrete chinking on the east exterior of the house are the words "Smith Bros." and what appears to be the date "1924." This date may be when the alterations to the cabin took place, and certainly presents an idea of who owned the building at that time and when the logs were last chinked. The hipped roof is finished with wood shingles and tin segmental ridge caps, all features that are consistent with a 1920s replacement date.

Inside the cabin are remnants of some of its original or early finishes and furnishings, all of which clearly date from between the late 1800s and the 1930s. Although the flooring is mostly deteriorated, enough is present to indicate that it was finished with pine. The now-deteriorated ceiling was finished with tongue-in-groove bead boards. In the northwest corner is an old cast-iron kitchen stove that contains the following information: "Hot Closet, No. 20, Pat. Dec. 14, 1886."

Outside of the cabin are several features of historic interest. On the ground to the north a short distance is the rusting body of what appears to be an old Model T Ford. Northwest of the cabin is a water well or cistern that is lined with stone. To the south are an old water pump and a stock tank. The water pump is marked "Dempster Mill Mfg. Co." It is mounted on top of two railroad ties that also contain numerous projecting bolts and large nails that appear to have held down additional equipment. Lying on the ground next to the pump is an approximately 8′ length of riveted metal water pipe. The stock tank is farther to the south and does not appear to be as old as the cabin or pump.

Although the cabin is in deteriorating condition, it is intact enough to be stabilized. At minimum, this will require work on the roof, re-chinking of the log walls, and closure of the now open windows and doors to seal out the weather. The interior flooring and ceiling could also be reconstructed.

B. Other Homesteads/Cabin Remnants

There are at least two other homestead/cabin sites on Bobcat Ridge Natural Area. The cabin once located in the Mahoney Park area (Figure 5.4) burned down at some point; however, the root cellar is still visible (Figure 5.5). There is some discrepancy concerning when this cabin was destroyed. One account has it being destroyed by fire "years ago" (Sladek and Brechtel 2004 pg 18), while another account reported it being burned down in the 2000 Bobcat Fire (Steeves et al. 2004). There is also no consensus as to when the cabin was built or who may have built it.

The second cabin site is located approximately ⅓ to ½ mile up Green Ridge, west of the ranchstead. This site was also reportedly destroyed in the 2000 Bobcat Fire. Further research is necessary to determine the history of these sites and to discover if there are yet more historic cabin sites on the natural area.

Figure 5.4. Mahoney Park cabin location.

Figure 5.5. Root cellar.

C. Ranchstead

The ranchstead (Figure 5.5) is located on the east-central edge of the Bobcat Ridge Natural Area where the county road enters the property (8429 County Rd. 32C). It consists of a collection of historic buildings and developed features, all of them related to the operation of a cattle ranch in the area. Straddling the north and south sides of County Rd. 32C, these buildings and structures appear to date from the 1880s through the 1950s. While the ranchstead evidently started with the late 1880s pioneer house, the chicken house and the barn, its growth and evolution over the following decades into the mid-1900s is part of the story that is told by this complex.

Figure 5.6. Ranchstead.

D. Farm House

The farm house (Figure 5.7) is an L-shaped, 1½-story, wood-framed home that is typical of the 19th-Century pioneer era, probably dating from the late 1880s or 1890s. Resting upon a stone foundation, the building exhibits evidence of modest expansion toward the rear (to the west) many decades ago. Research indicates that this addition took place around 1948.

Figure 5.7. Farm house.

The home is finished with red painted siding dating from recent decades, along with white painted trim and window and door surrounds. Underneath this siding is reportedly an earlier layer of horizontal drop siding, possibly the original. Windows are a combination of original double-hung sashes, circa 1960 double-hung sashes (with springs rather than ropes and weights), and original wood casements.

The steeply-pitched, asphalt-shingled roof consists of two intersecting gables with a central wall dormer on the front. Projecting from the front of the home is a small raised open stoop with a shed roof above, supported by two square posts.

Inside the house, which has been extensively remodeled, are some original materials and a number of modern finishes. Included among the historic features are wood panel doors, original trimwork, and plaster walls hidden behind circa 1960s paneling. The original, or early, layout of rooms is also apparent. In general, however, the interior has a mostly modern appearance with the historic features present but in the background.

The grounds around the house have been landscaped with grass, concrete sidewalks, bushes, and mature trees. Many of these features appear to be quite old. Behind the house is a modern shed.

West and southwest of the house and calving barn is a flat area with a sudden rise along its western perimeter. The top of this rise is reported to contain two infant burials dating from the late 19th century. One archival source checked states that these graves are actually to the west of the south end of the calving barn and are marked by stones.

In general, the historic house and its surroundings have retained much of their late-19th century character. Changes to the residence have occurred, however these did not significantly alter the general layout, appearance and integrity of the building.

E. Railroad Boxcar

The railroad boxcar (Figure 5.8) rests to the south of the house between the residence and the calving barn to the south. This car appears to date from the early 1900s and was reportedly placed on the site to be used for grain storage in the early 1960s. Resting upon concrete and railroad tie piers, the car has wood sidewalls made of vertical planks, metal endwalls, and an arched roof.

Figure 5.8. Railroad boxcar.

Large sliding doors are found on the east and west sides of the car. Projecting from the lower portion of the north endwall is a metal pipe that appears to have been used for on- or off-loading of grain.

Although deteriorating from exposure and lack of maintenance, the boxcar could be rehabilitated. It is an excellent example of the resourceful creation of storage space in a ranch setting.

F. Calving Barn

Figure 5.9. Calving barn.

The calving barn (Figure 5.9), located to the south of the boxcar, was constructed in the mid- to late-1940s. It is finished with board and batten walls and a shed-roof with exposed rafter ends. The east wall at the northeast and southeast corners is open to interior stalls. Hanging from the northeast opening is an old garage door. A swinging board and batten door allows for access to the structure from the north. Small window openings are found along the east wall. In general, this structure is in deteriorating but restorable condition. Without attention, it will eventually be lost due to age, weather, and deferred maintenance.

G. Hayshed

The hayshed (Figure 5.10), located to the east of the calving barn, was constructed in the mid- to late-1940s. It is a large rectangular open structure with a shed roof covered with metal. This allowed easy access to the hay while providing overhead protection from the weather. The structure is generally in good condition, although it may require some attention.

Figure 5.10. Hayshed, pens and corrals.

Pens and Corral constructed in the mid- to late-1940s, which complete this area of the ranchstead. These consist of open dirt areas bordered by heavy wood fences and gates. Stock tanks and troughs are located in this area for the watering and feeding of the animals. A raised wooden chute is also present on the east for the loading and off-loading of stock. All of the items among the pens and corral appear to be in relatively good condition yet will require the normal maintenance expected of ranch features used for the containment of large animals.

H. Chicken House

The chicken house (Figure 5.11) is a small south-facing log building with a rear wall that is partially built into the dirt slope that rises behind the structure. This building reportedly dates from around 1888, when the Hyatt family arrived in the area. It is clearly one of the oldest buildings in the ranchstead complex. The structure consists of hewn squared log walls with dovetail notching at the corners. The front door is made of vertical planks and an unusually large four-space window (with no glass) is located to the right of the entrance. This window was reportedly expanded from the original. The front-gabled roof is finished with wood shingles and a wood plank gable wall.

Figure 5.11. Chicken house.

This significant building is in seriously deteriorated condition, having collapsed a number of years ago toward the rear. The front wall remains upright, however, and the structure's original features are easily distinguishable. Restoration is possible and would allow the chicken house to stand for many decades to come. Without attention in the near future, it is likely to be completely lost.

I. Pioneer Barn

The pioneer barn (Figure 5.12) is located adjacent to the chicken house to the southeast and reportedly dates from the 1888 arrival of the Hyatt family in the area. This structure has no foundation and is constructed of wood posts and beams. It is open to the south and closed with vertical plank walls on the north, east and west.

Figure 5.12. Pioneer barn.

Relatively small for a barn, the side-gabled building has a dirt floor and a full-width front shed-roof projection. The main roof is finished with wood shingles and a tin ridge cap, and the projection is covered with metal. On the east and west elevations are vertical wood plank doors.

This building is in relatively good condition; however it will require ongoing maintenance and some restoration work to keep it standing.

J. Equipment Shed

Figure 5.13. Equipment shed.

The equipment shed (Figure 5.13), located adjacent to the chicken house to the northwest, dates from the early 1950s. This small building is wood-framed and finished on the entire exterior with corrugated metal siding. It has a shed roof with an overhanging full-width metal hood on the south that is supported by poles. The south elevation is largely taken up by two pair of large swinging doors, in front of which is a sloped concrete apron.

K. Poultry Shed

The poultry shed (Figure 5.14), located adjacent to the equipment shed to the northwest, dates from the late 1940s. This long rectangular building, which faces toward the southwest, rests upon a raised sandstone foundation and is constructed of cinder blocks. Wood plank doors are present on the east, west and south elevations, and the front of the building contains numerous screened window spaces with wood surrounds. The poultry shed is finished with a sloped shed roof covered with corrugated metal.

Figure 5.14. Poultry Shed.

Figure 5.15. Grave site.

L. Grave Sites

There are two grave sites marked with rocks known to exist on the property (Figure 5.15). They are located on a low hilltop near the ranchstead southeast of the farm house. The graves belong to two children, but there are differing accounts as to which family they belong and when they were buried. According to one interview (Steeves et al. 2004) they were the Griffith families babies and were buried circa the 1930s. However, another account (Sladek and Brechtel 2004) suggests they were part of the Hyatt family and may have died sometime in the 1890s. Further research is warranted to determine who these children are and when they died.

2. Archeological Resources

Archaeological reconnaissance of Bobcat Ridge Natural Area was limited. It took place about 1½ miles west of Masonville, near the center of Section 16.

The area of this study is a small saddle on a low ridge at the eastern base of a series of foothill slopes which rise westerly towards Green Ridge. This saddle is about 150' north of a small, east-flowing stream. At least one tipi ring was known to the City at this location.

Surface investigation of this area was conducted to ascertain the possible presence of significant archaeological remains such as tipi rings, campfires, and man-made stone alignments or configurations. It was also inspected for artifacts such as arrow points and grinding/milling stones. No ground was broken and only superficial evidence was noted.

Pedestrian transects were used for this investigation. This method is sufficient to detect the presence of any prominent archaeological remains. Approximately two acres around the tipi circle was investigated.

A. Tipi Ring Area:

A single stone circle or tipi ring (Figure 5.16) was observed in this area. The feature is a circular alignment of stones approximately 14 ft. in diameter. It is comprised of a single course of some 75-100 stones, mostly in the range of about 2-5 lbs. each. These stones are mostly granitic and are native to the area. They are well embedded into the soil to an average depth of 5-8 inches.

Stone alignments of this type are most frequently interpreted as tipi rings, presumably used to anchor the edges of hide-covered tipis. However, other interpretations are possible. For example, contemporary Native Americans have suggested that features of this type may also have been made for traditional spiritual/ceremonial uses such as prayer circles.

Figure 5.16. Tipi ring.

Stone circles are a common and widespread prehistoric site type throughout the entire Rocky Mountains/ Central Plains region, undoubtedly numbering in the multi-thousands and likely into the hundreds of thousands. Stone ring sites typically retain very few or no associated artifacts or datable materials, such as charcoal on the surface (although such materials are sometimes recovered through archaeological excavation). Thus, while accurate dating of these sites is generally difficult to impossible based on surface observations alone, excavations at some sites in this region have produced tipi ring dates as old as 4,000 years.

Since the Ute and Arapaho, being the most recent local tribes, were removed from this portion of Colorado to reservations during the 1860s and 1870s, the tipi ring could reasonably be assumed to have a minimum age of 130 years. Considering the embedded depth of the individual stones, it could also be several hundred years old. It is not possible to identify with certainty the specific tribal affiliation of this tipi ring. Records of the Colorado State Historic Preservation Office do contain documentation of at least three additional tipi ring sites, some containing multiple rings, within a 3-mile radius of this feature at Bobcat Ridge Natural Area.

Several other smaller, partially ring-like stone configurations were observed in the vicinity of the complete ring. Small features of this type have been interpreted as the possible remains of conical structures such as sweat lodges. However in this case, these partial rings lack sufficient definition to be positively identified as cultural (i.e. man-made) features. At this time, they can only be identified as possible cultural features.

The ground surface in the area around the tipi ring is generally rocky, and includes some fairly large boulders. A few of these boulders appear to possibly form one or two roughly circular enclosures, although the individual boulders are mostly too large to have been easily moved by hand. These are consequently interpreted as natural, random configurations, although some contemporary Native Americans have suggested that such naturally occurring enclosures were occasionally used as prayer circles. At this time, it appears that with the exception of the single tipi ring described above, none of the stone configurations in the surrounding area can be conclusively interpreted as man-made.

B. Thompson Family Artifact Collection

This small collection consists of four stone projectile points found in the Green Ridge/Buckhorn Valley area by the Dwain and Phyllis Thompson family. Three of these artifacts appear to be arrow points, one of which was collected on Green Ridge itself. The fourth artifact is a somewhat larger stone blade which appears to have possibly been used as a drill or perforator. Among other uses, such perforators may have been used to cut holes in various materials including hides and leather. The basal portion of this artifact has been broken off, thus it may actually have been remade from a formerly larger blade tool of some type. The three arrow points are all small, triangular, corner-notched types, generally within the size range of about ½" x 1".

All four of the artifacts are made of chert and other flint-like stone which occurs in natural outcrops along the Front Range foothills. Arrow points of this type are not uncommon in this area. These appear to be most likely associated with the Late Prehistoric Stage and possibly the subsequent Protohistoric Stage. The Late Prehistoric Stage for Western Native American history is dated between about 150 and 1500 A.D., while the Protohistoric Stage dates from around 1550 to 1850 A.D. It is not possible to associate these artifacts with a specific commonly known tribe in this area, such as the Ute or Arapaho.

3. Management Recommendations for Historical and Archeological Features

Recommended Actions for Historical Resources

- Research who built and occupied the cabins on Green Ridge and in Mahoney Park. Leave cabin remnants as is; possibly interpret the history of these.
- Further research the settlement history and previous ownership of parcels within Bobcat Ridge Natural Area for interpretation purposes.
- Research who is buried in the graves near the ranchstead farmhouse.
- Pursue grant funding for historic structure assessment and stabilize buildings in need of attention.
- Preserve and restore the historic cabin at northeast part of the property. Interpret daily life of that era and possibly specific family history.
- Evaluate for preservation or removal of the boxcar, calving barn, pens, corral and hayshed.
- Leave the chicken house and pioneer barn, equipment and poultry sheds as is for interpretation purposes.

Recommended Actions for Archaeological Resources

- Conduct archaeological reconnaissance in advance of any ground-disturbing projects.
- Consult the Colorado State Historic Preservation Office and the State Archaeologist before publicizing and developing archaeological sites for interpretive purposes.
- Erect permanent fencing around the tipi ring and surrounding area to protect potential archaeological data until more conclusive examination can be completed.
- Develop interpretation materials concerning use by Native Americans if warranted by further investigation.
- As the need arises or as funding becomes available, conduct additional surface reconnaissance especially focusing upon selected areas whose natural topography is known to have high potential for archaeological resources such as rock cliff faces, ledges, overhangs, hogback ridges and their east-facing slopes, as well as ravines, springs, and creeks.

Feature	Location	Action
Isolated cabin	Northeast portion	Restore and interpret
Root cellar	Mahoney Park	Leave as is
Cabin remnants	Green Ridge	Leave as is
Farm house	Main road	Evaluate preservation or removal
Boxcar	Ranchstead	Evaluate preservation or removal
Calving barn	Ranchstead	Evaluate preservation or removal
Hayshed	Ranchstead	Evaluate preservation or removal
Pens and corral	Ranchstead	Evaluate preservation or removal
Chicken house	Ranchstead east of road	Leave as is and interpret
Pioneer barn	Ranchstead east of road	Leave as is and interpret
Equipment shed	Ranchstead east of road	Leave as is
Poultry shed	Ranchstead east of road	Leave as is
Gravesites	Near ranchstead	Preserve
Tipi rings	Lower powerline trail	Preserve
Artifacts	Various	Preserve

Chapter References

Sladek, Ron and James Brechtel 2004. Historical / archaeological planning report, Bobcat Ridge Natural Area, Masonville vicinity, Larimer County, Colorado. Tatanka Historical Associates, Inc. Fort Collins, CO.

Steeves, R., Sue Kenney, and Anastasia Patterson 2004. Personal interview with Dwain and Phyllis Thompson family. April 26, 2004.

Chapter 6
Visitor Use

Goal for Visitor Use at Bobcat Ridge Natural Area: Provide a variety of recreational opportunities for people of all ages and abilities consistent with the Natural Areas Program's mission, carrying capacity of the site, and the program's capacity to deliver a safe, high quality visitor experience.

Bobcat Ridge Natural Area is the first large, regional natural area that has been acquired by the City of Fort Collins Natural Areas Program. It is the Natural Areas Program's goal at Bobcat Ridge Natural Area to provide a high quality visitor and recreation experience while simultaneously protecting the site's significant ecological and cultural resources. This delicate balance will be acheived by matching the types and levels of use to the site's capability to support it.

"…Protection of natural habitats and features is the highest priority, while providing opportunities for education and appropriate recreation for the Fort Collins community."

In the following sections, appropriate recreation uses for Bobcat Ridge are determined through several analyses. The chapter also presents a conceptual design for a trail system as well as methods for visitor management. All recreational uses are evaluated in a context of providing and balancing a high quality visitor experience, the Natural Areas Program's capacity to manage the recreational uses, and the ability to protect the site's resources. Visitor uses and recreation will be monitored and adapted to changing conditions over time as necessary.

1. Determining Recreation Uses

A. Public Input

Staff conducted twelve public tours to Bobcat Ridge in the summer and fall of 2004. While each of the several field trips had different itineraries, the same management issues were discussed and evaluated through a participant feedback questionnaire. This "non-scientific survey" was completed by 130 field tour participants as well as an additional 40 questionnaires completed by attendees to three separate public open houses. The numeric results were as follows (all public comments in Appendix 3):

What types of recreational uses would you like to see here?

The types of recreation uses in order of percentage of times mentioned were: hiking (36%), horseback riding (15%), mountain biking (11%), camping (6%), picnicking (6%) and bird watching (6%). Several other uses were mentioned including tours and nature walks (4%), education (2%) and hunting (<1%).

During the course of a year, how many times are you likely to visit Bobcat Ridge?

Respondents indicated they would visit Bobcat Ridge Natural Area on average five or six times per year.

Are you likely to bring children under age 10?

Only 28% of the respondents indicated they would bring children under the age of 10.

Would you prefer multi-use trails or separate trails for biking, hiking and horseback riding?

More than 71% of the respondents indicated they would prefer separated use trails. Most expressed a desire to separate hikers and bikers. Many respondents preferred some hiking-only areas.

Are there certain biological or historical features you think should be protected?

The most commonly mentioned features included the homestead cabin (21%), tipi rings (18%), bird habitat (8%) streams (5%), and Brooks Canyon (4%).

Is grazing by domesticated cattle an appropriate use at Bobcat Ridge Natural Area when used for vegetation management goals?

More than 70% of the respondents indicated that grazing by domesticated cattle is appropriate when used for the purposes of meeting vegetation management goals.

Is grazing by domesticated cattle an appropriate use at Bobcat Ridge Natural Area to maintain a ranching tradition?

49% responded favorably, while 44% responded negatively. This suggests that there is public support for maintaining a ranching tradition.

What topics would you like to see on education and interpretation signs?

The most requested education topics included plants (22%), birds and other wildlife (21%), geology (13%), historical features (15%), cultural heritage (8%), and fire history (6%).

Should there be designated "wilderness areas" of the natural area that would have no or very limited public access?

More than 65% of respondents were in favor of designated wilderness areas with limited or no public access, while 29% were not. Some respondents suggested having off-trail access for foot traffic only. Conversely, there was some support for on-trail only use, but this was not quantified.

What did you find most interesting on the field trip?

Participants found the general landscape (23%), the birds and wildlife (13%) and tipi rings (10%) to be most interesting on the field trips. The cabin and cultural history, flora, geology, and the burned area were all mentioned but each by less than 10% of the respondents. This feedback suggests that visitors will be interested in guided nature walks, especially to Brooks Canyon, and interpretive information on the ecology, geology and cultural history of the site.

What part of the field trip was the least interesting?

Response to this question was overwhelmingly "not applicable" or no response (65%). People are positive about the area with no real negative issues. Other primary specified responses received were a disinterest in the cattle and ranching operation (12%) and in man-made features such as the fencing and roads (7%).

Is reconstruction or preservation of historic and prehistoric features an appropriate use of natural area funds at Bobcat Ridge?

More than 83% responded favorably to this question while only 12% responded negatively. This suggests that respondents do feel these resources are important to preserve and they would not object to Natural Areas funds being used in the pursuit of this goal at Bobcat Ridge.

B.Regional Analysis of Recreation Opportunities

A survey of regional recreation availability looked at the combined opportunities offered by federal, state, and county parks and open lands, and city natural areas, parks and trails. The purpose was to determine which types of recreation are either widely available or not available or have limited availability on a regional basis. Recreational offerings at Bobcat Ridge could add additional opportunities when the recreation type is consistent with protection of the resources and management objectives for Bobcat Ridge. The summary table is shown below.

Table 6.1 Regional Recreation Destinations and Activities

	Hiking	Dog Walking	Mountain Biking	Horseback	Bird/wildlife Watching	Nature Walk	ADA Compliant Trails	ADA Compliant Facilities	Picnic	Fishing	Rock Climbing	Hunting	Backcountry Camping	Campground
Federal														
Rocky Mountain NP	X			X	X	X	X	X	X	X	X		X	X
Roosevelt NF	X	X	X	X	X			X	X	X	X	X	X	X
State														
Lory State Park	X	X	X	X	X	X	X	X	X			X	X	
Boyd Lake SP	X	X	X		X		X	X	X	X		X		X
County														
Horsetooth Mtn. Park	X	X	X	X	X	X			X		X		X	
Horsetooth Reservoir		X			X	X			X	X	X			X
Devil's Backbone OS	X	X	X	X	X	X		X						
Rimrock Open Space	X		X	X	X									
City of Fort Collins														
Coyote Ridge NA	X		X	X	X	X	X	X	X					
Foothills NAs	X	X	X	X	X	X				X				
City Parks and Trails	X	X	X		X		X	X	X	X				
TOTALS	**10**	**8**	**9**	**8**	**11**	**7**	**5**	**7**	**8**	**6**	**4**	**3**	**4**	**4**

This survey indicates that hiking, dog walking, mountain biking and horseback riding are widely available on a regional basis. Fishing, picnicking, nature walks and Americans with Disabilities Act (ADA) compliant trails and facilities are somewhat available, while rock climbing, backcountry and campground camping, and hunting opportunities are less available.

C. Specific Visitor Use Goals for Bobcat Ridge Natural Area

In summary, visitor uses at Bobcat Ridge include: hiking, walking, running, mountain biking, and horseback riding, wildlife viewing, interpretive walks, an ADA compliant trail, picnicking and backcountry camping on a trial basis. Hunting and rock climbing need further investigation to determine their feasibility at this site. Fishing, campground/car camping, and dog walking are activities not allowed on Bobcat Ridge.

Trails

Goal: Provide a sustainable trail system to a variety of users while maintaining a high quality visitor experience and protecting the natural and cultural resources.

- Employ best management practices and designs that offer scenic vistas, and that are sustainable.
- Design trails to minimize interactions between trail users. Separate pedestrian and horse use from mountain bike use where possible.
- Design trail layout to access scenic vistas at Mahoney Park.
- Develop a trail system that provides opportunities for solitude.
- Develop the trail to include a "Valley Loop" and a property-wide "Mountain Loop".
- Design trails to minimize the opportunity for visitors to create unwanted social trails.
- Create an accessible (American Disabilities Act compliant) trail opportunity with scenic views, interpretive features and an interesting destination.

Picnic Areas

Goal: Create opportunities for picnicking.

- Establish wayside areas along trails for picnics.
- Locate and build picnic shelter(s) to include tables and benches. Prohibit use of barbeques to limit the risk of wildfire.
- Minimize trash-wildlife interactions by highlighting Leave No Trace ethics such as "pack it in, pack it out" and using bear-proof trash cans.

Wildlife Watching

Goal: Provide ample wildlife watching opportunities.

- Manage all plant communities to enhance wildlife habitat and diversity.
- Provide regular guided wildlife watching field trips.
- Provide wildlife viewing destinations as appropriate.
- Provide wildlife viewing information in education products.

Interpretive Walks

Goal: Provide a variety of meaningful educational experiences for all visitors.

- Establish a regular schedule of guided public field trips with a wide variety of themes and

topics.

- Provide self-guided learning experiences through a variety of educational products.

Rock Climbing

Goal: Provide rock climbing opportunities if ecological and safety considerations can be met.

- Determine feasibility of rock climbing areas existing on the property and evaluate management issues related to climbing access.

Hunting

Goal: Manage wildlife to prevent overbrowsing and overgrazing and provide a recreational opportunity that is historic to the area.

- Establish early indicators of overbrowsing and overgrazing to determine when and if hunting would be used as a management tool.
- Determine the feasibility of mixing limited hunting with other recreation and management goals, such as grazing.

Backcountry Camping

Goal: Provide designated backcountry camping opportunities on a trial-basis and as institutional capacity allows.

- Determine feasibility by identifying management issues and potential campsites.
- Determine feasibility of a primitive group campground.

Campground/Car Camping

Not recommended at Bobcat Ridge.

Fishing

Resource does not exist at Bobcat Ridge.

The following tables examine in detail each of these visitor use opportunities, constraints, potentials for a high quality visitor experience, impacts to ecological resources, the Natural Areas Program's capacity to manage the use, and recommended actions.

D. Analysis of Each Recreation Use

Trails - Hiking, Walking, Running

Pedestrian use on natural areas is a staple recreation. Many of natural areas are designated for "on-trail only" use. With more than 2,600 acres, Bobcat Ridge provides an opportunity to increase visitor enjoyment by permitting dispersed recreational use of the site. However, use of designated trails will be strongly encouraged for the purpose of protecting habitat, reducing erosion, limiting disturbance of wildlife and for visitor safety. If an unacceptable level of damage is being caused by the dispersed use, dispersed use will be limited or eliminated and the entire site will become on-trail only. Additionally, certain areas may have limited or no access or be seasonally designated as closed or "on-trail only" as deemed appropriate by Natural Areas Program managers.

Opportunities	Both valley and mountain areas offer ample opportunities for hiking, walking and running. An existing road network is in place that could become part of the trails.
Constraints	Existing roads in the mountain areas are in poor condition and are eroding. These require erosion control if they remain open or restoration if they are closed.
High Quality Visitor Experience	Bobcat Ridge may provide diverse terrain, trail types, and levels of difficulty. Combined with numerous scenic vistas and destination sites, this natural area offers a premier trail experience. Managing visitor behavior through "share the trail" and "trail yield" etiquette, and routine patrol should limit the number of negative interactions.
Ability to Protect Resources	Managed on-trail and off-trail use that avoids sensitive ecological areas can ensure a high level of resource protection. Trail layout must be designed to minimize impacts to target plant communities. The location, amount and timing of trail use must be evaluated to protect nesting raptors and songbirds, calving deer and elk, important wintering areas, moth and butterfly habitat, and other similar conservation targets. Off-trail use must be limited to areas that are not ecologically or culturally sensitive.
Capacity to Manage	Pedestrian use on an established trail system with anticipated level of compliance offers little enforcement challenge to ranger staff.
Recommended Action	• Designate portions of Bobcat Ridge for off-trail foot use. Areas including, but not limited to ecologically sensitive areas, hazardous areas, and working ranch areas will be designated for on-trail only. • Remove dead and standing trees on 30 to 40 feet of either side of trails within burned forested areas to ensure user safety. • Design trail system to avoid the area of the Hansen Feeder Canal for visitor safety. • Design methods to integrate trail system within existing cattle pastures. This may include using cattle guards, spring-loaded pedestrian gates, or separated uses temporally. Interpretive signs could assist.

Trails - Leashed Dog Walking

Dog walking is one of the most popular types of recreational use in city natural areas, especially within the urban area. With limited exceptions, most natural areas and trails are available for leashed dog walking. There are 41 natural areas that allow leashed dog walking out of the 44 open to the public. Out of approximately 33 miles of trail the natural areas program manages, 29 miles are available for leashed dog walking.

Unfortunately, dogs off leash remain the program's number one visitor compliance issue. Conflicts between dogs and other visitors are a continual source of citizen complaints.

Opportunities	Both valley and mountain areas offer ample opportunities for dog walking. An existing road network is in place that could form a basis for portions of the trail layout.
Constraints	There is an active grazing lease on site; potential dog/cattle interactions could occur. Rangers have limited ability to comprehensively enforce on-leash regulations, especially in backcountry areas. Enforcing the leash law has been problematic system-wide. Dogs off leash are a threat to the natural resources being protected and the quality of other visitor's experiences. Wildlife is a threat or a hazard to off leashed dogs.
High Quality Visitor Experience	Natural areas regulations and city code require that dogs be leashed in all natural areas. A limited ability to patrol the entire property would result in low levels of compliance especially in areas out of visual range of the valley. Dogs off leash have caused negative dog/ human interactions in other natural areas.
Ability to Protect Resources	Limited or prohibited dog use of the area would ensure protection of sensitive biological resources (deer, elk, etc.). Dog waste degrades resources and is a human health hazard. It is currently a problem in many other natural areas.
Capacity to Manage	Ranger staff has limited ability to enforce leash code on this property.
Recommended Action	Prohibit dogs at this sensitive natural area.

Trails - Mountain Biking

Mountain biking is one of the more popular recreational activities in the City's natural areas. Currently, the Poudre River Trail, the Foothills Trails, and trails within the natural areas along the foothills are most heavily used. The opening of trails at Bobcat Ridge will offer new terrain and scenery to the mountain biking enthusiast.

Opportunities	Both valley and mountain areas offer ample opportunity.
Constraints	Existing roads in the mountain areas are in poor condition and are eroding. Mountain biking considerably increases erosion. Mountain bikes present more safety issues (speed, lack of control, etc.) than other trail uses. Separating users (i.e. multi-use trail and pedestrian/horse only trail) decreases the potential for user conflicts and increases visitor safety.
High Quality Visitor Experience	Bobcat Ridge may provide diverse terrain, trail types, and levels of difficulty. Combined with numerous scenic vistas and destination sites, this natural area offers a premier mountain biking experience. Managing visitor behavior through "share the trail" and "trail yield" etiquette, routine patrol, and possibly designating a separate-use trail should limit the number of negative interactions.
Ability to Protect Resources	Managed on-trail mountain biking on a planned trail system that avoids sensitive ecological areas can achieve a high level of resource protection. The location, amount and timing of trail use must be evaluated to protect nesting raptors and songbirds, calving deer and elk, important wildlife wintering areas, moth and butterfly habitat, and other similar conservation targets.
Capacity to Manage	Mountain biking on an established trail system with a high level of compliance offers little enforcement challenge to ranger staff. It is anticipated that some illegal, downhill use will occur and require enforcement action. Routine trail maintenance will be required.
Recommended Action	Mountain biking will be designated as an on-trail only activity to increase user safety and prevent resource damage.

Trails - Horseback Riding

Horseback riding is available on many of the City's natural areas although few areas receive heavy use. Bobcat Ridge Natural Area is likely to become a destination for local horse riding enthusiasts. As with most trail systems, horse riders will need to share the trail with pedestrians and mountain bikers unless separate, designated trails can be developed.

Opportunities	Both valley and mountain areas offer ample opportunities.
Constraints	The number of parking spaces available for horse trailer parking will limit the number of horse riders. Access to the site for the local community along county roads is limited.
High Quality Visitor Experience	Bobcat Ridge may provide diverse terrain, trail types, and levels of difficulty. Combined with numerous scenic vistas and destination sites, this natural area offers a premier horseback riding experience. Managing visitor behavior through "share the trail" and "trail yield" etiquette, and routine patrol should limit the number of negative interactions.
Ability to Protect Resources	Managed on-trail use on a planned trail system that avoids sensitive ecological areas can achieve a high level of resource protection. Trail layout must be designed to minimize impacts to target plant communities. The location, amount and timing of trail use must be evaluated to protect nesting raptors and songbirds, calving deer and elk, important wildlife wintering areas, moth and butterfly habitat, and other similar conservation targets. The distribution of weed seed may increase due to horse manure on and along trails.
Capacity to Manage	Use on an established trail system with anticipated level of compliance offers little enforcement challenge to ranger staff.
Recommended Action	Horseback riding will be designated as on or within 10 feet of the trail only in order to prevent resource damage. If pack animals are allowed in backcountry camping sites, campers will be required to use certified weed-free hay.

Trails – Americans with Disabilities Act compliant

The Natural Areas Program is committed to providing a high quality appropriate recreation experience for visitors of varying abilities. System-wide, the Natural Areas Program offers diverse trails of varying surfaces and difficulty.

Opportunities	The valley at Bobcat Ridge provides good opportunity for an all-access trail with scenic views, varied terrain, and interesting destinations.
Constraints	The mountain area has extremely steep slopes; grades would not meet Americans with Disabilities Act requirements. The best location for an all-access trail is between the parking lot and the cabin.
High Quality Visitor Experience	Proper design, with the cabin as an interesting destination, along with ample scenic vistas combine to provide an all-access trail that delivers a high quality visitor experience.
Ability to Protect Resources	Managed on-trail use on a planned all-access trail that avoids sensitive ecological areas can achieve a high level of resource protection. Trail layout must be designed to minimize impacts to target plant communities. The proposed location of an all-access trail has little impact on nesting raptors and songbirds, calving deer and elk, important wildlife wintering areas, moth and butterfly habitat, and other similar conservation targets.
Capacity to Manage	An all-access trail needs to be carefully designed to ensure ADA compliance.
Recommended Action	Build an all-access portion of the trail from the parking lot along part of the valley loop. Trail features could include a picnic area and self-guided interpretive features.

Picnic Areas

Many of the responses and comments that were received as part of public outreach efforts indicated a desire to create picnic opportunities at Bobcat Ridge. Typically the City's Parks department has constructed and maintained picnic shelters. However, as the number of regional natural areas expands and these sites become destinations, it may be feasible to develop picnic shelter near the parking lot and picnic waysides along the trail system.

Opportunities	Opportunities to develop wayside areas along trails for picnicking are abundant. Waysides could consist of a short spur off the main trail to a seating area (fabricated benches, or made of rocks, logs or natural materials), and appropriate signage. There is limited area for a picnic shelter in proximity to the parking area or along the all-access trail.
Constraints	Shelter and table will require routine maintenance.
High Quality Visitor Experience	Wayside areas along trails and a picnic shelter will provide a high quality visitor experience including for visitors who cannot walk into the mountainous areas. Design, capacity, and level of maintenance will strongly influence the visitor experience in the picnic shelter area.
Ability to Protect Resources	Any picnic area will need to be monitored to ensure litter and food scraps do not attract wildlife. Careful consideration must be given to placement of the picnic shelter so that it doesn't impact scenic views. Social trails in and around the picnic areas may occur.
Capacity to Manage	Ranger and maintenance staff would monitor wayside picnic areas and the picnic shelter. Routine cleaning and trash removal would be required at the shelter.
Recommended Action	Plan and build wayside picnic areas in trail design. Include "Leave No Trace" information in education efforts. Use wildlife safe trash receptacles. Determine location of picnic shelter in proximity to the parking lot or along the handicap accessible trail.

Wildlife Watching

Birdwatching and wildlife viewing are a staple recreation activity on City natural areas. Although there is abundant opportunity for this activity in the region, public feedback indicated that Bobcat Ridge Natural Area would be a choice destination for this activity.

Opportunities	Staff and volunteers have documented a large variety of wildlife including deer, elk, wild turkey, mountain lion, black bear, nesting raptors, and over 90 species of birds.
Constraints	The extent of access and level of visitor use is the main constraint. A trail system accessing a variety of habitats throughout the property will permit enhanced viewing opportunities. Heavy visitor use during elk mating season and songbird nesting season could however have the potential to disturb wildlife unless managed through establishing safe viewing locations, limiting times, or imposing seasonal closures.
High Quality Visitor Experience	The size of the property, when considered with adjoining protected land and the variety of ecotones present, provide for a high quality wildlife watching experience.
Ability to Protect Resources	Wildlife viewing and birdwatching are recreation activities at the core of the Natural Areas Program's mission. These activities are anticipated to have minimal impact on biological resources at normal levels of use. Modifying the times and locations wildlife can be viewed will be strong tools to ensure that wildlife and plant communities are not disturbed. Existing Natural Areas regulations protects against disturbing wildlife. Wildlife watching must be restricted to open areas, except on guided interpretive walks.
Capacity to Manage	Wildlife viewing is a generally safe activity. Additional ranger patrols may be required during times of seasonal closures, songbird migration, or elk mating season to ensure resources protection.
Recommended Action	Provide regular guided wildlife watching field trips, including to areas not open to the public. Provide wildlife watching educational products.

Interpretive Walks

Education is a primary focus of the Natural Areas program. The program has an active Master Naturalist Program in addition to staff led interpretive programs. Bobcat Ridge Natural Area abounds with opportunities for both natural and cultural history walks.

Opportunities	The Natural Areas Program has an active education staff and more than 75 volunteer Master Naturalists. The wide diversity of wildlife and plant communities, combined with interesting topography, geology, scenery, and human history of the site provide a variety of themes and topics for interpretive walks and educational activities.
Constraints	The site's topography may limit the ability to accommodate a parking lot suitable for school bus parking, which may limit the number of school programs offered.
High Quality Visitor Experience	The diversity of natural and cultural history features together with a well-designed trail system provides the highest quality visitor experience.
Ability to Protect Resources	Interpretive walks will occur on the same trails available for wildlife viewing. Interpretive walks are anticipated to have minimal impact on biological resources at normal levels of use. Modifying the times and locations that wildlife can be viewed will ensure wildlife and plant communities are not disturbed. Natural Areas regulations protect against disturbing or harassing wildlife.
Capacity to Manage	Education staff has the capacity to plan, advertise and deliver programming at this site. The availability of Master Naturalists may be limited during the spring as program demand is high at this time. However, the desire to lead field trips at Bobcat Ridge is high.
Recommended Action	Conduct regular guided wildlife watching field trips, including to areas closed to the public. Provide self-guided learning experiences through a variety of educational products.

Rock Climbing

For several years, the Natural Areas Program has received a growing number of requests to open portions of some natural areas for the purposes of rock climbing and bouldering. The regional recreation analysis shows that the number of areas open for rock climbing is limited and declining. Although Bobcat Ridge is geologically limited as a climbing resource, the inclusion of this activity in this management plan is intended to evaluate what resources exist and determine the feasibility for the area to support this use.

Opportunities	There are no known rock-climbing sites at Bobcat Ridge.
Constraints	There has not been a complete inventory; however, the geology at Bobcat Ridge is limited for rock climbing. Sandstone deposits along hogbacks in the valley are not suitable for rock climbing. They are also sensitive habitat for raptors, birds, snakes and mammals. At the bases are rare and sensitive plants. The mountain area of the site has some climbable rock outcrops, but ledge faces are limited and degree of difficulty is low.
High Quality Visitor Experience	Sites are not high quality (pitch, hardness of rock, suitable anchors, etc.) and access to potential sites is difficult or lengthy.
Ability to Protect Resources	Hogback areas should be considered off-limits to rock climbing since significant biological resources (nesting raptors and rare plants) have been documented for these areas.
Capacity to Manage	Ranger staff have not been trained or equipped to deal with managing rock climbing areas.
Recommended Action	Prohibit rock climbing on hogback ridges to protect sensitive ecological resources. Conduct an inventory in mountain area for potential climbing areas. If prospective locations exist, provide opportunities based on ecological and safety considerations.

Hunting

Any hunting that is considered for Bobcat Ridge needs to contribute to and be compatible with the ecological and recreation objectives for the property.

Opportunities	Game species such as deer, elk, and wild turkey inhabit Bobcat Ridge. Bobcat Ridge is adjacent to Roosevelt National Forest which permits hunting. The Colorado Division of Wildlife has recommended hunting here to avoid overbrowsing, overgrazing and unnatural concentrations of wildlife.
Constraints	Natural Areas regulations prohibit hunting. The likelihood of hunters trespassing onto Bobcat Ridge from adjacent US Forest Service property is high and has been documented during the 2004 season. Rangers are not armed and would be at a disadvantage in an enforcement situation. Hunting on neighboring property may require temporary closures of Bobcat Ridge trails to ensure visitor safety.
High Quality Visitor Experience	Game species are common at Bobcat Ridge. There has been active hunting on the property in the past by neighbors and a professional outfitter.
Ability to Protect Resources	Hunting as a sport is generally a low impact activity with the exception of hunting camps. However, hunting does destroy native wildlife that the Natural Areas Program seeks to protect. Hunting can be used as a tool to manage herd numbers when overuse occurs or diseased animals are found.
Capacity to Manage	Rangers are unarmed. Enforcement activities or field situations would pose a threat to officer safety and place the rangers at a serious disadvantage. The Natural Areas Program has not previously managed hunting on any of its natural areas.
Recommended Action	Analyze and consider possibilities for recreational hunting in the future. Hunting at this site may be an appropriate recreation and/or ecosystem management tool. Any consideration of hunting will strongly emphasize wildlife and vegetation management, visitor safety, the safety of the city's rangers, and the city's ability to enforce hunting regulations.

Backcountry Camping

Public feedback indicates a desire for backcountry camping. Opportunities for backcountry camping are regionally limited to federal lands and Lory State Park.

Opportunities	Bobcat Ridge Natural Area is well suited for designated backcountry camping. The mountain area of the site has a variety of suitable areas.
Constraints	Infrastructure, regulations and a permit system needs to be developed. Human waste is a major issue. Attracting wildlife such as bears could become an issue.
High Quality Visitor Experience	Bobcat Ridge offers opportunities for overnight getaways close to urban areas.
Ability to Protect Resources	Designated camping sites need to be in areas that do not impact protected resources. Open fires would not be permitted. For visitor safety reasons, campsite should be closed during fire bans and during hunting season due to the close proximity of the national forest where hunting is permitted. Camping sites require close monitoring to ensure that regulations are adhered to and so that garbage does not accumulate and attract wildlife.
Capacity to Manage	The Natural Areas Program has not permitted or managed this use previously. A permit system needs to be administered. Designated camping sites need to include tent platforms and a plan for dealing with human waste. Natural sources of water for use by campers are limited in the mountain area and would require purification.
Recommended Action	Complete a feasibility plan to address management issues and identify potential campsites.

Campground/Car Camping

This recreation activity was limited on a regional basis to local federal lands and county parks such as Horsetooth Mountain Park.

Opportunities	Limited to valley area of Bobcat Ridge.
Constraints	Even a small campground would dominate the valley of Bobcat Ridge. Most valley locations would conflict with existing cattle grazing leases and adjacent neighbors. Substantial road construction would be required. Campground camping would require expand working hours and for staff to be routinely on call.
High Quality Visitor Experience	Interior locations would be best for a high quality visitor experience, but requires roads which severely impact ecological resources. Locations in the periphery of the property would impact neighboring properties.
Ability to Protect Resources	Impact of the footprint of the campground, roads, necessary water sources and restrooms would impact terrain, wildlife, and visual resources.
Capacity to Manage	Daily maintenance would be required. At this time ranger staff is not permitted by policy to work after dark.
Recommended Action	Eliminate this recreation activity from consideration as a potential use at Bobcat Ridge.

2. Trail System

It is the intent of the Natural Areas Program to provide a high quality visitor experience while protecting the natural and cultural resources. Currently, Bobcat Ridge Natural Area has several two-track roads in use for the ranching and previous logging operations. Portions of these may serve as trails. Portions that are not suitable as trails will be closed and restored. It is suggested that for every mile of new trail, one mile of existing roads not planned for use be restored, so there is no net gain (i.e. no gain in site disturbance).

Citizens indicated they would like a trail system with wayside picnic areas with scenic views of the undeveloped valley, hogback cliffs and the mountains. They also said that trails through different ecotones and a diversity of habitats would be popular. Participants enjoyed visits to the tipi rings and cabin, and expressed a desire that these be destinations in the trail system. Finally, there was strong support for separate-use trails (hiking and biking on different trails).

The recommended trail layout is shown in Figure 6.1. There is no public trail access east of the Hansen Feeder Canal. The canal poses an extreme public safety concern. The trail layout is designed to avoid views or access to the canal so that visitors are not tempted to venture off trail to investigate the area. Brooks Canyon and the hogback cliffs are sensitive habitats and are closed to general public use. Guided nature walks to Brooks Canyon during the appropriate seasons will be allowed.

Trails that cross drainages will be designed to minimize impacts to the habitat (i.e. limiting stream flow, or creating erosion). A spur trail will lead visitors to the historic cabin and will provide scenic views of the hogback cliffs; however it will also respect the buffer distances needed for the nesting raptors.

Three separate phases of construction providing continued expansion are recommended and outlined below. Throughout all phases of construction, a primary consideration will be the utilization of current trail building techniques that will reflect the different trail uses intended for sections, (i.e., ADA, pedestrian, mountain biking, and equestrian).The appropriate trail layout and use of measures such as grade dips, switchbacks, and tread armoring will be utilized to minimize the disturbance created and alleviate erosion problems to the greatest extent possible. Due to the high level of use expected by the various user groups, it is anticipated that the level of tread compaction and displacement from public use will be elevated, and the associated maintenance costs will rise proportionately.

Phase I – Valley Loop *(construct prior to opening)*

Phase I trails (delineated in red) are multi-use trails through the valley avoiding the canal area. These trails will give the public an introduction to the site, including access to cultural and natural features. Hiking, horseback riding and mountain biking will be accommodated on Phase 1 trails. A self-guided nature walk will be installed along this segment. Natural Areas Program staff will work with ranchers to locate trails in existing cattle pastures. Installation of cattle guards, spring-loaded pedestrian gates and other features to mitigate conflicts with grazing operations will also take place during this phase.

Phase II – Mahoney Park and Green Ridge Segment *(construct within 1–3 years)*

Phase II trail segment (shown in blue) will provide multi-use access to Mahoney Park and the high point on Green Ridge.

Phase III – Mountain Loop *(construct within 3 – 5 years)*

Phase III trail segment (shown in green) will complete the Mountain Loop. The northern part of the Mountain Loop will be designated as a hiking and equestrian trial (no mountain biking); the southern part will be a multi-use trail. Both segments will connect in Mahoney Park.

Eden Valley Access

A possible second access trail is shown in yellow. This multi-use trail would provide access to the neighborhood south of Bobcat Ridge. This would be walk-in only (no parking lot) and may be constructed during one of the phases mentioned above.

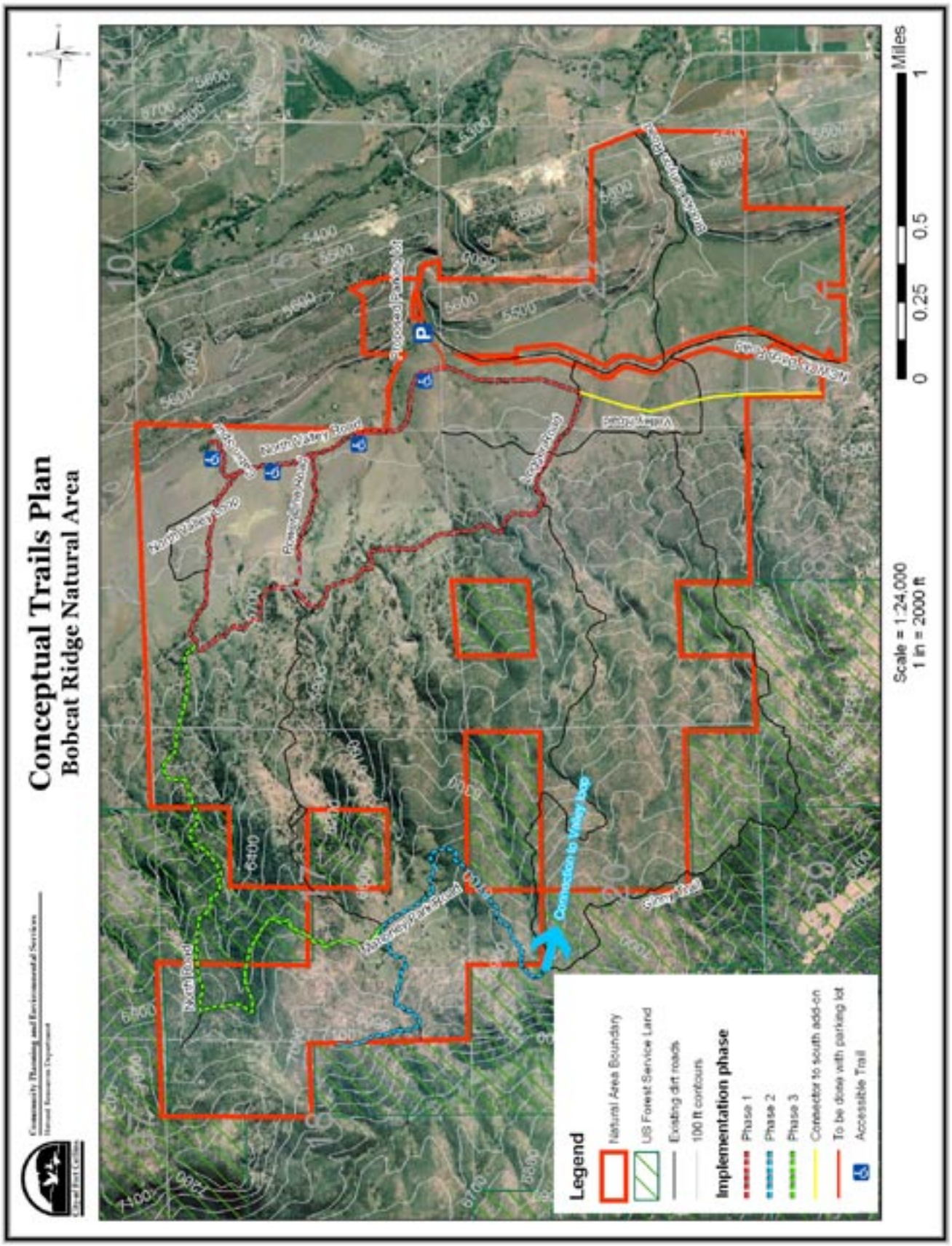


Figure 6.1. Proposed trail location map

3. Managing Visitor Use

Seasonal closures and limited recreation areas may be necessary for reducing the impact of recreation on certain wildlife species. The Natural Areas Program will monitor the amount and locations of visitor use, timing issues, visitor behavior, types of uses and visitor expectations.

The trail system and designated visitor use areas are located to ensure the safe use and high quality visitor experience while ensuring sustainability of the resources. Some trails may cross or come near areas identified as sensitive or potentially sensitive. Best management practices will be used to ensure the sustainability of long-term recreational use without damage to the resources. For instance, some trails may have seasonal closures and some trails will be designated for certain uses only such as foot traffic.

A. Law Enforcement

Law enforcement actions adhere to guidelines and objectives established in the Natural Areas and Trails Ranger Manual. Natural Areas and Trails Ranger personnel will provide primary law enforcement responsibilities. Rangers' primary responsibilities at Bobcat Ridge will include patrolling, educating the public about rules, regulations and resource management, issuing warnings and/or citations, monitoring site conditions for misuse and maintenance needs and calling for assistance in situations requiring emergency response.

Rangers have a limited commission to enforce Natural Areas regulations and City of Fort Collins code. Rangers are unarmed and are not equipped to deal with certain situations. In situations involving criminal activities, rangers will call for appropriate back up. Colorado Division of Wildlife will handle situations involving illegal hunting. All other criminal activities will be handled by Larimer County Sheriffs Office.

The on-site ranger will be responsible for the primary patrol and enforcement responsibilities at Bobcat Ridge. All other Natural Areas and Trails Ranger personnel will provide a secondary role in enforcement activities. Ranger trucks and all-terrain-vehicles will not be used for routine patrol of the site, but may be used only for maintenance and in emergency situation (see below).

A horse mounted patrol program based at Bobcat Ridge Natural Area is currently under consideration and may be implemented in the future. The mounted patrol program would include a facility and horses to be maintained by the on-site ranger. The intent of the mounted patrol is to provide an effective means to patrol the area while providing a soft, approachable image to the public appropriate to the site.

B. Emergency Response Plan

Bobcat Ridge Natural Area is the first natural area in the City of Fort Collins system that has extensive backcountry. This, combined with the property's relatively large size and remote location, warrant an emergency response plan to ensure visitor safety and site protection.

Emergency response may involve several agencies and fire protection districts. For all emergencies, 911 will be the primary contact number. Emergency dispatch will send the appropriate response, as determined by the nature of the emergency. Callers should provide the physical address for Bobcat Ridge Natural Area as 8281 West County Road 32C. The main entrance gate is one mile west of County Road 27. A list of responding agencies is provided below:

AMBULANCE / FIRE / POLICE

Any Emergency 911

Larimer County Sheriffs Office (LCSO) 970-416-1985

Fort Collins Police Services 970-221-6545

Larimer County Emergency Services (LCES) 970-498-5301

Natural Areas and Trails Rangers 970-416-2147

Thompson Valley EMS 970-669-1235

FIRE

Any Fire 911

Loveland Fire Department 970-962-2537

Poudre Fire Authority (PFA) (station 9) 970-221-6570

WILDLIFE and NATURAL RESOURCES

Colorado Division of Wildlife 970-461-4003

Aimee Ryel (law enforcement)

Fort Collins Natural Areas Program 970-416-2815

Larimer County Parks and Open Space 970-679-4570

United States Forest Service 970-498-1360

Lenora Arevalos (law enforcement)

HAZARDOUS MATERIALS

Emergency 911

Larimer County Health Department 970-498-6775

Rich Grossman

City of Fort Collins Natural Resource Dept 970-224-6179

Margit Hentschel

HOSPITALS

Mckee Medical Center (Loveland) 970-669-4640

Poudre Valley Hospital (Ft. Collins) 970-495-7000

a. Vehicle Access

There are two vehicle entrances into Bobcat Ridge. The north entrance address is 8281 West County Road 32C. The south entrance can be accessed by driving west onto CR 29 from CR 27. CR 29 runs through Eden Valley Ranch and ends at the canal road and gate.

Bobcat Ridge is able to accommodate air and vehicle evacuations should medical emergencies arise. Responding agencies may include LCSO, LCES, Loveland Fire, PFA, Thompson Valley EMS and Natural Areas Rangers. Medical supplies and equipment will be cached in a storage area located near the entrance or parking lot. The storage area will be available to Natural Areas employees and emergency crews.

The power line service road that provides accesses to Mahoney Park will serve as the primary vehicular access road leading to the westernmost ridgeline. The emergency accesses will be marked appropriately to guide emergency response crews.

b. Wildfire

Wildfire operations falls under the jurisdiction of the Loveland Rural Fire District (LRFD). All wildfires at Bobcat Ridge will be suppressed. A memorandum of understanding is being developed with Loveland Rural Fire District which states that they shall provide initial attack and response. Natural Areas Fire Crew and Poudre Fire Authority may provide assistance as requested and directed by LRFD. Future fire management at Bobcat Ridge is being addressed as part of the comprehensive restoration plan (prescribed fire).

c. Air Support (Flight for Life and Helitack)

Bobcat Ridge will have emergency accesses from the air that will be suited for air operations related to medical evacuations (Flight for Life) and wildland fire operations (Helitack). All valley portions of Bobcat Ridge are currently accessible by air transport and two landing zones will be located close to the top of the westernmost ridge in the areas near Mahoney Park and in the upper reaches of what is currently referred to as the Ginny Trail.

Landing zone (helibase) pads will require periodic maintenance to clear debris, downed trees and anything material, natural or unnatural that could become airborne and hit the helicopter's rotors. Natural Areas Ranger staff will be responsible to ensure this condition is maintained. No ground disturbance will be necessary as native ground cover seals loose dirt and prevents formation of dust clouds during take off and landing. The helibase will require 100 feet diameter clearance for the rotors. Existing areas currently meet these specifications.

Chapter 7
Education and Outreach

1. Introduction

Educational and outreach opportunities are many and varied at Bobcat Ridge Natural Area. The variation in terrain, diversity in habitat, open vistas, unique geology and bountiful cultural history provides endless subject matter for presentations by volunteer and staff naturalists as well as permanent interpretive displays and features.

The mission of the City of Fort Collins Natural Areas Education Program is to increase the public's awareness of natural areas; promote understanding of natural systems, and foster each individual's realization of the importance and meaning natural places add to our lives. The education program accomplishes this by providing diverse materials on a variety of topics concerning natural areas; by actively providing experiential and participatory learning situations; and by personal outreach by trained volunteer naturalists.

The education program integrates education with appropriate recreation in natural areas to further promote awareness. Bird watching, plant identification, reflecting, looking at scenery, attending a guided nature walk, hiking, horseback riding and biking allows all citizens to explore and discover natural areas in a relaxed setting. At Bobcat Ridge, field tour surveys (summer 2004) asked visitors "What topics would you like to see on education and interpretation signs?" The most requested education topics at Bobcat Ridge included plants (22%), birds and wildlife (21%), geology (13%), historical features (15%), cultural heritage (8%), and fire history (6%). Thus, both presentations and interpretive materials will feature these themes.

The Natural Areas Program takes an interpretive approach to all educational products and activities including presentations, brochures, signage, and displays. This means taking technical concepts and language of the natural and cultural sciences and making it meaningful to non-scientists - even those who may not necessarily be very interested. It is our goal to arouse people's interest, make this information as accurate as possible and relevant to our audiences, to encourage participation, and reveal meanings and relationships in our natural and cultural heritages.

Interpretive features, print material and personal communication by interpreters via guided field trip and presentations, will help citizens understand the complexity Bobcat's ecology, the long cultural history of the area, and some of the challenging management issues. The management issues to be addressed may include on-going ranching activities, management of grazing by domestic and wild animals, hunting, and prescribed burning.

A strong emphasis in the education and outreach efforts will be placed on "Leave No Trace" ethics that help inform visitors about the impacts of their actions on the land, on wildlife, and on other users. These will help the visitor learn to recreate on the land in a sustainable low-impact fashion.

Overall Theme

"Bobcat Ridge Natural Area is a land of surprising diversity in its landscapes, history, plants and wildlife."

2. Objectives

Through interpretive panels, brochures, waysides, and other educational features, programs, presentations and personal contacts with education personnel, visitors to Bobcat Ridge Natural Area should:

- Recognize that this area is managed to conserve the natural resources and provide appropriate recreation opportunities.
- Be oriented on the site and easily recognize designated trails and closed areas.
- Know and follow the regulations for use, and understand the reasons for these (including why dogs are not allowed).
- Understand the potential risks of visiting this natural area (e.g. rattlesnakes, steep rocky trails, exposure to weather extremes).
- Be aware of the some of the management issues at the site.
- Have an increased awareness of the rarity, vulnerability, and diversity of prairies and foothills in general.
- Feel a sense of responsibility and stewardship toward Bobcat Ridge Natural Area in particular.
- Feel a sense of wonder and fascination from having the seen the landscape in a new way.
- Willingly conduct themselves so that the resource is not damaged.
- Seek out other learning opportunities about nature.
- Have an understanding of previous and ongoing research projects at this site.
- Learn about the ecology of the mountain shrub and ponderosa pine communities of these foothills and their associated riparian areas.
- Explore different habitat types and realize their significance.
- Identify some of the common plants of the mountain shrub community.
- Learn some of the common and rare animals of this area.
- Anticipate seasonal changes in the wildlife community.
- Appreciate the role fire has in the ponderosa pine forest.
- Discover some of the geology of the area.
- Learn about the history of this site.
- Understand the role of grazing in vegetation management.
- Understand the ethics of "Leave No Trace" and demonstrate appropriate behavior.

3. Proposed Education Products

Interpretive panels and features

These will be designed and placed to fit into the landscape, yet allow the visitor to fully learn and appreciate the amenities of Bobcat Ridge. Interpretive features will be designed to be unobtrusive. This objective will be balanced with the goal of providing visitors with a clear orientation to the site and the regulations for use.

The interpretive features will be presented in dynamic, accurate, and engaging ways, and will balance the aesthetics of the site while providing fun interpretive experiences for the visitors. The interpretive features will be designed to engage a wide range of visitor ages and abilities, and enable visitors to use many different senses and preferential learning styles. Interpretive features will be interactive where possible. Exhibits will be inviting, drawing in visitors with dynamic illustrations, easy-to-read active voice text, and three dimensions as appropriate, and will allow visitors to learn through exploration.

Self-guided interpretive walk with brochure

This may involve numbered posts or other unobtrusive structures that allow the visitor to learn more in-depth material about Bobcat Ridge. This type of brochure is be updated and changed over time, to provide repeat visitors new material.

Kiosk with orientation panel, bulletin board and brochure racks - This structure will be located at the trailhead parking lot in a manner that requires all visitors to pass by it and have the opportunity to read the information, become oriented to the site, and learn more about the Natural Areas Program. The kiosk will house an interpretive panel that welcomes and orients visitors to the site and informs them of the regulations. The kiosk will also house a bulletin board for staff to inform visitors of upcoming programs and events, wildlife sightings, additional safety information, or other topical subjects. The brochure holders will have information concerning the Natural Areas Program, pertinent topics to this site and general information of interest to the visitors.

Site-specific brochure

This will incorporate a trail map, distances, elevation gain and major landscape features. This will be designed so the visitor can carry it with them and refer to it while visiting the site.

Animals species lists

These will be developed over a period of several years as more surveys are completed, but will initially include birds and mammals. Eventually butterfly, amphibian and reptile lists will be developed. These lists enable some visitors to more fully explore the diversity of wildlife at Bobcat Ridge and more fully appreciate the dwindling habitat of this type along the Front Range.

Plant species lists

This will also be developed over a period of several years as more surveys are completed. Proposed categories will be trees, shrubs, grasses, vines and forbs (herbaceous flowering plants). Plant lists help the visitor learn what to expect at the site and to appreciate the large diversity of plants and their habitats at Bobcat Ridge.

4. Suggested Education and Interpretive Topics

Ecology of the Red Sandstone Cliffs

The red sandstone cliffs are a major feature of Bobcat Ridge and their spectacular beauty is highly visible from many vantage points at Bobcat Ridge. Although not all the cliff sides are a part of the natural area owned by the City of Fort Collins, they should be a major topic of interpretation because of their visibility. The geology of their formation as well as the plants and animals that inhabit them are of interest. Animals that use the cliffs include a variety of raptors, turkey vultures, ravens and crows, white-throated swifts, cliff swallows, rock pigeons, rock wrens, canyon wrens, rattlesnakes and rock squirrels.

Ecology of the Mountain Shrub Community

This plant community, along with its associated drainages, is important in Colorado's landscape. The dominat plants include mountain mahogany, three-leaf sumac, winter fat, American plum, chokecherry, and several currants. The importance of this habitat type will be one focus of the education efforts.

Ecology of the Ponderosa Pine Community

Most of the site is dominated by this plant community. Adaptations of the ponderosa pine to dry conditions and fire, regeneration and plant succession following a fire, the fire regime and wildlife associated with mature forest and post-burn forests are topics to interpret. Helping visitors understand forest fire ecology along the Front Range and why a prescribed fire may be a good management tool in an already burned forest may also be a main topic.

Cultural History

Staff will explore the possibilities and extent of interpreting the cultural use of the site. There are several remnants of cabins at Bobcat Ridge (see chapter 5 for a more complete description) and possibly tipi rings. There is opportunity for living history programs.

The rings of stones may denote Native American use of this site. The lifestyle of the particular tribe, as well as the dates and seasonal use by Native Americans are of interest. Other related topics may be how tipis are constructed and used, life inside a tipi and other social dimensions. The Colorado State historic Preservation Office and State Archeologist will be consulted prior to publicizing and developing interpretive features for the archaeological sites.

Descriptions of the use of the cabins by hunters, trappers and homesteaders could be of interest. The isolated cabin will be a major destination spot with an accessible trail to this point. Details and anecdotes of daily life of that era, as well as specific family history will be explored and presented via signage and personal communication.

Because ranching activities will continue for the near future at Bobcat Ridge, explanations about this (including grazing rotations, haying operations, equipment and machinery, fencing, etc) may need to be explained to the public. This could be handled via flyers, fact sheets and personal communication by Master Naturalists and Natural Areas Program staff.

Chapter 8
Site Administration

Bobcat Ridge is the first "regional", and largest property to date that will be managed and operated by the City of Fort Collins Natural Area Program. Staff immediately began assessing initial needs of the site following the acquisition of the property in December 2003. This including posting the area as closed, managing the boundaries, and completing an inventory of existing roads, structures, and other features of importance. The intent in this chapter is to layout other property management considerations related to infrastructure, access, administration, roles, and restrictions of easements and leases, and costs for planned public improvements.

1. Existing Easements and Leases and Issues

Lease of the Farmhouse

At the time of acquisition, the farmhouse at the entrance of Bobcat Ridge (8429 West County Road 32C) was rented to an individual, though there was no formal rental lease between the Pulliam Trust and the tenant. After the City purchased Bobcat Ridge, a rental lease agreement was signed with the occupant for a period of twenty-four (24) months commencing on December 17, 2003 and terminating at midnight on December 16, 2005. It is the intention of the Natural Areas Program to allow the lease to expire, remodel the interior, and station an on-site ranger to occupy the quarters and be responsible for the overall operation of Bobcat Ridge.

Lease for Cattle grazing

The formal grazing lease between the Pulliam Trust and the Meining Cattle Company LLC was (upon the City's acquisition) transferred to the City and extended from December 17, 2003 and terminating on December 16, 2005. The Lease states, a rental rate of $12.00 per cow/calf pair per month (AUM) for the grazing seasons, June through October. Cattle are permitted to remain on site between grazing seasons but are fenced and hay-fed during that time. The Meining Cattle Company is also permitted to grow and cut hay and other crops and to pasture and graze up to 150 cow/calf pairs, and up to six horses at any one time. During the time of the lease, the Cattle Company is also responsible for weed control in the valley portions of Bobcat Ridge and all aspects of irrigation related to crops.

Power Line Road & REA Road Easement

Rural Electric Authority has an easement to check the power lines that run from east to west through Bobcat Ridge Natural Area. They gain access through a lock they keep on the gate at the end of 32C to check a breaker box near the large stock pond between the Powerline Road and the North Road on a monthly basis. Once every four years REA uses the Powerline road to limb trees for the purposes of protecting the lines. Al Hinojosa at REA may be contacted at (970) 226-1234, ext. 403.

Hansen Feeder Canal

The Northern Colorado Water Conservancy District (NCWCD) operates the Hansen Feeder Canal (Figure 8.1) which supplies water to private ranches and transfers water from Carter Lake to Horsetooth Reservoir in Larimer County. NCWCD uses the canal road (that runs parallel to the canal) on a regular basis for maintenance on the canal. At this time only NCWCD the City of Fort Collins, and the Meining Cattle Company have legal access to use the canal road.

Figure 8.1. Charles Hansen Feeder Canal

In an initial scoping meeting held on December 2, 2003, NCWCD expressed concern related to any public development or access to or near the canal as it poses a safety hazard. In the past, neighbors used the road based on an informal agreement with the Pulliam family. Based on safety and liability concerns, the Natural Areas Program will strictly limit access and monitor use of the canal road to legal users. The canal road will be closed to public use. However, arrangements will be made to utilize the canal roads for the purposes of emergency access in the event of flooding of CR 32C, wildfire, or other natural emergency.

The NCWCD uses the canal road on a regular basis for maintenance on the canal. The two field technicians who service this area at this time are Roger Sinden (622-2223) and Dennis Miller (622-2500).

County Road 32C

This road historically has washed out once or twice every five years at the mouth of Buffam Canyon where CR 32C intersects CR 27. Neighbors indicate there are about five other areas along the road that also wash out. One (non-functioning) culvert near the Norman residence causes their basement to flood on a more frequent basis. Repair or replacement of this culvert could alleviate some of these issues, but primarily would be the responsibility of Larimer County. When this road does flood, neighbors, the on-site manager and visitors to Bobcat Ridge may be prevented from using this access. In the past, residents have used the canal road and exited via the Eden Valley road.

An emergency protocol is required to address this issue in the event the road is not passable and should be made clear to neighbors and natural area visitors alike. The protocol suggested is for stranded residents or visitors to notify the county sheriff, city ranger staff, Bobcat Ridge Site ranger, or the NCWCD to open the gate at the canal road and permit residents to exit via the south entrance (Eden Valley road) until the road is repaired.

Local residents expressed concern with the public venturing down some of the private drives and roads along CR 32C. The Natural Areas Program could alleviate much of this concern by providing standardized signing indicating the driveways are private with no public access. Another approach will be to sign CR 32C as “local traffic only” or “Dead end”. The Bobcat Ridge site ranger should remain in contact with neighbors to monitor the situation and adapt as necessary.

Shooting Range

A private shooting range is located on private lands bordering the southeast boundary and is oriented toward the natural area. The range sits in a ravine and all targets are below the ridge top. Participants shoot the third Sunday of every month and they use black powder rifles. The range (shot distance) of a black powder rifle is approximately 150 to 200 yards. The area of Bobcat Ridge adjacent to this site is planned to be closed to public access as this area includes all lands east of the Hansen Canal, including Brooks Canyon which will be closed to public access other than occasional tours.

US Forest Service

USFS is an adjacent property owner and has three parcels (totaling 160 acres) of inholdings on Bobcat Ridge. The following issues were discussed with USFS and are summarized below:

USFS In-holding properties:

The USFS currently owns 160 acres on three separate parcels within Bobcat Ridge's boundary. These parcels and the adjacent lands are managed as part of the Cedar Park Geographic Area and managed as forest flora and fauna habitats and scenery. This management direction is consistent with the Natural Areas Program's management for natural areas values. The Forest Service is willing to work with the City of Fort Collins in a land exchange to consolidate ownerships.

Fire Management:

The Forest Service is interested in developing a joint fire management plan for the area to limit the potential for catastrophic wildfire. While much of the Bobcat Ridge's forest burned during the Bobcat Fire (~70%), there is still some potential for wildfire in existing forests and in areas heavily invaded by cheatgrass.

Grazing allotments:

There are not any active grazing allotments permitted on USFS lands adjacent to Bobcat Ridge. Any vacant allotments within this management area are by prescription to be eliminated.

Hunting:

Hunting is permitted on USFS lands during designated seasons. The USFS is aware of hunting that takes place to the west and north of the Bobcat Ridge Natural Area but is not aware of hunting on the in-holding parcels within the property. Access to federal lands from Bobcat Ridge is restricted since they are surrounded by non-public lands.

Trail Management:

There is no legal access to USFS trails/roads that cross the natural area boundary. Most trail use on adjacent lands is by hunters using ATVs. The USFS responded cautiously when asked about formalizing trail connections linking Bobcat Ridge to USFS lands since natural areas trails would be required to meet USFS standards and the concern that trail use may not be consistent with the flora, fauna, and wildlife management prescription for this area. The Forest Service is open to a trail easement agreement with the Natural Areas Program for the existing roads that cross through USFS land.

Weed Control:

The USFS is not actively managing weeds in the area.

2. Provide On-site Ranger Housing

This management plan recommends an on-site ranger to provide visitor services, law enforcement, and light maintenance at Bobcat Ridge Natural Area. An historic assessment will be done on the farm house to see if it should be renovated or replaced for the ranger's housing. The house will be either renovated or rebuilt in a style consistent with the history of the ranchstead. Renovations would include repairing the original wood siding, replacing non-original window with original window size and type, reconstructing the east porch, as well as updating the electrical, heating, ventilation, and plumbing systems.

3. Other Public Improvement

The table below is a list of anticipated public improvements that are probable based on experience gained at other natural areas. At this time costs are too hard to predict and are therefore not listed in this document.

Features	Comments
Public Improvements	
Entrance	
• Engineering Design	contractor costs
• Road improvements	access off of County Road 23
• Entrance Gate	electric gate
• Entrance/Site Sign	
• Parking Lot	natural surface, 25 car & six horse trailer parking spots
• Restrooms	vault toilets, no water
• Trailhead Kiosk	two panel style
• Benches	
• Trashcans	need bear proof cans at parking lot and picnic area
Structures and Infrastructure	
• Historic Cabin	
• Removal of debris/vehicles/etc.	
• Relocate Corrals	
• Picnic Shelter	along phase I trail
• Calving barn improvements	for possible future mounted patrol horses
Fencing	
• Boundary marking/fencing	signing and fencing
• Interior fencing (Hansen canal)	may not be necessary per NCWCD
Trails	
• Phase I, II, III trail design & construction	phased over three years
• Unneccessary road decommission	depends on condition of road/etc.
• Trail markers	
• Hazard tree removal	as necessary for visitor safety

Educational Features	
Maintenance	
Trash Removal & other labor	
Trail Maintenance	
Parking lot	including vault toilet upkeep
Weed Control	
Enforcement	
On-site Ranger	
Resource Management	
Grassland restoration	
Weed control (beyond maintenance)	fire and chemical treatment for 3 yrs
Fire rehab/soil erosion management	exact condition not yet understood
Riparian restorations	weed and erosion control
Irrigated crop fields	
Mahoney Park	
Drainages and streams	remove dams, restore natural flows

General Site Management

Below is a list of current visible concerns or needs and recommended actions to be completed before natural area opens to the public.

Administrative

- Develop protocol for full parking lot.
- Update neighbors on issues associated with CR 32C and involve them in trailhead parking design.
- Update property neighbors (south end of canal road) on decisions regarding possible southern access.
- Designate and make clear a road washout protocol for neighbors and visitors (CR32C).
- Set up visitor use monitoring (# visitors, types of uses, measures of use impacts).
- Complete renovations to Site Ranger's house.
- Hire and train a on-site ranger by early 2005.

Public Improvements – CR 32C Road Access

- Work with Larimer County Engineering Department to make any improvements to CR 32C.
- Clearly mark which private roads and route to public trailhead parking.
- Install roadside directional signs and "No parking on road" signs.

Public Improvements – Ranchstead Trailhead Parking

- Complete design of parking lot in 2005.
- Design & install entrance sign by spring 2006.
- Complete construction of parking lot and installation of vault-toilet by spring 2006.
- Install bear-proof trashcans by spring 2006.
- Install welcome kiosk with regulatory & educational information (see Chapter 7) prior to opening.
- Install fencing and gates with locks; remove any excessive fencing and gates by fall 2005.
- Locate site for phase I picnic area by September 2005.

Public Improvements – Trail Construction

- Construct trails (as described in Chapter 6).
- Install trail signs.
- Install interpretive signs.
- Decommission and restore unnecessary roads (as described in Chapter 6).

Chapter 9
Action Plan

9.1 Introduction

Management of Bobcat Ridge Natural Area presents several new challenges to the Natural Areas Program including the management of livestock grazing, management of fire-prone areas, habitat management for large herds of deer and elk, and associated herd management, hunting issues, and maintaining controlled access over a large backcountry area.

The Bobcat Ridge Natural Area Management Plan main purposes are to: 1) document the natural and cultural resources and outline steps to preserve and enhance these resources for the benefit of the citizens of Fort Collins in perpetuity; and 2) to identify recreation opportunities compatible with resource protection. The recommended actions listed in this chapter are based on analysis from previous chapters and present an overall management strategy for Bobcat Ridge Natural Area.

This plan identifies immediate needs to open this site to the public, and necessary actions to fully steward the natural area. These actions are subject to available funding and organizational capacity. For this reason, the actions listed below have been prioritized from 1 to 5 as indicated in the table below.

Numeric Ranking	Action items that ...
1	* Provide public safety * Are critical to open natural area to public * Provide immediate resource protection
2	* Are desirable prior to site opening * Enhance resources
3 & 4	* Are longer term resource protection projects * Investigate other uses and management tools * Investigate need for restoration * Are related to restoration
5	* Are desirable/ beneficial but not essential to management

9.2 Action Plan for Physical Resources

The physical resources presented in Chapter Two are topography, geology, soils, hydrology, watershed and scenic resources. Prevention of erosion and rehabilitation of eroded areas are essential to protecting soil and water quality. Although maintenance of air quality is largely a regional issue and beyond the scope of this management plan, management actions such as prescribed burning should be planned carefully to meet state and local standards.

Recommended Actions for Geologic Resources:

- (1) Do not allow rock climbing on fragile, easily erosive rock cliffs.
- (4) Assess site for potentially appropriate rock climbing area.

Recommended Actions for Soils:

- (1) Complete a grazing plan that is directed toward maintaining adequate plant cover to limit erosion on green ridge and hogback ridge soils.
- (1) Carefully engineer trails on valley soils to account for high shrink-swell potential, corrosiveness and general low strength of heavy-textured soils.
- (1) Complete soil assessment prior to construction of public improvements
- (3) Assess areas with high erosion potential and establish sufficient ground cover to prevent further erosion and improve water quality.
- (4) Complete soil assessment prior to restoration work.

Recommended Actions for Hydrologic Resources:

- (1) Design trails to keep people away from canal and post signs that canal area is closed to public.
- (2) Rehabilitate eroded drainages that were damaged by heavy rains following the 2000 Bobcat Gulch Fire. Establish sufficient ground cover over the burned areas for greater infiltration and reduction of sediment laden runoff.
- (3) Assess the hydrologic systems to better understand sources of wetlands and drainages.
- (3) Restore dammed drainages to ensure continued and natural hydrology of wetlands and drainages.

Recommended Actions for Scenic Resources:

- (2) Limit vehicle travel on site in order to reduce noise and improve air quality.
- (2) Design trail to provide scenic vistas of the unbroken landscape within the natural area.
- (3) Achieve state and local air quality standards during any management action such as prescribed burning for long-term air quality and visibility of scenic resources.
- (3) Aquire a conservation easement on adjacent lands
- (5) Investigate burying a portion of the power line through the grassland/meadow portions of the site.

Figure 9.1. Pasque flower

9.3 Vegetation and Plant Communities Action Plan

Plant communities and ecosystems are discussed in Chapter 3. The general goals and objectives are to enhance wildlife habitat value and native character through active restoration efforts and aggressive weed control. Management recommendations for each specific plant community are listed below. Issues concerning grazing or managing a burned forest are addressed in the appropriate vegetation community section of Chapter 3. Future grazing efforts will be directed toward curtailing the threats posed by non-native plants and maintaining the integrity of the desired plant communities through periodic disturbance.

Ponderosa Pine Woodland

The Ponderosa Pine Woodland is the most common ecosystem type of the foothills and montane elevations (6000-9000 feet) on the Front Range and it extends into adjacent Roosevelt National Forest. Ponderosa pine grows on warm dry slopes, is intolerant of shade, and grows well in full sun from bare mineral soil for germination and establishment. The severity of impacts of the 2000 Bobcat Gulch Fire on this community ranged from moderate to high. A majority of the 1,000 burned acres exhibit high severity impacts to both forest canopy and understory vegetation.

Objective: Allow natural regenerative processes to restore portions of the forest while aggressively controlling invasive weeds and undertaking proactive restoration efforts to reduce erosion and enhance the native character.

Recommended Actions for Ponderosa Pine Woodland:

- (1) Aggressively control weeds. Conduct routine monitoring to detect new invasions.
- (1) Complete a grazing plan.
- (2) Conduct inventory to determine locations of severe erosion and implement management measures designed to stabilize exposed soils and reduce soil loss.
- (3) Develop prescribed fire management plan to reduce probability of high intensity surface fires and contain the spread should one ignite.
- (3) Monitor re-establishment of ponderosa pine seedlings.
- (3) Explore creating a patchwork mosaic of small montane meadows (5–10 acres) to attract elk, deer and other browsers to the natural area.
- (3) Complete comprehensive site restoration plan.
- (4) Conduct a survey of bird use in burned areas to determine utilization by woodpeckers, flickers, nuthatch and similar species for cavity nesting, feeding, etc.
- (5) Conduct forest stand reconstruction to determine historic range of variability of forest density and disturbance regime.

Ponderosa Pine Savanna

The Ponderosa Pine Savanna system consists of widely spaced ponderosa pine trees over grassland parks or shrublands. It occurs at relatively lower elevations and on somewhat rockier substrates, making this system moderately drier than the Woodland system. The hallmark plant association of this system at Bobcat Ridge Natural Area is the Ponderosa Pine - Mountain Mahogany - Big Bluestem open woodland.

Objective: Enhance habitat value and native character through restoration efforts designed to eradicate weeds and maintain the system through periodic natural disturbance.

Recommended Actions for Ponderosa Pine Savanna:

- (1) Complete a gazing plan.
- (2) Target cool-season or dormant-season grazing to reduce cool-season, non-native species like cheatgrass.
- (3) Monitor vegetation recovery on the 2004 10-acre burn. Implement early season prescribed burning if area continues to demonstrate native plant recovery.
- (3) Complete comprehensive site restoration plan. Use composition and structural characteristics of existing patches of native grasslands as reference conditions for restoration goals.
- (4) Introduce small-scale dormant-season prescribed burns to reduce the abundance of widespread non-native species. Ensure burn timing and fire intensity are managed such that prescribed burning occurs prior to cheatgrass setting seed and burn at a low to moderate intensity to inhibit further establishment by undesirable species.
- (4) Once desired grassland composition and structure is achieved, proactively manage to mimic periodic natural disturbance processes including grazing and fire to sustain system diversity and health.

Lower Montane Foothills Shrubland

The Lower Montane-Foothills Shrubland system occupies the sandstone hogback that extends through the east side of the property. The expression of this system on Bobcat Ridge Natural Area is a mosaic of mountain mahogany plant associations. Cheatgrass is widespread through much of this habitat and is invading via bare soil patches that result from eroding sandstone bluffs.

Objective: Enhance habitat value and native character by restoration of native plant understory (grasses and forbs) through aggressive weed control.

Recommended Actions for Lower Montane Foothills Shrubland:

- (1) Complete a grazing plan.
- (2) Target cool-season and dormant-season (early spring) cattle grazing to eliminate non-native and invasive species like cheatgrass and Canada thistle.
- (2) Attempt to control cheatgrass with fall, herbicide treatments of 2oz/acre application of Plateau, use of herbicides or other methods must not impact the native shrubs.
- (3) Complete comprehensive site restoration plan.
- (4) Once desired grassland composition and structure is achieved, proactively manage to mimic periodic natural disturbance processes including grazing and fire to sustain system diversity and health.

Foothills Grassland

The Foothills Grassland system is a strong candidate for restoration at Bobcat Ridge Natural Area. Much of this area was historically converted to hay grasses resulting in a loss of natural diversity. However, patches of this system remain that can serve as reference sites for restoration goals.

Objective: Enhance habitat value and native character through restoration efforts designed to eradicate weeds and convert hay crop and pasture grasses to native grasses.

Recommended Actions for Foothills Grassland:

- (1) Cease most crop agriculture activities. One exception to this action is to continue growing alfalfa in the 18-acre pasture for the purpose of encouraging nesting populations of grasshopper sparrows. Delay first cutting of alfalfa until mid-August or later to accommodate fledging and foraging.
- (1) Complete a grazing plan.
- (2) Target cool-season or dormant-season grazing to reduce cool-season, non-native species like cheatgrass.
- (2) Investigate and better understand the habitat needs of grasshopper sparrows in the hay fields.
- (3) Complete comprehensive site restoration plan. Use composition and structural characteristics of existing patches of native grasslands as reference conditions for restoration goals.
- (4) Introduce small-scale dormant-season prescribed burns to reduce the abundance of widespread non-native species. Manage burn timing and fire intensity so that prescribed burning occurs prior to cheatgrass setting seed and burned at a low to moderate intensity to inhibit further establishment of undesirable species.
- (4) Once desired grassland composition and structure is achieved, proactively manage to mimic periodic natural disturbances including grazing and fire to sustain system diversity and health.

Lower Montane Riparian Woodlands

The Lower Montane Riparian Woodland system occupies the immediate area adjacent to stream drainages throughout Bobcat Ridge Natural Area. Altered hydrology (usually a lowered water table) combined with heavy grazing pressure, compromises the competitive edge of native species, allowing smooth brome and Canada thistle which are well established to invade from adjacent pastures.

Objective: Maintain and enhance vegetative quality of this natural community through restoration of natural hydrology and weed eradication.

Recommended Actions for Lower Montane Riparian Woodlands:

- (1) Pursue aggressive control of Canada thistle and smooth brome in riparian areas.
- (1) Conduct weed monitoring to determine the extent of Dalmatian toadflax. If found, use accepted methods of control to conduct aggressive eradication.
- (1) Carefully manage cattle grazing from riparian woodland areas through appropriate wildlife-friendly fencing.
- (1) Complete a grazing plan.
- (2) Identify source of hydrology at Brooks Canyon and ensure its persistence.
- (2) Evaluate the impact of stock tanks located in the upper reaches of these drainages and possibility of reducing natural water flow to lower elevation riparian areas.
- (2) Explore other opportunities to re-structure the pasture layout within the landscape.
- (3) Complete comprehensive site restoration plan.

Bell's Twinpod *(Physaria bellii)*

Bell's twinpod is a globally imperiled plant that occurs on sparsely vegetated red sandstone outcrops of the Ingleside Formation (hogbacks on the eastern edge of the property) within the Bobcat Ridge Natural Area. Bell's twinpod is most abundant where the vegetation is sparse at the top of the slope and in ephemeral drainage channels. The meadows at the base of the slopes are dominated by non-native grasses including smooth brome and cheatgrass.

Objective: Maintain and enhance existing population. Enhance conditions that perpetuate this species.

Recommended Actions for Bell's Twinpod:

- (1) Control weeds aggressively around known occurrences to reduce the threats from non-native and invasive species like cheatgrass and Canada thistle.
- (1) Limit cattle grazing in these areas until the effects are better understood.
- (3) Monitor populations every three to five years and provide periodic updates to the Colorado Natural Heritage Program's element occurrence tracking system.

9.4 Action Plan for Wildlife Management

Bobcat Ridge Natural Area provides habitat to diverse wildlife from insects to top carnivores. Chapter 4 discusses management issues in detail and recommendations pertaining to the resident wildlife. Habitat protection and enhancement through seasonal closures and buffer zones are the focus of wildlife management at Bobcat Ridge. Listed below are specific management recommendations by wildlife grouping:

Elk and Deer

Objective: Optimize habitat value and protect critical range(s).

Recommended Actions for Deer and Elk:

- (1) Determine the densities, distribution, critical range, and movement corridors for deer and elk.
- (2) Employ best management practices related to visitor management to prevent disturbance during mating and calving seasons.
- (2) Establish a monitoring plan to identify the dynamics of plant community response to management decisions related to cattle grazing, presence/absence of hunting, etc.
- (2) Identify critical indicators that would trigger the need to reduce herd numbers.
- (3) Monitor for animals exhibiting symptoms of Chronic Wasting Disease; work with CDOW to mitigate.
- (3) Explore creating a patchwork mosaic of small montane meadows (5-10 acres) to attract elk, deer and other browsers to the natural area.
- (3) Implement corrective measure to prevent declines in health of habitat (e.g., riparian areas) prior to, or as soon as habitat degradation is detected.
- (3) Evaluate location and design of fences to ensure minimal impediment to wildlife movement/migration.

Black-tailed Prairie Dogs

Objective: Maintain stable populations that are balanced with other conservation goals.

Recommended Actions for Black-tailed Prairie Dogs:

- (1) Determine intervention measures to be taken in the event of a plague epizootic.
- (2) Consider predator enhancements and trail locations to encourage a balanced predator/prey relationship.
- (3) Determine sustainable prairie dog densities and implement a plan to support recommended numbers.
- (3) Install educational features describing the benefits of prairie dogs and associated species.

Preble's Meadow Jumping Mouse (Zapus hudsonius preblei)

Potential habitat has already been found and mapped as a sensitive resource area. The portion of the natural area in Buffum Canyon adjacent to CR 32C was surveyed and no Preble's meadow jumping mice were detected.

Objective: Optimize habitat quality including riparian areas and adjunct grasslands to encourage the repopulation of native jumping mice.

Recommended Actions for Preble's Meadow Jumping Mouse:

- (1) Survey specific potential habitat areas to be disturbed prior to any public improvement construction.
- (3) Determine the presence/absence of jumping mice on interior locations. If not found, determine whether known mice populations would be able to colonize portions of Bobcat Ridge.
- (3) Conduct an assessment of the functioning condition of riparian areas and adjacent grasslands if occurrences of Preble's are documented or if it is determined that migration corridors exist that could connect Bobcat Ridge with known populations.
- (3) Inventory and examine the sources of hydrology (overland runoff, springs and seeps) to determine the extent of impact due to grazing. Initial survey will also be necessary to determine sources of erosion, and erosion damage done along drainages and stream banks.
- (4) Depending on outcome, these additional actions may be recommended:
  - Restore natural hydrology to drainages. This may include removal of stock tanks, and implementing soil erosion prevention practices.
  - Eliminate grazing from riparian areas, and buffer these areas 100 feet back as to provide for adjacent grassland. This may require some form of fencing while grazing lease is active.
  - Advance soil protection measures to ensure severely burned areas are not sediment loading drainages or eroding stream banks.
  - Monitor and coordinate with US Fish and Wildlife Services

Carnivores

Objective: Optimize and protect habitat.

Recommended Actions for Carnivores:

- (1) Identify sensitive habitat including den sites and ensure protection of the areas.
- (1) Strictly enforce regulations regarding "Leave No Trace" and where recreation activity can occur.
- (1) Establish buffer zones and avoid disturbance of areas where prey is abundant.
- (1) Educate visitors about human–wildlife conflicts.
- (4) Allow and manage for returning predator species and populations

Bats

All bats are considered species of concern. Townsend's big-eared bat Corynorhimus townsendii pallescens has been observed on the property and is a species of special concern at the State and Federal level. Other bats are likely to occur and hunt in the area.

Objective: Optimize habitat value.

Recommended Actions for Bats:

- (1) Identify and protect existing and potential roost and hibernation sites.
- (2) Work with external agencies such as the US Geological Survey, Colorado Bat Society and Bat Conservation International to determine species presence on Bobcat Ridge.

Birds

Objective: Optimize habitat value and protect breeding, migration, summer, winter and year-round ranges.

Recommended Actions for Birds:

- (1) Establish buffer zones and close sensitive areas in need of protection.
- (1) Maintain and monitor agricultural field in southeast corner for grasshopper sparrow population until better understood.
- (1) Install wildlife "escape ladders" in water stock tanks.
- (3) Maintain or restore the riparian corridor communities to provide for resident or migratory species.
- (4) Manage portions of burned areas in standing dead trees for cavity nesters.
- (4) Maintain or restore mountain shrub communities to provide for resident and migratory species.
- (4) Manage for increasing nectar sources for resident and migrating hummingbirds.
- (5) Monitor for presence of mosquito-borne virus or other diseases

Moths and Butterflies

Objectives: Maintain occurrences of documented rare butterfly species and provide for habitat requirements of those species listed as possible occurrences.

Recommended Actions for Moths and Butterflies:

- (1) Maintain larval host plants and nectar sources are available.
- (3) Enhance population of larval host plants and nectar sources.
- (4) Investigate the life cycle requirements of the butterfly species tracked by CNHP that could be expected at Bobcat Ridge.
- (4) Evaluate whether those habitat requirements are physically represented at Bobcat Ridge.
- (4) Continue surveying and monitoring for species and habitat elements.
- (4) Restore habitat areas suitable for colonization and migratory stopover.

9.5 Cultural Resources Action Plan

Figure 9.2. Arrowhead

Bobcat Ridge Natural Area has historic and cultural resources representative of the Colorado Front Range foothills. These are categorized as historical and archaeological resources. Historical resources include the cabins and homesteads, the ranchstead and associated buildings, and two grave sites near the ranchstead farmhouse. The archaeological resources include a tipi ring and a small collection of Native American artifacts (figure 9.2). These resources are discussed in detail in Chapter 6.

Objective: Actively preserve some of the historical and archaeological resources for public benefit and interpret the significant human history of the site including the pre-settlement and settlement periods and the site's land use history.

Recommended Actions for Historical Resources:

- (1) Evaluate for preservation or removal of the boxcar, calving shed, pens, corral and hayshed. Leave the chicken house, pioneer barn, equipment shed, and poultry shed as is for interpretation purposes.
- (1) Preserve and restore the cabin at northeast part of the property. Interpret daily life of that era and possibly specific family history.
- (2) Pursue grant funding for historic structure assessment and stabilize buildings in need of attention.
- (5) Research who built and occupied the cabins on Green Ridge and in Mahoney Park. Leave cabin remnants as is; possibly interpret their history.
- (5) Further research the settlement history and previous ownership of parcels within Bobcat Ridge Natural Area for interpretation purposes.
- (5) Research who is buried in the graves near the ranchstead farmhouse.

Recommended Actions for Archaeological Resources:

- (1) Conduct archaeological reconnaissance prior to of any ground-disturbing projects.
- (1) Consult with the Colorado State Historic Preservation Office and the State Archaeologist before publicizing and developing archaeological sites for interpretive purposes.
- (1) Erect permanent fencing around the tipi ring and surrounding area to protect potential archaeological data until more conclusive examination can be completed.
- (3) Develop interpretation materials concerning use by Native Americans if warranted by further investigation.
- (5) As the need arises or as funding becomes available, conduct additional surface reconnaissance especially focusing upon selected areas whose natural topography is known to have high potential for archaeological resources such as rock cliff faces, ledges, overhangs, hogback ridges and their east-facing slopes, as well as ravines, springs, and creeks.

9.6 Visitor Use Action Plan

Visitor uses, including some new to the Natural Areas Program, have been analyzed in Chapter 6. A trail system that considers both visitor enjoyment and protection of the resources is being designed. The approximate layout of this trail can be seen in figure 6.1. Public improvements necessary to implement this visitor use and trail plan are budgeted for implementation in 2005.

Objective: Provide a variety of recreational opportunities for people of all ages and abilities consistent with the Natural Areas Program's mission, carrying capacity of the site, and the program's capacity to deliver a safe, high quality visitor experience.

Recommended Actions for Visitor Use:

- Provide new opportunities for recreation:
    * (1) Provide an Americans with Disabilities Act compliant trail, picnic shelter, and wayside picnic areas.
    * (3) Determine the feasibility to offer "by permit-only" designated backcountry camping opportunities on a trial basis.
    * (3) Analyze and consider possibilities for hunting. Hunting at this site may be a necessary ecosystem management tool. Any consideration of hunting will strongly emphasize wildlife and vegetation management, visitor safety, safety of the Natural Areas and Trails Rangers, and the Natural Areas Program's ability to enforce hunting regulations.
    * (4) Analyze site for rock climbing and/or bouldering possibilities. If prospective locations exist, provide opportunities based on ecological and safety considerations.
- Protect visitors, natural and cultural resources:
    * (1) Due to the sensitive nature of the resources, prohibit dog use (leashed or unleashed) on site; classify as a "sensitive" site.
    * (1) Manage timing and location of some recreational uses to protect critical habitats as described in Chapter 4, including the area east of canal, the hogback ridges, drainages, etc.
    * (1) Prohibit rock climbing on hogback areas on eastern portion of the property to protect sensitive habitat and for public safety (rock may not be safe for climbing).
    * (1) Do not develop car campground camping at this site due to the extensive infrastructure, management, and enforcement required.
    * (1) Designate portions of Bobcat Ridge closed or as "on-trail only" use. These designations protect visitors from falling trees in burned areas, avoid interaction with cattle operations, and minimize disturbance to sensitive resources. Areas not posted as closed or on trail will be available for dispersed use for foot travel only.
    * (1) Bikes and equestrians will be restricted to on-trail only through-out the site.
    * (1) Designate the Brooks Canyon area as limited public access area and provide guided tours.
    * (1) Clearly mark the boundaries of Bobcat Ridge Natural Area.

- Ranger Patrol and Emergency Response:
    * (1) Rangers will not conduct routine patrol via vehicle or ATV's.
    * (1) Work with the Colorado Division of Wildlife to manage hunting activities on Bobcat Ridge.
    * (1) Determine the necessity of two (southern and northern) emergency access roads prior to Phase I trail construction.
    * (1) Determine if a southern helicopter landing zone site is needed and if so, where it should be located.
    * (2) Incorporate a horse stable, corral and barn for the potential future mounted patrol program into the design of the parking area.
    * (4) Create a mounted patrol program when determined necessary.
- Education and Interpretation Related to Visitor Use:
    * (1) Incorporate "Leave No Trace" information in educational products.
    * (2) Provide regular guided birding and wildlife viewing field trips.
    * (2) Provide regular guided cultural history talks.
    * (2) Develop a guided field trip schedule for Brooks Canyon as this area is recommended for public access by guided field trip only.
    * (3) Create a self-guided nature/cultural walk to offer more education and outreach with less staffing time.
    * (3) Create educational products to assist the public understand the cattle grazing operations.

Recommended Actions for Trail System Construction:

- (1) Phase I – Valley Loop (construct prior to opening). Construct Valley Loop Trail.
    * Permit hiking, horseback riding, and mountain biking on designated Phase 1 trails.
    * Construct an ADA compliant trail from the trailhead parking lot to the picnic shelter.
    * Design trails to minimize the opportunity for visitors to create unwanted social trails.
    * Work with ranchers to locate trail in existing cattle pastures. Install cattle guards, spring-loaded pedestrian gates and other features to mitigate potential cattle and visitor conflicts.
    * Design trails to minimize wildlife impacts.

- (2) Phase II – Mountain Loop (construct within three years). Construct Mountain Loop and designate separate uses.
    * Designate the north trail for hiking and equestrians only (no mountain biking).
    * Remove hazardous dead trees on each side of the trails within the burned area.
    * Design portions of the trails specifically for biking and multiple-use interests in mind.
    * Design trail layout to access scenic vistas.
    * Determine suitable location and number of wayside picnic areas which are "pack in - pack out" areas.
    * Design trails to minimize wildlife impacts.

- (4) Phase III – Eden Valley Extension (construct within five years). This trail provides access for the neighbors to the south. This will be walk-in only (no parking lot).
    * Construct trail extension to Eden Valley area. Establish a neighborhood trailhead.

Recommended Actions for Future Planning:

- (2) Develop baseline wildlife surveys to determine effect visitation may have.
- (3) Complete a mini-plan to identify designated backcountry campsites, permit administration system, and other relevant management issues.
- (3) Evaluate hunting as a possible future management tool and determine the feasibility of mixing limited hunting with other recreation uses/visitors.
- (4) Conduct inventory in mountain area for potential climbing areas.

Figure 9.3. Bobcat Ridge at sunset (photo courtesy of Rob Meining)

9.7 Education and Outreach Action Plan

The educational opportunities at Bobcat Ridge are numerous. The focus of the education is on ecological processes, cultural history, and visitor management and the challenges land managing agencies face. The education will help citizens understand and better appreciate the commitment the program has to well-managed lands.

Figure 9.4. Students learning about local plants and wildlife

Overall Interpretive Theme: Bobcat Ridge Natural Area is a land of surprising diversity in its landscapes, history, plants and wildlife.

Recommended Actions for Education:

- (1) Design and install interpretive panels, features, and entrance kiosk.
- (1) Place strong emphasis on Leave No Trace ethics that help inform about visitor impacts and how to use the land in a sustainable fashion.
- (1) Consult with the Colorado State Historic Preservation Office and the State Archaeologist before publicizing and developing archaeological site for interpretive purposes.
- (2) Help visitors understand forest fire ecology, cultural history, diversity of flora, fauna, geology, and on-going management operations.
- (2) Develop self guided interpretive walks and brochures.
- (2) Provide guided birding and wildlife viewing field trips in a manner that will not disturb nesting or other sensitive wildlife activities.
- (2) Create a site specific brochure including trail map and regulations.
- (4) Compile species lists/brochures.

9.8 Site Administration Action Plan

Property stewardship began at Bobcat Ridge following its acquisition in December 2003. Management activities that have been completed to date include a complete inventory and mapping of existing roads, structures and other features, removal of unnecessary fencing and trash, perimeter boundary marking, and signage indicating closure of the site prior to opening.

A series of administrative and public improvement measures will need to be completed prior to Bobcat Ridge's formal opening to the public. Details of those improvements can be found in Chapter 8 of this document and are summarized below:

Recommended Actions for Administration:

- (1) Complete renovations or replacement of site ranger's house.
- (1) Hire and train on-site ranger in early 2005.
- (1) Update neighbors on issues associated with CR 32C and inform them of trailhead parking design.
- (2) Develop protocol for full parking lot.
- (2) Designate and make clear a road washout protocol for neighbors and visitors (CR32C).
- (2) Set up visitor use monitoring (# visitors, types of uses, measures of use impacts).
- (2) Inform property neighbors (south end of canal road) on decisions regarding possible southern access.

Recommended Actions for Public Improvements for CR32C Road Access:

- (1) Work with Larimer County Engineering Department to make any improvements to CR32C.
- (1) Clearly mark private roads and route to public trailhead parking.
- (1) Install roadside directional signs and "No parking on road" signs.

Recommended Actions for Public Improvements for Trailhead Parking:

- (1) Design and construct parking lot.
- (1) Design and install entrance sign.
- (1) Install a vault toilet.
- (1) Install bear-proof trashcans.
- (1) Install welcome kiosk with regulatory and educational information.
- (1) Install fencing and gates with locks; remove any excessive fencing and gates.
- (2) Construct picnic shelters.

Recommended Actions for Public Improvements for Trail Construction:

- (1) Construct Phase I trail before site opening.
- (1) Install trail signs before site opening.
- (1) Install interpretive signs before site opening.
- (1) Decommission and restore Phase I unnecessary roads.
- (2) Design and implement trail phases II & III.

Appendix 1

City Council Approved Natural Areas Acquisition Considerations

Pulliam Ranch, Masonville, CO

On April 1, 2003, City of Fort Collins City Council adopted resolution 2003-051 that established a set of seven considerations (in no priority order) as a general guide for the Natural Areas Program in land conservation and acquisition efforts. Briefly respond to the following questions and provide additional information if necessary.

1. Is the current landowner a willing seller/donor? (choose one)
   - **a. Yes, owner is making partial / whole donation**
   - b. Yes, seller is highly motivated
   - c. Yes, seller is willing to negotiate
   - d. No, not willing to sell or negotiate

2. Describe the potential recreation opportunities for this property. (choose one)
   - **a. High appropriate recreation opportunity with extensive public access**
   - b. Moderate appropriate recreation opportunity with limited public access
   - c. No recreation opportunity (explain) _____

3. Describe the ecological value of this property.
   - **a. High - the property is large or native or hosts rare species/communities *or* is a critical wildlife corridor**
   - b. Moderate - the property has important but not unusual ecological values
   - c. Moderate – the property has some values and needs some restoration
   - d. Low – the property requires significant ecological restoration

4. What is the anticipated acquisition cost for this property? (state the amount)
   $5.5 Million

5. Estimate the long-term stewardship costs for this property?
   - a. General Operations: $75,000 annually
   - b. Public Improvements: $830,000 one-time cost
   - c. Restoration: $50,000 annually
   - e. Education: $50-100,000 one-time/annual cost

6. Describe the property's geographic proximity to Fort Collins.
    a. Within City Limits
    b. Less than 30 minutes from the City
    c. 30 – 60 minutes from the City

7. Describe the threat to the integrity of the property's natural resource values (choose one).
    a. Development is imminent (includes subdivision to 35-acre parcels)
    b. Development is anticipated to occur within 3 years
    c. Development is anticipated to occur within 5 – 10 years
    d. Property is non-growth/low threat area

Based on questions 1 – 7, in your opinion would conservation of this property be of significant public benefit to the citizens of Fort Collins? (Yes or no and please explain)

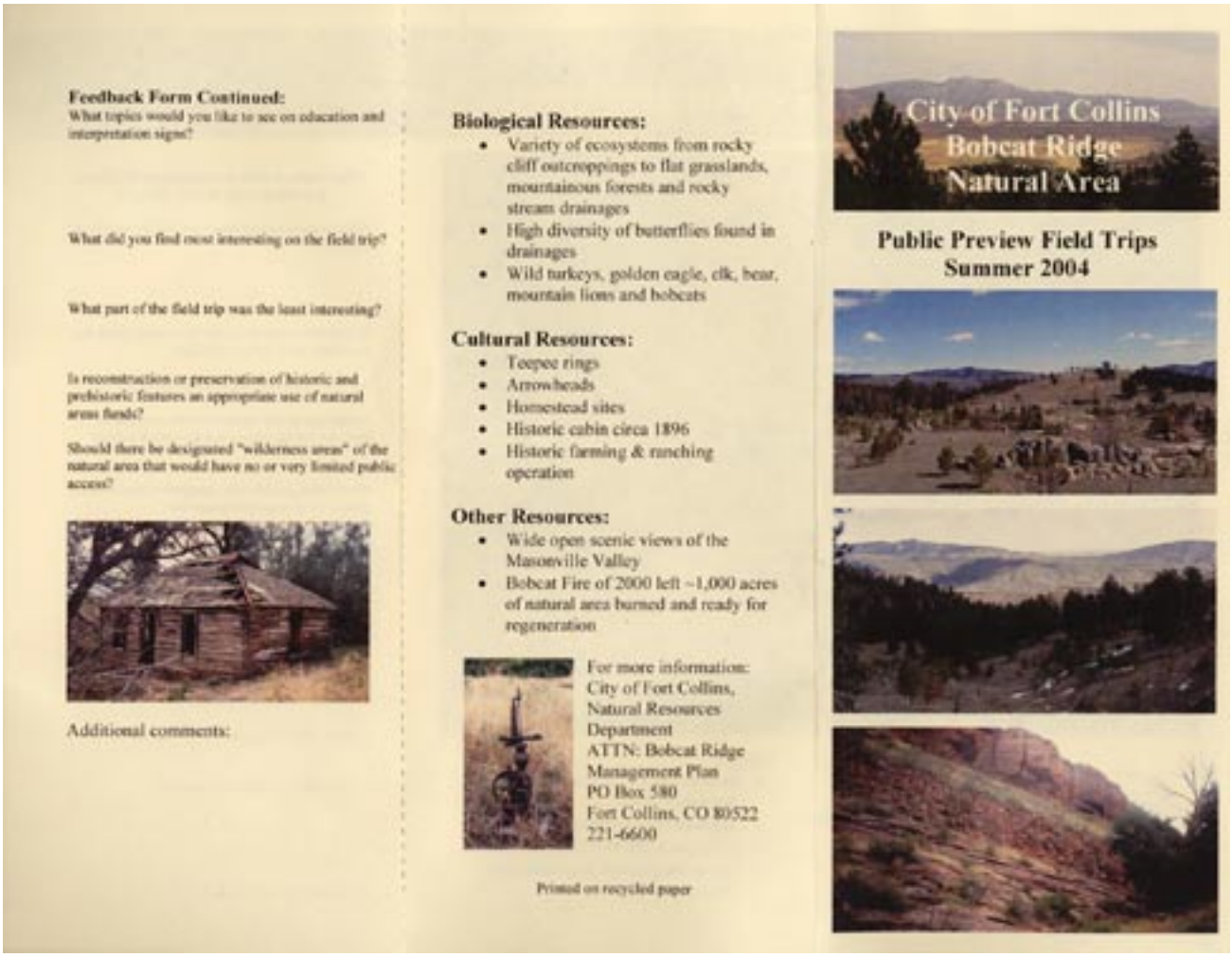
Yes, because of the extensive natural resources, abundant wildlife, close proximity to Fort Collins this property would be of significant public benefit for natural, scenic and recreational resources.

Appendix 2

As part of the public outreach process the Natural Areas Program conducted twelve tours of Bobcat Ridge, eight of which were specifically for the public, to introduce people to the site. The tours occurred from June through October, 2004. In addition to the natural area tours, three open houses, two of which were specifically for the public, were held to provide information on staff-recommended management actions for Bobcat Ridge. The open houses took place on November 3, November 17 and December 8, 2004.

The following tables summarize the feedback collected from tour and open house attendees. The first set of tables shows the percentage of respondents who gave that answer for the stated question listed in the field trip brochure. The last table provides all additional comments that did not fit into a specific category from the questionnaire.

Bobcat Ridge Tour Brochure – outside cover



Feedback Form Continued:
What topics would you like to see on education and interpretation signs?

What did you find most interesting on the field trip?

What part of the field trip was the least interesting?

Is reconstruction or preservation of historic and prehistoric features an appropriate use of natural areas funds?

Should there be designated "wilderness areas" of the natural area that would have no or very limited public access?

Additional comments:

Biological Resources:
- Variety of ecosystems from rocky cliff outcroppings to flat grasslands, mountainous forests and rocky stream drainages
- High diversity of butterflies found in drainages
- Wild turkeys, golden eagle, elk, bear, mountain lions and bobcats

Cultural Resources:
- Teepee rings
- Arrowheads
- Homestead sites
- Historic cabin circa 1896
- Historic farming & ranching operation

Other Resources:
- Wide open scenic views of the Masonville Valley
- Bobcat Fire of 2000 left ~1,000 acres of natural area burned and ready for regeneration

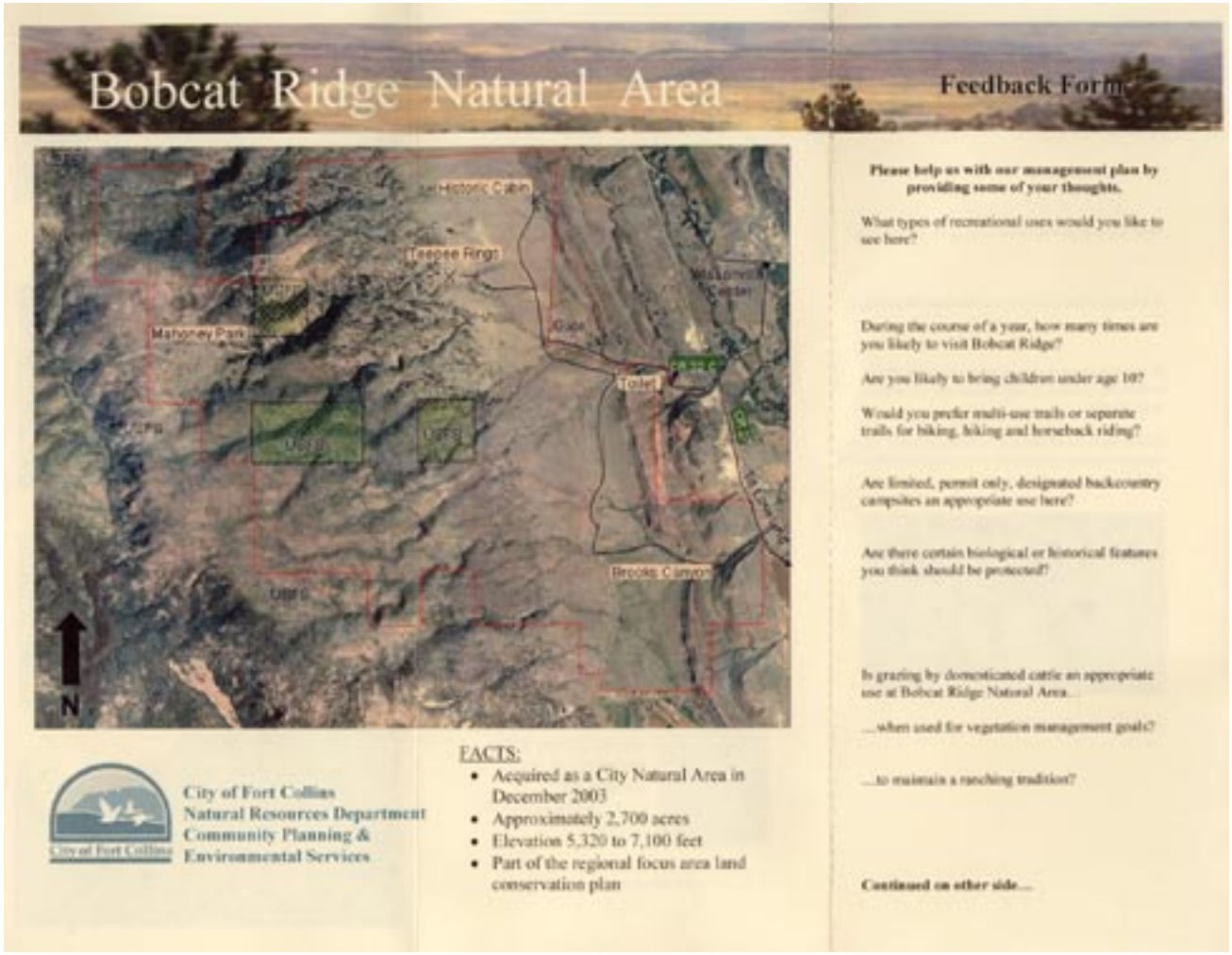
For more information:
City of Fort Collins,
Natural Resources
Department
ATTN: Bobcat Ridge
Management Plan
PO Box 580
Fort Collins, CO 80522
221-6600

Printed on recycled paper

City of Fort Collins
Bobcat Ridge
Natural Area

Public Preview Field Trips
Summer 2004

Bobcat Ridge Tour Brochure – inside cover



Bobcat Ridge Natural Area

Feedback Form

Please help us with our management plan by providing some of your thoughts.

What types of recreational uses would you like to see here?

During the course of a year, how many times are you likely to visit Bobcat Ridge?

Are you likely to bring children under age 10?

Would you prefer multi-use trails or separate trails for biking, hiking and horseback riding?

Are limited, permit only, designated backcountry campsites an appropriate use here?

Are there certain biological or historical features you think should be protected?

Is grazing by domesticated cattle an appropriate use at Bobcat Ridge Natural Area...

...when used for vegetation management goals?

...to maintain a ranching tradition?

Continued on other side...

City of Fort Collins
Natural Resources Department
Community Planning &
Environmental Services

FACTS:

- Acquired as a City Natural Area in December 2003
- Approximately 2,700 acres
- Elevation 5,320 to 7,100 feet
- Part of the regional focus area land conservation plan

Appendix 3

All comments from all feedback forms (181) & open house cards

What types of recreational uses would you like to see here?

Recreation Types		
Backcountry Camping	7	2%
Biking	54	13%
Birdwatching	21	5%
Camping (Other)	25	6%
Education	7	2%
Hiking	136	33%
Horseback	57	14%
Hunting	7	2%
Picnicking	22	5%
Tours/Nature Walks	16	4%
Other: (see below)	56	14%

No dogs: 14 (including extra comments below):

- No Dogs (some owners turn loose, not all safe - even on dog leash on narrow trails, little motivation to "pick up"),
- Thanks for NO DOGS! Too disturbing to wildlife
- Dogs-NO. I see too many off leash in leash areas & I've been 'nipped' by a leashed dog. Seems to be plenty of other areas for dog walking.
- Dogs would be the last allowed to use the area.

Allow dogs on leash 7: (including comment below):

- I would like to see the property open to dogs on leash with a one strike rule. If a ranger contacts an animal owner with the animal off leash, the dog is prohibited from the park.

No mountain bikers 10: (including comments below):

- No bikes (no appreciation of aesthetics eyes only on trail ahead, go too fast downhill, Lots of other places to take dogs, horses and bikes).
- I support some areas (this one?) for "non-bike use". I am a biker, however
- We need at least one nice place like this which keeps trail bikes out.

Other comments on mountain bike use:

- I would like to see bicycling minimized or carefully controlled. I love to bicycle on the road and I know other love the trails, but I know that mountain bikes can really tear up a trail, especially steeper ones. Thus, I would recommend creating trails that have an easy grade. I would recommend against visible switchbacks whenever possible to minimize shortcutting.
- I'd like to see a lot of attention given to trail design in regards to mountain biking.
- Biking on service roads only

- If Mtn bikes allowed - enforce trail use & etiquette
- I'd like to see bicycle access limited due to trail erosion and need for two trail systems
- Mountain bikers do not follow regulations. They endanger hikers' lives by speeding and refusing to yield. I support separate trails for hikers and cyclists!
- The City should move away from their anti-mountain bike stance.

No Horses: 4

- Horses tear up turf. Horse trailers take up too much parking space. Seems to be plenty of other areas for horseback riding.
- Trailers rob parking space, "road apples"

Other horse comments:

- Make horses wear the horse diapers.
- Control weeds by making horses wear horse diapers - people carry out their horses droppings.

No motorized vehicles: 9

- Patrol on Horseback (2)
- No ATVs.
- No motorized activity, except maintenance and enforcement.

Motorized vehicles: 2 (including comments below)

- Some 4-wheel drive area
- 1-2 roads with vehicle access for wildlife viewing areas, picnicking area near the cabin with car access
- Since I don't hike it would be great if I could drive (or use a shuttle) to scenic areas or wildlife viewing areas.

Allow Rock Climbing: 1

No rock climbing: 4 (including comments below):

- Rock Climbing in not appropriate here - find other places not as sensitive.
- Don't like idea of rock climbing - users too noisy and ruin natural area experience. Also too damaging to resources (wildlife disturbances, habitat, plant community destruction)

No Camping: 3

- Limited camping: 4 (including comments below)
- If camping considered - only below teepee rings and away from trails and only boy scouts and the like
- Allow individual backcountry camping as well as group camping. Provide latrine at backcountry camping areas so the sites won't be damaged.
- Camp area for hunters

Allow hunting: 2 (including comments below)

- Hunting could be properly managed, as a culling tool.
- Would like to suggest that hunting be considered but only open for youth hunters accompanied by a mentor (Father, Uncle, Etc).
- How are you guys planning on managing the wildlife? What about letting the Colorado Division of Wildlife manage it and have some sort of lottery?
- Hunting is traditional on this property. Keep it up - even if on permit only basis

No hunting: 6 (including comments below)

- I would be concerned to have hunting co-existing with hiking, biking and other recreational activities here. In addition to concerns for safety, it would certainly lessen my natural experience to hear gun shots or see animals being killed.
- I'm opposed to hunting. Too dangerous!
- NO recreational hunting. This is not the visitor experience I want.
- I'm not against hunting in general, but hunting where people are simultaneously hiking is worrisome.
- I strongly prefer that there be no hunting allowed. We avoid Lory State Park during hunting season - it's just not safe.
- No hunting until time and real studies indicates that hunting would be beneficial to the area.

Other recreational uses/comments:

Llama hiking (4)
Cross country skiing (5)
Snowshoe (2)
Running
Running trails - include canal pond!
Wildlife Tracking
Nature interpretation
Passive Activities
Orienteering
Picnic areas accessible to elderly
No Picnicking
Wildflower admirers, geology studies, riparian studies….
Regional trail connections
Geology of area
Good to offer family-oriented activities up there to bring the younger families out that far away
Eliminate noise pollution or keep all noise out.
Human foot traffic only
Foot trails only. The loop to the cabin was good. You could see up close the valley and rocks and see west Mtns. Then while at teepee rings you could see to the east
Let people hike anywhere they want.
Eliminate on-trail on designations for hikers only. I.e. Mtn biking and horses should be on-trail only everywhere. Have trails, but let people walking (only) go off trail at will.
NO RVs!!
Will be a very popular place - don't open it to everything.

During the course of a year, how many times are you likely to visit Bobcat Ridge?

Average: 6-7

- Depends on management plan
- For hunting only
- Once trails are established I plan to frequent the area.
- Am willing to let wildlife alone

Are you likely to bring children under the age of 10?

Children<10	
Yes	29%
No	71%

- Start teaching outdoors habits while they are young.
- If educational purposes

Would you prefer multi-use trails or separate trails for biking, hiking and horseback riding?

Multi-Use/Separated	
Multi-Use	23%
Separated	77%

Both:

- Separated for the main one; others combined
- Separated except on service roads
- I like the idea of setting it up like Horsetooth Park trails.
- Probably prefer different trails, but multi-use is OK
- Separate if possible, Multi-use OK
- Primarily separated, but some trails (such as roads) could serve as both
- Variety of single use/multi-use trails

Separate:

- If separate it would be for ecological purpose
- Separated, depending on terrain, etc
- Separate, unless you don't have the funding
- Separated, especially in the lower half of the property
- Single use trails resolve conflicts between hikers, bikers and equestrians yet limit what each trail offers visibility to. Austin, TX offers parallel single use trails. That seemed a good resolution.

Hiking only trail:

- Some multi-use, a few specific for hiking
- Separated, Don't want biking or horses
- Separate, biking and horseback can be one trail, have hiking trail for hiking only
- Separate, but combining bike & horse okay
- Separate, but prefer hiking only

- Separate hiking, combine bike & horses
- Hiking-separate, biking & horseback-together
- Maintain separate use classes for trails, bikes & horses separate from hiking. Destination hike only to Mahoney Park, no loop.
- Horse only trail:
- Separated for horses
- Separate the horses
- Multi, except for horses
- Separated for horseback
- Biking & Hiking-OK, Horseback-separate
- Separate trails for biking and hiking OK, horseback riding separate

Bike only trail:

- Separate off bikes; horses and foot trails OK together
- I don't like hiking where there are bikes
- Biking separate, hiking & horseback OK combined
- Good to keep biking separate from hikers, allow llamas on regular hiking trails.
- We urge you to separate bike and hiking trails
- Separate mountain bikers from others. It's disturbing to always have to move out of their way. All of BR should be on-trail only. Great on the accessible trail idea. I know people who would love this!
- Separate bike from hiking except when it doesn't make sense
- Keep mountain biking on valley loop trail ONLY. Keep "grand" loop for horses, people on foot, llamas only. Do not separate trail used on "grand" loop. Site should be on-trail only to protect wildlife.

Multi-use:

- Great Project! Hope mountain biking could be integrated into all trails
- Multi-use or separate parallel trails
- Depends - if shared, trails need to be built so bikes do minimum damage

Other comments concerning the trails:

- A loop trail would be great.
- A foot trail south and then east from Mahoney Park back to the parking lot would be nice
- Property Comments: Build & design the trails correctly and user conflicts will not be existent. Loop outer trail immediately - out & backs cause conflicts.
- I'm strongly in favor of a hikers-only trail. As someone who hikes on the Foothills trail in the Maxwell Natural Area four to five times per week, I see a lot of mountain bikers violating the yield rules (most don't yield to hikers nor do they give a verbal warning) and dog owners violating the leash law (even if they have their dog on a leash, they often don't have it under control - too much slack, so the dogs lunge at us and try to bite us. My partner was bitten by a dog on the Foothills Trail recently. Thanks for the opportunity to comment!
- Mountain High Trail Assoc. is very interested in being involved in planning consultation and construction n trails and educating riders about multi-use ethics on these new trails.
- It's a beautiful site and great asset to the City. I'd love to see the trail have a overlook of the spot just past Mahoney Park looking out to Longs Peak.

- Minimal trail improvement to retain natural look. Variety of trails (short, med or long loops, bird watching - good viewing points, riparian areas, woods, scenic, degree of difficulty). Wooded Area (part unrestored after fire, part restored/planted after fire). A prime and varied area close to urban areas - be watchful to prevent overuse destroying it naturalness (NO Starbucks at trailhead :)) Strive for simplicity to preserve a "wilderness and natural" area.
- I think off trail hiking should be allowed but not encouraged. I think Horsetooth Mtn Park and Lory State Park are good models of what the public expects and how ex-ranches can be made public.
- One or several main trails done as loops with cutoffs for length/degree of difficulty variance. Dedicated trail to avoid County road is good.
- I would like to see trail routes before answering
- Why do humans have to be in there?
- Don't pave any trails

Are limited, permit only, designated backcountry campsites an appropriate use here?

Backcountry Camping	
Yes	72%
No	28%

Yes comments:

- Very limited (3)
- I'd want to know how "in-demand" sites @ Lory are - only do this if other sites are overcrowded
- On the western side
- Experimental
- As long as there is no negative impact
- Some cabins would be good
- I would like to see the park have backcountry camping but not to have developed campsites for vehicles. Permits should also be used.
- Like permit backcountry camp sites, but not group site.

No comments:

- Foot travel only and day use only. It already burned.
- If it is possible to manage, preferably NO
- Don't believe the area is rugged enough to interest backpackers
- I would prefer day use only. There are many campsites available nearby

Maybe: (6)

- But why?
- Would have to assess impact
- Stoves only
- In more "fire resistant" sites

Are there certain biological or historical features you think should be protected?

Bio/Historical Protection	
Brooks Canyon	4%
Cabin	25%
Cliffs	4%
Fire Area	2%
Native Plants	6%
Plum Tree	1%
Ranch Features	4%
Sensitive Bird/Wildlife Areas	9%
Streams	6%
Teepee	22%
Other	15%

Cultural Resources:

- Historical Protection - Yes if features are identified by surveys and found to be worthy
- The old cabin should be preserved as it might have looked at the turn of the century
- The historic building should all be retained. The cabin ruins should be interpreted (as should all the buildings and structures); the second cabin could be restored! Most of the corrals and animal sheds can be used for the public and/or the rangers horses
- All historical sites/features should be protected otherwise they'll be gone forever
- Farm houses as museums??
- No matter what the age it can have something to say about the homesteading history of the area
- Yes and no, depends on the age and importance to time
- Old Stoves
- Yes, the buildings and corrals at the entrance and nesting areas during nesting season
- Don't spend much on these old buildings, corrals. It's just not worth it. Maybe restore just the cabin near NE corner - get rid of chicken house, barn.
- The Born site

Natural Resources:

- All listed cultural and biological with emphasis on birds and flowers
- Water Features should be protected for wildlife. Can the cabin really be protected?
- Geology (4): Need geological feature of interest markers
- As well as all natural features
- A management plan that attempts to restore native fauna & flora
- No climbing on east rims, do not extend vehicle travel to public, only for Nix crew to work. Who ranched it and up to how the City purchased.
- Property should be managed with the best interests of the land and wildlife in mind. I trust the archeological assessment with regards to history.

- I don't know enough about what is there, but am all for preservation & protecting wildlife habitat
- Keep natural as natural as possible
- All of the biological plants and animals
- I feel all the resources mentioned on the yellow board should be protected, to some extent - not off limits, maybe w/interpretive signs. The least important to me is the fire b/c it is so small and fast fire that didn't seem to do extensive damage to the soil (I guess I'm just referring to the grass fire last summer), I would like some more info on the Bobcat Ridge Fire area.
- Remove all dams that pond water for cattle!
- Keep cows out of the creek and riparian areas. Add prairie dogs - see article in Fall 04 issue of Nature...Conservancy magazine on prairie ecology and management
- Buck and Rail fence along irrigation to deter wildlife. Provide watering tanks near the ditch to deter wildlife from jumping the fence to get water.
- Please do not allow public access east of the irrigation ditch
- Remove existing fences to restore natural wildlife habitat.

Other/everything:

- Yes, I think the project sounds well researched and areas needing that protection will receive it.
- I think the area should be "open" but with good management so use does not 'spoil' the features
- All available to save
- All mentioned on this
- Anything rare
- Not sure, if something unique needs protection
- Encourage trail use
- Leave no trace and take nothing should be highlighted

Is grazing by domesticated cattle an appropriate use at Bobcat Ridge Natural Area…
... when used for vegetation management goals?

Grazing - Veg	
Yes	74%
No	26%

Yes comments/Maybe: (9)

- Goats would be better
- Needs more study
- Bison would be better
- Try goats :)
- No Cattle, perhaps some other animal
- Only if staff agrees, limited
- Preferably no, but some limited use if appropriate
- Limited to low lands only

- Don't overgraze
- Questionable

No comments:

- No. If vet manage goals require cattle you should rethink your goals
- No! Definitely not! No! Cattle are very destructive
- I like the use/introduction of natural disturbances to manage for species. I wasn't sure if grazing by cattle is considered "natural". I do agree that if done properly, grazing is a very useful management tool.

...to maintain ranching tradition?

Grazing - Ranch	
Yes	51%
No	49%

Yes comments/ Maybe:

- Partially, and if you add educational info on best management practices and sustainability you could have a nice demonstration project to show ranchers (with CSU)
- Yes, more! w/story of history, over grazing by the west in the past to proper management of today
- But not as much
- Only if compatible w/vet management
- If doesn't interfere with other activities
- Only if grazing is limited and kept away from drainages/riparian areas
- Maybe
- Limited (2)
- As long as it does not expand
- Not important, however it would generate funds for use in maintenance of the site

No comments:

- No! not Nat Res job
- No. ranching tradition my ass! Like this needs to be "preserved" in CO?
- No, I don't know much about this issue, but I don't think that cows are particularly good for the ecosystem. Again, I think it will be well researched to protect the natural area.
- There are other sites for this
- No, unless it conflicts with someone's livelihood
- I think it is a risk to have livestock roaming with the public, especially if the public needs to be responsible for opening and closing gates
- No, return to natural-native grasses
- No! not to allow cattle to graze for free. Cattle prevent native plants (e.g. grasses) to reproduce. Non-native plants then take over.
- I strongly feel cattle grazing just to keep ranching tradition is STUPID! and should only be allowed for vegetation control (or whatever would be a sound ecological reason).
- NO - It's not a ranch anymore, it's public land

Other grazing comments in general:

- If not too many
- Both - when done properly (sustainably) ranching can be a valuable part of the ecology
- Yes part of Western Heritage but limit to prevent overgrazing
- On partial areas
- Yes, and horses, goats, llamas, alpaca
- Yes and valuable to user experience
- Except for bad drainage on road
- But fenced away from trail
- Keep them out of riparian and hiking trail areas
- We see enough cows - don't keep them here too
- Please do not allow cattle to graze at this natural are! I went on a hike to climb a mountain in Moab, UT and there were smelly cows and cow droppings everywhere in which I stepped in later coming back from the hike. I cannot stress enough how inconvenient and frustrating it is to have to dodge cow manure. If cows were allowed to graze then I might as well be hiking and camping in a cow field, YUCK!
- No, they can be too destructive
- No livestock at or above teepee rings.
- Serves no sustainable purpose here
- I favor eliminating grazing by phasing it out over a period years using grazing as a vegetation management tool.

What topics would you like to see on education and interpretation signs?

Education Topics	
Birds/Wildlife	21%
Cultural Heritage	10%
Fire Area	6%
Flora/Vegetation	23%
Geology	14%
Historical Features	15%
Other (see below)	12%

Comments on signage/method of education/interpretation:

- Interpretive signs
- Not too many signs!
- Keep signage "natural" in keeping w/surroundings
- Signs lined up and what you can see - like at Coyote Ridge has
- Same as Coyote Ridge
- Good interpretation please, include appropriate signs - good trailhead signs with interpretive, cultural, natural history. Have outreach program w/kid groups and school. Get kids there
- Guides, posted stations, available literature or brochures for events

Ecology:

- Flora medicinal uses, look-out maps signs and names
- Ecosystem - how all elements interrelate
- Transition zone info, general ecology of the area
- Forest Ecology
- Signs about birds, mammals and plants, warning signs about rattlesnakes
- Restoration Progress

Maps:

- Maps, altitude info
- A good map
- Miles exactly spelled out
- Mileage & Maps
- Trail maps
- I hope they'll provide trail maps when area is open.
- Fairly detailed maps to show routes to areas of special interest (show mileage, degree of difficulty, elevation)
- Trail Maps (Mileage, points of interest, elevation).
- Explanation of things to observe and respect; maps of trails (length and altitude) and info on Hansen Canal

Human Impact/ Cultural Resources / Other:

- The ridge shows what damage & to what extent a careless campfire can do
- Importance of keeping the area clean
- The impact of humans on "so-called" natural areas.
- Inter-connectedness; ranching
- Multi-use trail etiquette (3)
- History of the families associated with the site; history of ranching and related contexts i.e. stone industry; geological and natural resources identified and described; native American history & the fire in 2000
- Great presentation, eventually, some more recreation planning maps (i.e. trails, etc). Settlement and pre-settlement historical education plans - what are the plans for native - information/education of? I'm sure the Native peoples' decedents of the original teepee ring-makers would love to visit those sites.
- As a student of Natural Resources and with a love of nature I totally support Natural Areas. I am especially pleased with the plan to develop the cultural history - A project I would love to do an internship with:
- Names of nearby rocks
- Boundaries need to be marked

What did you find most interesting on this field trip?

Most Interesting	
Birds/Wildlife	13%
Brooks Canyon	6%
Cabin	7%
Cattle/Ranch/Cowpies	1%
Fire Area	5%
Flora/Vegetation	7%
Geology	6%
Landscape	24%
Mahoney Park	3%
Teepee	11%
Other (see below)	17%

Diversity of ecosystems and topography:

- The whole place (2)
- Just overall general trip - beautiful area!
- Diversity
- Vast, much to explore, varied terrain
- Diversity of terrain and ecosystems
- Topography
- The ability to see changes as we gained elevation
- Range of ecosystems
- Variety of eco systems
- The variety of eco-systems
- The transition from lowlands to mountains, and the hawks nest

Wildlife:

- Enjoyed being in pines saw a western tanager
- Sighting Wildlife - 1 elk, 2 deer, 3 hawks
- Seeing the fledglings

Cultural Resources:

- Historical sites
- That there is great history of Indian passage and future with its new owners.
- History of area
- Homestead
- The ranch house and building and yard, thrasher & combine & Hansen Canal

Quiet/other:

- Unspoiled quiet
- Quiet & Peacefulness
- To hear & see the creek
- Riparian area

- Ecology, history
- Openness
- The hillside
- Mahoney Park Preservation
- Just being out on the land, enjoyed the walking
- The closeness and similarity to Horsetooth Mt. Park
- View of Long's Peak
- Seeing that we are taking steps to preserve land.
- Connections to other public areas

What part of the field trip was the least interesting?

Least Interesting	
Cabin	13%
Cattle/Ranch/Cowpies	6%
Fire Area	7%
Flora/Vegetation	1%
Man-made (fence/roads/etc)	5%
Other (see below)	7%

- Low area hiking in road
- Bottom part from the start
- The hill
- The hike to Mahoney Park
- Open fields, farmhouse
- Pond (Yucky!-overgrown)
- Would have liked to see some animals
- Watching cattle impact the open space.
- Preservation of old, rickety buildings (demolish them)
- Better area mapping
- Didn't get to burn area.
- Didn't get to top of hill
- Van ride/ drive (3)
- Pre-hike
- Doing this!
- Rock in my shoe
- Rain
- Horses
- Sometimes too much talking about non-related things

Is reconstruction or preservation of historic and prehistoric features an appropriate use of Natural Areas funds?

Preservation	
Yes	88%
No	12%

Yes comments:

- We don't have much of this kind of preservation. We have it. Let's preserve it.
- Up to 30% total funds
- Yes, disturb as little as possible
- Make it a tourist attraction
- Preservation only (2)
- Preservation only, limited to bare essentials if at all. Original is best
- I believe that the preservation of historic and prehistoric features is appropriate use of natural area funds but not reconstruction. Leave it as it and just provide a barrier and sign with important information if necessary that does not allow humans to trample and damage what is valuable
- Preservation of prehistoric features
- But maybe not reconstruction
- Yes, but to much less extent than trails & trail maintenance
- But invest in the trails first
- Yes, as part of the maintenance
- Perhaps not restoration, but more "dilapidation arrest"
- Not too much, let some of it just decay away
- Maybe: (3)
- If there are any significant natural features
- If features are worth it
- If it complements the public's use of the site
- If significant
- Limited (3)
- Sometimes expensive
- Maybe-not if impacting other acquisitions significantly
- Good Question - what does legislation say? Maybe not.

No comments:

- No, but NA could seek other funding
- No, let historical society
- Use historic preservation funds
- That seems like a stretch
- Maintenance of forest and range should be done by forest and range management professionals.

Should there be designated "wilderness areas" of the natural area that would have no or very limited public access?

Limited Public Access	
Yes	68%
No	32%

Yes comments:

- I'm a strong believer in wilderness areas as sanctuaries that should be allowed to exist on their own and not necessarily for use by humans. Not all areas should be set aside, of course, but maybe some of the landscape that has seen little use via recreation and/or extraction, grazing, etc could see very limited use
- Only if important for wildlife habitat and limited access
- Yes - for hunters only
- Yes, for sensitive wildlife
- To protect fragile areas, yes
- Yes, especially is needed for the ecosystem health.
- Yes - private tours
- Yes, but chosen carefully for specific reasons
- Only during nesting of offspring time or migratory times
- In sensitive areas
- Yes, if there was an area sensitive to wildlife
- For wildlife only
- If appropriate for preservation
- To prevent erosion and damage
- Low usage but open to the public
- Yes if adjoins other habitat - pretty small for real wilderness, could have seasonal habitat closures
- Yes. The foothill from the creek in brooks canyon and to the south of it has been a haven for many wild animals and birds for over 114 years and has not been and should not be disrupted by people. Cattle are fine as they have been there too over the years. I'm sure there are other areas I can find out about.
- There should be at least 2,000 acres of the 2,700 designated as wilderness areas that would have limited public access. I think this natural area needs to provide some sanctuary or wildlife refuge to animals, vegetation, and birds. The world has access to everything it seems and we tend to abuse natural entities
- Yes! ALL of it.
- That might be wise
- Sensitive vegetation
- Yes, but minimal
- Do what you need to in order to make it last.
- If necessary
- Limited (3)
- Maybe

No comments:

- No - manage like HT Mtn Park and Lory SP - except no hunting
- When trails are fully developed, travel should be on them only
- BRNA should be "trail only" this site has no "wilderness" characteristics
- Limited to foot traffic
- Having areas w/limited trail access is fine but off trail foot access should be allowed
- This is the wrong definition of wilderness. Foot traffic only should always be allowed.
- What is point of a park w/o public access?
- Taxpayer bought
- No, full use with discretion

Additional Comments

- Good rest room up higher would be good.
- Don't lump llama's with other livestock!
- No smoking much appreciated
- Keep it no smoking!
- Keep as much natural as possible.
- Leave nature alone
- Humans cannot and too often won't follow legal and ethical rules and regulation. Putting aside open space should not be for human use & benefit. We are not the only creatures with the right to life.
- I hope development of this area will be accomplished in a reasonable time frame and that the City will provide opportunities for volunteers
- I call our FC Natural Areas whole program "quick, before it's gone". Strongly support the selected use of "wilderness" classification.
- Too much "management" by the City is bad - ex: Pineridge Natural Area
- It's close to town - put more resources here rather than distant areas
- We are residents of Masonville, very happy to see this land protected. Keep the area natural.
- Thanks for the opportunity to explore - it's a fine area and location, will be a valuable open lands area. Keep up the good work - looking forward to using it.
- The City of Fort Collins made a wise decision to purchase and preserve this site. Within a few years it would not have been available and home development would have claimed it. I am anxious to see what you plan to do with Soapstone.
- Need larger map of trails, need vicinity map in relation to County Open Spaces, Parks, and Lory State Park.
- Wonderful tour, great hiking, this is a beautiful place and I would like to see it maintained in its natural state
- I think it's terrific to have places like this preserved
- Pleased that Fort Collins is owner
- Very enjoyable and convenient location. Beautiful planning with lots of prospects for trails development. Good luck planning!
- A great addition to the City.

- Great Place! Can't wait to come back.
- Very interesting walk in a great place. So glad it has been set aside for the future enjoyment of Fort Collins citizens.
- Thanks for the opportunity, scheduled naturalist trips would be great
- Can't wait for it to open! Have birding trips to canyon!
- Please keep canyon open for guided birding trips
- Great purchase, keep brooks canyon open thanks!
- We have a treasure for Fort Collins and Larimer County
- Natural Resources is to be commended for their foresight in acquiring this and other natural areas and open space land. What a site!
- Great tour, excited for it to be opened to the public. I think for preserved sites, teepee, burial, cabin, etc... we should have a guided tour weekly, monthly.
- Great name Bobcat Ridge. Good variety of terrain. Close to town.
- Would like to be a part of this - I've been over all of it on horse
- It was a fun day and enjoyed the company with the other people. I'm glad that Fort Collins is preserving the Bobcat Ridge

Appendix 4

Significant Mammalian Species Likely to be Present

Common Name	Scientific Name	Family	Habitat Types*	Elevation Range (ft)	CDOW Status
American Elk	*Cervus elaphus nelsoni*	Cervidae	2 – 6	6,000 – 13,000	Big-Game
Mule Deer	*Hemionus hemionus*	Cervidae	2 – 6	3,000 – 13,000	Big-Game
Coyote	*Canis latrans*	Canidae	1 – 7	3,000 – 14,500	Furbearer
Red Fox	*Vulpes macroura*	Canidae	1 – 2 4 – 6	3,000 – 14,500	Non-Native Furbearer
Black Bear	*Americanus amblyceps*	Ursidae	2 4 – 7	4,500 – 11,500	Big-Game
Raccoon	*Procyon lotor*	Procyoniade	1, 2, 5	3,000 – 10,000	Furbearer
Striped Skunk	*Mephitis mephitis*	Mustelidae	1	3,000 – 10,000	Furbearer
Mountain Lion	*Puma concolor*	Felidae	2 – 6	3,000 – 12,500	Big-Game
Bobcat	*Lynx rufus*	Felidae	2 – 7	3,000 – 14,500	Furbearer
Black-tailed Prairie Dog	*Cynomys ludovicianus*	Sciuridae	1, 3, 4	3,000 – 6,500	State Species of Concern
Abert's Squirrel	*Sciurus aberti*	Sciuridae	2, 4, 5	5,000 – 9,000	Small-Game
Common Porcupine	*Erethizon dorsatum*	Erethizontidae	2 – 7	3,000 – 14,500	Not-Listed
Rock Squirrel	*Variegatus grammurus*	Sciuridae	1 – 7	3,000 – 8,300	Not-Listed
Bat spp.		Chiroptera			Federal or State Species of Concern

*Habitat Types:

1. Urban and Croplands
2. Riparian/ Wetlands
3. Grasslands
4. Shrublands
5. Forestlands
6. Tundra
7. Unvegetated, Exposed-Rock

Significant Mammalian Species of Possible Occurrence

Common Name	Scientific Name	Family	Habitat Types*	Elevation Range (ft)	CDOW Status
Gray Fox	*Cinffeoargenteus scottii*	Canidae	2 – 5 7	5,500 – 13,000	Not-Listed
Western Spotted Skunk	*Gracilis gracilis*	Mustelidae	4, 5, 7	4,000 – 8,000	Not-Listed
Bighorn Sheep	*Ovis canadensis*	Bovidae	2 – 7	4,500 – 14,500	Big-Game
White-tailed Deer	*Odocoileus virginianus*	Cervidae	2 – 5	3,000 – 12,000	Big-Game
Yellow-Bellied Marmot	*Marmota flaviventris*	Sciuridae	2 4 – 7	5,400 – 14,500	Small-Game
American Badger	*Taxus berlandier*	Mustelidae	2 – 6	4,500 – 14,500	Furbearer
Preble's meadow jumping mouse	*Zapus hudsonius preblei*	Zapodidae	1 – 3	4,000 – 8,500	Federally threatened and State Species of Special Concern

* Habitat Types: see footnote for previous table

Appendix 5

Big Thompson River

Potential Conservation Area

Biodiversity Rank: B2 (Very high biodiversity significance)

The Big Thompson River site supports a good (B-ranked), an average (C-ranked) and four poor (D-ranked) occurrence of the globally- and state-imperiled (G5T2 S1) Preble's meadow jumping mouse (Zapus hudsonius preblei), a subspecies designated as sensitive (Forest Service), as federally threatened, and as a species of special concern (State of Colorado).

Protection Urgency Rank: P2 (High urgency)

It is estimated that stresses may reduce the viability of the Preble's meadow jumping mice in the potential conservation area if protection action is not taken.

Management Urgency Rank: M3 (Moderate urgency)

New management actions may be needed within five years to maintain the current quality of the jumping mouse occurrences.

Location: This potential conservation area eastern boundary is at the confluence of Buckhorn Creek and the Big Thompson River west of Loveland, Colorado. The western boundary extends to Glen Haven and Glen Comfort, Colorado. This conservation area can be accessed by taking Colorado Highway 34 west along the Big Thompson River Canyon and along the Devils Gulch Road through Glen Haven, Colorado.

Legal Description:

U.S.G.S. 7.5-minute quadrangles: Horsetooth Reservoir, Masonville, Buckhorn Mountain, Drake, Crystal Mountain, Glen Haven.

T005N R069W 6,7
T005N R070W 1-12, 16-20
T005N R071W 1-3,7-9, 12, 15-19
T005N R072W 12-14, 23-24

T006N R070W 3-10, 14-20, 22, 23, 26, 27, 29, 30-32, 35, 36
T006N R071W 1-3, 10-14, 23-27, 29-35
T006N R072W 23-27

T007N R070W 19, 30, 31-33
T007N R071W 3, 4 , 7-10, 13-18 , 23-26

Size: 17,820 acres (7,210 hectares)

Elevation: 5,085 – 7,400 feet (1,550 - 2,250 meters)

General Description: The Big Thompson River flows west to east in southern Larimer County. This conservation area includes much of the Big Thompson River and Buckhorn Creek, plus the following major tributaries: Bear Gulch, North Fork of the Big Thompson River, and Dry Creek.

The riparian vegetation is dominated by willow (*Salix spp.*) with scattered stands of cottonwood (*Populus spp.*). Also found in these mesic habitats are snowberry (*Symphoricarpos occidentalis*), wild rose (*Rosa woodsii*), and mountain mahogany (*Cercocarpus montanus*). Stream banks retain native graminoid vegetation in the form of sedges (*Carex spp.*) and rushes (*Juncus spp.*). Surrounding uplands are generally midgrass prairie with pine stands (*Pinus ponderosa*).

Biodiversity Rank Comments: This potential conservation area is of high global significance because it is probably one of the best-known occurrences of a globally-rare subspecies. This may be one of the most extensive populations of Preble's meadow jumping mice within the South Platte River drainage. This potential conservation area that incorporates the Big Thompson River and the associated tributaries provides protection from stochastic events that may affect portions of the Big Thompson River population or segments of the population within tributaries. This complex of mainstem waterway and tributaries lends a degree of protection from such stochastic events that might jeopardize a more homogenous population that is susceptible to site-specific catastrophic events. This potential conservation area includes the habitat parameters that are likely critical to Prebles' jumping mouse persistence: dense herbaceous and shrub riparian communities and upland grassland communities free from urban impacts.

Boundary Justification: The boundaries of this conservation area were defined based on the presence of Preble's meadow jumping mice throughout the system. The boundary includes 300 meters on either side of the associated creek. This is designed to include the riparian vegetation and associated upland grass communities that have been documented as part of Preble's meadow jumping mouse habitat. The distance of 300 meters was intended to be conservative, likely including a greater amount of upland community than most mice will utilize, but sufficient in all circumstances to ensure persistence of jumping mice. A better approximation of this potential conservation area would be the area that includes the 100-year floodplain and an additional 100 meters of adjacent upland habitat. Until these data layers are available for all areas within the conservation area, this conservation boundary should provide the persistence of the Preble's meadow jumping mouse in this area.

Table . Natural Heritage element occurrences at the Big Thompson River PCA.

Element	Common Name	Global Rank	State Rank	Federal Status	State Status	Federal Sensitive	EO* Rank	Last Observed	Number of EO*
Mammals									
Zapus hudsonius preblei	Preble's meadow jumping mouse	G5T2	S1	T	SC	FS	B	1998-08	1
Zapus hudsonius preblei	Preble's meadow jumping mouse	G5T2	S1	T	SC	FS	C	1998-08	1
Zapus hudsonius preblei	Preble's meadow jumping mouse	G5T2	S1	T	SC	FS	D	1998-08	4

**EO = Element Occurance*

Protection Rank Comments: Likely the biggest threats to this conservation area are development impacts, recreational use and management of water resources. Although this area currently has relatively little urbanization residential development continues to grow. It is important to understand the impact residential development may have on reducing the amount of riparian and upland habitat available to Preble's meadow jumping mice. In areas of Colorado that have intensive urban development Preble's meadow jumping mice are no longer found.

Recreational use is heavy throughout the Big Thompson River conservation area, and such impacts to riparian and upland grassland habitats could reduce jumping mouse abundance. The Preble's meadow jumping mouse has been shown to tolerate low levels of recreational use (hiking trails) in riparian communities, but such impacts should be mitigated to improve riparian shrubland and herbaceous cover.

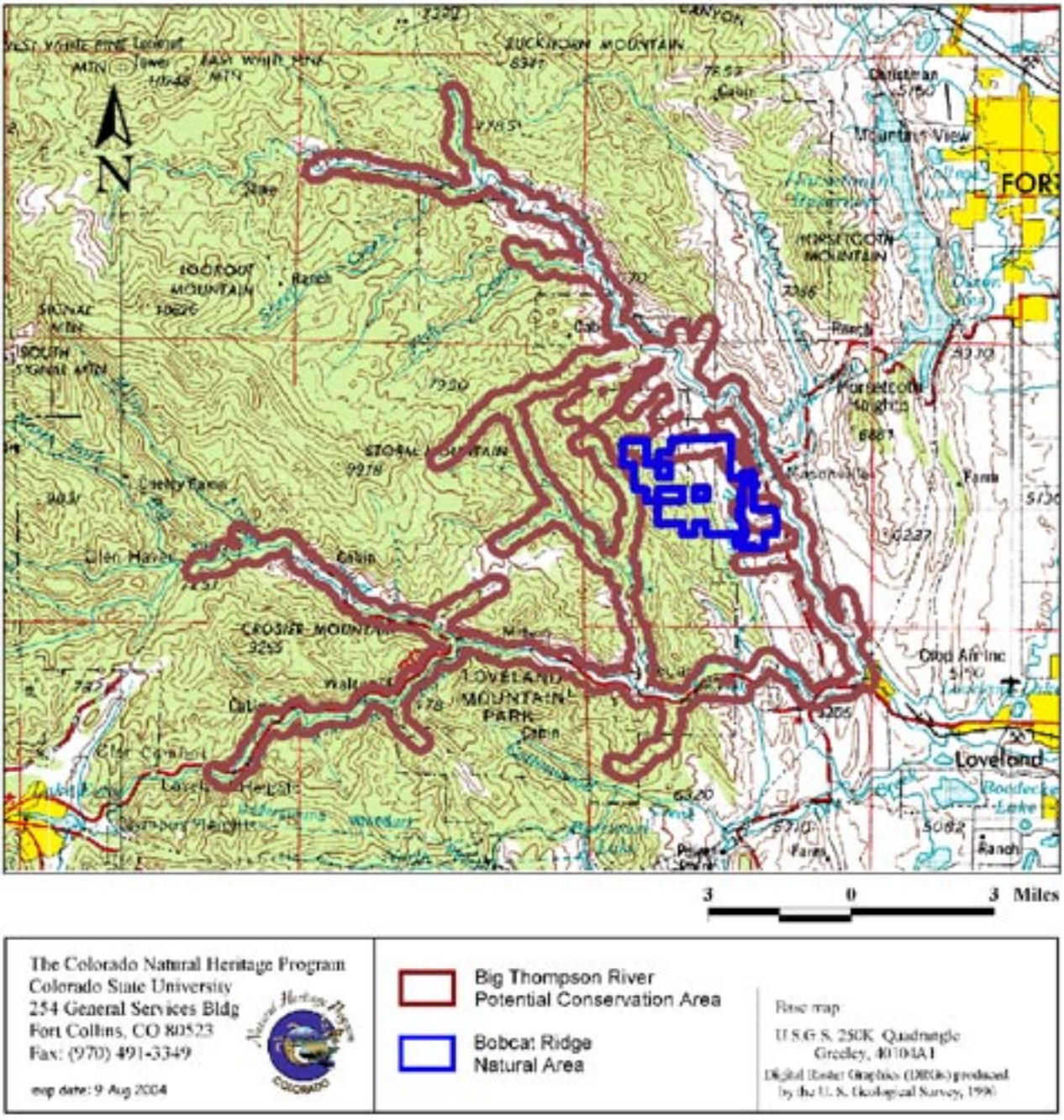
In areas where creeks and streams no longer flow at historic levels the riparian habitat has reduced in size and density. Such water flow impacts can jeopardize the persistence of jumping mice by decreasing the amount of available riparian habitat. Maintaining historic flows or increasing the water table in such areas can restore the riparian vegetation and maintain jumping mouse abundances.

Management Rank Comments: Of the utmost importance to ensuring the persistence of the jumping mouse populations within this conservation area is the continued management of habitats within the Big Thompson River drainage. It is essential to ensure that development in and around riparian corridors provide both riparian and upland habitat for jumping mice. Jumping mice have been documented using upland habitats and it is possible that habitats that only include riparian communities will not be sufficient for jumping mouse persistence.

Minimizing the extent to which riparian corridors are impacted by recreational use will ensure that jumping mice can utilize the riparian cover and vegetation. Although intensive recreational use can reduce available habitat, well-mitigated impacts can provide sufficient habitat for jumping mice.

Current management strategies on ranches may be sufficient to maintain jumping mouse populations at their current level; however, restricting impacts such as excessive grazing and compaction of soils near riparian systems will likely increase jumping mouse populations. Grazing can restrict the expanse of riparian shrub communities and thus, restrict the ability for Preble's meadow jumping mice to utilize the area. However, mild grazing pressure may not affect the population.

Big Thompson River
Potential Conservation Area



Appendix 6

PREBLE'S MEADOW JUMPING MOUSE SURVEY REPORT FOR THE BOBCAT NATURAL AREA PROJECT SITE IN LARIMER COUNTY, COLORADO

Submitted To:

Robert Zakely
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P. O. Box 580
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Submitted By:

Jan Peterson, Ph.D.
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September 10, 2004

I. INTRODUCTION

This report summarizes results from a trapping survey conducted to determine the presence or absence of Preble's meadow jumping mouse (*Zapus hudsonius preblei*) at the Bobcat Natural Area project site in Larimer County, Colorado. Z. h. preblei was officially listed as a threatened species by U. S. Fish and Wildlife Service on May 13, 1998. This species has a limited range, occurring only along the Rocky Mountain Front Range in Colorado and in the southern part of Wyoming (Armstrong 1972).

The area surveyed is situated approximately 0.4 mile west of the Masonville Post Office (see topographic and aerial maps in Appendices 1 and 2). The City of Fort Collins plans to construct a parking area and trailhead near the survey site. Photographs of the site are included in Appendix 3 and specific UTM coordinates for the survey site are provided in Appendix 4.

All aspects of this trapping survey, including the habitat assessment, were conducted in compliance with the Revised Interim Survey Guidelines of the U. S. Fish and Wildlife Service (2004). The survey was restricted to the immediate vicinity of the project site, and results contained herein are not applicable to any other area.

Site Description and History

The survey site is located along an unnamed drainage near Buffum Canyon, southwest of Masonville, Colorado. Red sandstone cliffs run along both sides of the drainage, and in some places appear to be over 30 m high. County Road 32C parallels the drainage and in spots is within 2 m or so from the water. Overstory vegetation here is dominated by narrowleaf and Plains cottonwood (*Populus angustifolia and P. deltoides*), although boxelder (*Acer negundo*) also occurs. Smooth brome (*Bromopsis inermis*) is the dominant grass in the understory, although orchard grass (*Dactylis glomerata*), and Kentucky bluegrass (*Poa pratensis L.*) are also present, but uncommon. Shrubs in the area include gray rabbitbrush (*Chrysothamnus nauseosus*), snowberry (*Symphoricarpos albus L.*), skunkbrush (*Rhus trilobata*), mountain mahogany (*Cercocarpus montanus*), and wild currant (*Ribes cereum*). Other plant species observed at this site include flixweed (*Descurainia sophia L.*), stinging nettles (*Urtica gracilis*), several species of thistle (*Cirsium spp.*), common burdock (*Arctium minus*), marshelder (*Iva xanthifolia*), great mullein (*Verbascum thapsus L.*), silver sage (*Artemisia frigida*), yucca (*Yucca glauca*), prickly lettuce (*Lactuca serriola*), curly dock (*Rumex crispus*), watercress (*Nasturtium officinale*), mint (*Mentha arvensis L.*), hound's tongue (*Cynoglossum officinale L*), and virgin's bower (*Clematis ligusticifolia*).

II. METHODS

This survey was conducted in accordance with the Interim Survey Guidelines for Preble's Meadow Jumping Mouse (USFWS 2004). Photographs were taken to describe and document the habitat and dominant/common plant species were recorded. Daily weather conditions, as well as those preceding the surveys were also noted.

Non-folding Sherman live traps were baited with sweet feed and set each afternoon after 1700 hours and then checked each morning from 0700-0830 hours. Traps remained closed throughout the day. Precautions were taken as outlined by the Center for Disease Control for hantavirus protection, and traps were emptied and disinfected after the survey with a 10% bleach solution. All animals caught were released at point of capture.

The survey began on the evening of August 24, 2004, when 175 traps were laid out and set in two transects beginning just across the road from the entrance to the natural area and running east along the south bank of the creek for approximately 0.1 mile. Transects ran along both sides of the stream and in some cases were less than 5 m apart due to the narrow drainage. Several traps were within 1 m of CR 32C. Individual traps were often placed less than 5 m of one another. The survey concluded on August 28, 2004, when traps were picked up, emptied, and subsequently disinfected. Four nights of trapping resulted in a total of 700 trap nights.

Weather on the day preceding the survey was partly cloudy and mild with high temperatures in the high 70's to low 80's and lows in the 50's. Thunderstorms occurred in the afternoon. During the survey, high temperatures varied from the mid 50's to mid 70's with lows in the upper 30's and low 40's and afternoon thunderstorms each day.

III. RESULTS AND DISCUSSION

During a total of 700 trap nights, 10 long-tailed voles (*Microtus longicaudus*), 18 Mexican woodrats (*Neotoma mexicana*), 97 deer mice (*Peromyscus maniculatus*), and 10 Northern rock mice (*P. nasutus*) were captured. The trapping success rate here was relatively high, 19.2 %, possibly the result of abundant food resources and a paucity of urban predators.

IV. SUMMARY

A trapping survey was conducted to determine the presence or absence of Preble's meadow jumping mice along an unnamed drainage near Masonville in Larimer County, Colorado. During a total of 700 trapnights, 135 rodents were captured and no Preble's meadow jumping mice were detected. Therefore, it is my recommendation that the Bobcat Natural Area project proposed for this site by the City of Fort Collins not be delayed based solely on concerns regarding this threatened species.

V. LITERATURE CITED

Armstrong, D. A. 1972. Distribution of mammals in Colorado. Monograph of the Museum of Natural History, University of Kansas. No. 3. 415 pp.

U. S. Fish and Wildlife Service. 2004. Interim Survey Guidelines for Preble's Meadow Jumping Mouse. Ecological Services, Colorado Field Office. Denver, CO. 15 pp.

Appendix 7

Avian species recorded as of September 18, 2004

Common Name	Scientific Name	Family	Habitat Types*	Elevation (ft)/ Range	Nesting Preference
Swans, Geese, Ducks					
Mallard	*Anas platyrhynchos*	Anatidae	1 – 7	3,000 – 11,000 Year-round	Ground
American Vultures					
Turkey Vulture	*Cathartes aura*	Cathartidae	1 – 7	3,000 – 9,000 Breeding	Cliff Ledge
Kites, Eagles, Harriers					
Golden Eagle	*Aquila chrysaetos*	Accipitridae	1 – 7	3,000 – 14,000 Year-round	Cliffs and Trees
Accipiters					
Sharp-shinned Hawk	*Accipiter striatus*	Accipitridae	1 – 6	3,000 – 11,500 Year-round	Forest
Cooper's Hawk	*Accipiter cooperii*	Accipitridae	1 – 6	3,000 – 11,500 Year-round	Forest
Buteos					
Red-tailed Hawk	*Buteo jamaicensis*	Accipitridae	1 – 7	3,000 – 13,500 Year-round	Cliff
Falcons, Caracara					
American Kestrel	*Falco tinnunculus*	Falconidae	1 – 7	3,000 – 10,000 Year-round	Cavity
Prairie Falcon	*Falco mexicanus*	Falconidae	1 – 7	3,000 – 14,000 Year-round	Cliff
Sandpipers					
Wilson's Snipe	*Gallinago delicate*	Scolopacidae	1 – 3, 5 – 7	3,000 – 10,500 Winter/ Migration	Ground
Pigeons, Doves					
Rock Dove	*Columba livia*	Columbidae	1 – 7	3,000 – 10,000 Year-round	Artificial Structures
Mourning Dove	*Zenaida macroura*	Columbidae	1 – 7	3,000 – 11,500 Year-round	Shurbs and Trees
Owls					
Great Horned Owl	*Bubo virginianus*	Strigidae	1 – 7	3,000 – 11,500 Year-round	Mature Trees
Goatsuckers					
Common Nighthawk	*Chordeiles minor*	Caprimulgidae	1 – 7	5,500 – 10,000 Breeding	Bare Ground

Swifts					
White-throated Swift	*Aeronautes saxatalis*	Apodidae	1 – 7	5,500 – 10,000 Breeding	Cliff
Hummingbirds					
Black-chinned Hummingbird	*Archilochus alexandri*	Trochilidae	1 – 5, 7	5,500 – 7,000 Rare/ Migration	Trees
Broad-tailed Hummingbird	*Selasphorus platycercus*	Trochilidae	1 – 7	3,000 – 11,500 Breeding	Trees
Rufous Hummingbird	*Selasphorus rufus*	Trochilidae	1 – 6	5,500 – 12,000 Rare	Trees
Woodpeckers					
Northern Flicker	*Colaptes auralus*	Picidae	1 – 7	3,000 – 11,500 Year-round	Cavity
Lewis's Woodpecker	*Melanerpes lewis*	Picidae	1 – 7	3,000 – 8,000 Breeding	Cavity
Downy Woodpecker	*Picides pubescens*	Picidae	1 – 6	3,000 – 11,000 Year-round	Cavity
Hairy Woodpecker	*Picoides villosus*	Picidae	1, 2, 4 – 6	3,000 – 11,500 Year-round	Cavity
Tyrant Flycatchers					
Western Kingbird	*Tyrannus verticalis*	Tyrannidae	1 – 7	3,000 -10,000 Breeding	Trees
Western Wood-Pewee	*Contopus sordidulus*	Tyrannidae	1 – 6	3,000 – 10,000 Breeding	Secondary Cavity
Willow Flycatcher	*Empidonax traillii*	Tyrannidae	1, 2, 4, 5	3,000 – 10,000 Rare/ Breeding	Dense Moist Thickets
Say's Phoebe	*Sayornis saya*	Tyrannidae	1 – 7	3,000 – 9,000 Rare/ Breeding	Platform
Gray Flycatcher	*Empidonax wrightii*	Tyrannidae	2, 4, 5	5,000 – 7,000 Rare	Trees
Cordilleran Flycatcher	*Empidonax occidentalis*	Tyrannidae	1, 2, 4 – 7	3,000 – 11,500 Migration	Variable
Vireos					
Warbling Vireo	*Vireo giluvs*	Vireonidae	1 – 6	3,000 – 10,500 Breeding	Trees or Shrubs

Jays, Crows, Magpies					
Blue Jay	*Cyanocitta cristata*	Corvidae	1, 2, 4, 5, 7	3,000 – 6,000 Year-round	Trees
Western Scrub-Jay	*Aphelocoma californica*	Corvidae	1 – 5	5,000 – 7,000 Year-round/ Rare	Shrubs/ Trees
Steller's Jay	*Cyanocitta stelleri*	Corvidae	1 – 6	5,000 – 12,000 Year-round	Trees
Black-billed Magpie	*Pica pica*	Corvidae	1 – 7	3,000 – 13,000 Year-round	Trees
Common Raven	*Corvus corax*	Corvidae	1 – 7	5,000 – 14,000 Year-round	Trees/ Cliff
American Crow	*Corvus brachyrhynchos*	Corvidae	1 – 7	3,000 – 10,000 Year-round	Trees
Swallows					
Violet-green Swallow	*Tachycineta thalassina*	Hirundinidae	1 – 7	3,000 – 13,000 Breeding	Hollow trees and Rock crevices
Barn Swallow	*Riparia riparia*	Hirundinidae	1 – 7	3,000 – 10,000 Breeding	Mud Nest
Cliff Swallow	*Hirundo pyrrhonota*	Hirundinidae	1 – 7	3,000 – 10,000 Breeding	Mud Nest
Chickadees, Titmice					
Black-capped Chickadee	*Parus atricapilus*	Paridae	1 – 6	3,000 – 9,000 Year-round	Secondary Cavity
Mountain Chickadee	*Parus gambeil*	Paridae	1, 2, 4 – 7	5,000 – 11,500 Year-round	Secondary Cavity
Bushtits					
Bushtit	*Psaltiparus minimus*	Aegitalidae	1 – 7	5,000 – 8,500 Rare	Trees or Shrubs
Nuthatches					
White-breasted Nuthatch	*Sitta carolinensis*	Sittidae	1, 2, 4 – 6	3,000 – 11,500 Year-round	Secondary Cavity
Red-breasted Nuthatch	*Sitta canadensis*	Sittidae	1, 2, 4 – 6	3,000 – 11,500 Winter	Secondary Cavity
Pygmy Nuthatch	*Sitta Pygmaea*	Sittidae	1, 2, 4 – 6	5,500 – 10,000 Year-round	Secondary Cavity
Wrens					
House Wren	*Troglodytes aedon*	Troglodytidae	1 – 7	3,000 – 11,000 Breeding	Cavity
Canyon Wren	*Catherpes mexicanus*	Troglodytidae	1 – 7	5,000 – 8,500 Rare/Year-round	Cliff
Rock Wren	*Salpinctes obsoletus*	Troglodytidae	1 – 7	3,000 – 12,000 Breeding	Rock Crevices

Dipper					
American Dipper	*Cinclus mexicanus*	Cinclidae	1 – 3, 5 – 7	5,000 – 11,500 Year-round	Ground/ Streambank
Kinglets, Old World Warblers, Gnatcatchers, Thrushes					
Blue-gray Gnatcatcher	*Polioptila caerulea*	Sylviidae	1, 2, 4, 5, 7	5,000 – 7,000 Rare/Breeding	Trees or Shrubs
Mountain Bluebird	*Sialia currucoides*	Turdidae	1 – 7	3,000 -13,500 Breeding	Secondary Cavity
Townsend's Solitaire	*Myadesies townsendi*	Turdidae	1 – 7	3,000 – 12,000 Year-round	Trees or Shrubs
American Robin	*Turdus migratorius*	Turdidae	1 – 7	3,000 – 11,500 Year-round	Trees or Shrubs
Golden-crowned Kinglet	*Regulus satrapa*	Regulidae	1, 2, 4, 5	3,000 – 11,500 Winter	Trees
Western Bluebird	*Sialia mexicana*	Turdidae	1 – 6	3,000 – 8,000 Summer	Secondary Cavity
Mockingbirds, Thrashers					
Sage Thrasher	*Oreoscoptes montanus*	Mimidae	1 – 7	3,000 – 14,000 Rare/Migration	Shrubs or Ground
Starlings					
European Starlin	*Sturnus vulgaris*	Sturnidae	1 – 7	Year-round	Secondary Cavity
Wood-Warblers					
Virginia's Warbler	*Vermivora virginiae*	Parulidae	1 – 6	3,000 – 10,000 Breeding	Dense Moist Thickets/ Tangles
Yellow-rumped Warbler	*Dendroica coronata*	Parulidae	1 – 7	3,000 – 11,000 Breedin	Dense Moist Thickets/ Tangles
Yellow Warbler	*Dendroica petechia*	Parulidae	1 – 6	3,000 – 10,000 Breeding	Dense Moist Thickets/ Tangles
MacGillivray's Warbler	*Oporornis toimiel*	Parulidae	1 – 6	3,000 – 11,000 Breeding	Dense Moist Thickets/ Tangles
Wilson's Warbler	*Wilsonia pusilla*	Parulidae	1 – 6	3,000 – 13,500 Breeding	Dense Moist Thickets/ Tangles
Yellow-breasted Chat	*Icteria virens*	Parulidae	1, 2, 4 – 6	3,000 – 8,000 Breeding	Dense Thickets
Orange-crowned Warbler	*Vermivora celata*	Parulidae	1 – 6	3,000 – 9,000 Migration	Ground

Tanagers, Cardinals					
Western Tanager	*Piranga ludoviciana*	Thraupidae	1 – 6	3,000 – 10,500 Breeding	Trees
Black-headed Grosbeak	*Pheucticus melanocephalus*	Cardinalidae	1 – 7	3,000 – 11,500 Breeding	Dense Thickets
Blue Grosbeak	*Guiraca caerulea*	Cardinalidae	1 – 7	3,000 – 9,000 Breeding	Dense Thickets
Lazuli Bunting	*Passerina amoena*	Cardinalidae	1 – 7	3,000 – 9,500 Breeding	Dense Thickets
Sparrows, Towhees, Juncos, Old World Buntings					
Green-tailed Towhee	*Pipilo chlorurus*	Emberizidae	1 – 7	3,000 – 11,500 Migration	Ground or Low Shrubs
Lincoln's Sparrow	*Melospiza lincolnii*	Emberizidae	1 – 6	3,000 – 12,000 Migration	Trees or Shrubs
White-crowned Sparrow	*Zonotrichia leucophrys*	Emberizidae	1 – 7	3,000 – 13,000 Winter/ Migration	Ground or Low Shrubs
Spotted Towhee	*Pipilo erythrophthalmus*	Emberizidae	1 – 6	3,000 – 8,000 Year-round	Ground
Grasshopper Sparrow	*Ammodramus savannarum*	Emberizidae	1 – 4, 6, 7	3,000 – 6,000 Breeding	Ground
Vesper Sparrow	*Poecetes gramineus*	Emberizidae	1 – 7	3,000 – 13,000 Breeding	Ground
Song Sparrow	*Melospiza melodia*	Emberizidae	1 – 7	3,000 -10,500 Year-round	Trees or Shrubs
Lark Sparrow	*Chondestes grammacus*	Emberizidae	1 – 7	3,000 – 9,000 Breeding	Ground
Chipping Sparrow	*Spizella passerina*	Emberizidae	1 – 6	3,000 – 11,000 Breeding	Conifer
Brewer's Sparrow	*Spizella breweri*	Emberizidae	1 – 7	3,000 – 10,000 Breeding	Low in Shrubs
Lark Bunting	*Calamospiza melanocorys*	Emberizidae	1 – 7	3,000 – 9,000 Breeding	Ground/ Sagebrush
Orioles, Meadowlarks, Blackbirds					
Western Meadowlark	*Sturnelia magna*	Emberizidae	1 – 7	3,000 – 12,000 Year-round	Ground
Red-winged Blackbird	*Agelaius phoeniceus*	Emberizidae	1 – 7	3,000 – 10,000 Year-round	Wetland Vegetation
Brown-headed Cowbird	*Molthrus ater*	Emberizidae	1 – 7	3,000 – 12,000 Breeding	Parasite
Common Grackle	*Quiscalus quiscula*	Emberizidae	1 – 6	3,000 -9,500 Breeding	Trees or Shrubs
Bullock's Oriole	*Icterus galbula*	Emberizidae	1 – 5, 7	3,000 – 8,000 Breeding	Mature Tree

Finches, Old World Sparrows					
Pine Siskin	*Carduellis pinus*	Fringillidae	1 – 6	3,000 – 11,500 Year-round	Conifer
American Goldfinch	*Carduelis tristis*	Fringillidae	1 – 6	3,000 – 9,000 Year-round	Trees or Shrubs
Lesser Goldfinch	*Carduelis psaltria*	Fringillidae	1 – 6	5,000 – 8,000 Breeding	Trees or Shrubs
House Finch	*Carpodacus cassinii*	Fringillidae	1 – 7	3,000 – 10,000 Year-round	Trees or Shrubs
House Sparrow	*Passer domesticus*	Passeridae	1 – 7	3,000 – 10,000 Year-round	Secondary Cavity

*Habitat Types: see foot note for Table 1

Avian species of possible occurrence and of concern

Common Name	*Scientific Name*	Family	Habitat Types*	Elevation (ft)/ Range	Nesting Preference
Kites, Hawks, Eagles					
Bald Eagle	*Haliaeetus leucocephalus*	Accipitridae	1 - 6	3,000 – 8,000 Winter	Cliffs and Trees
Buteos					
Swainson's Hawk	*Buteo swainsoni*	Accipitridae	1 - 7	3,000 – 10,000 Breeding	Trees
Rough-legged Hawk	*Bueto lagopus*	Accipitridae	1 - 6	3,000 – 9,500 Winter	Trees
Ferruginous Hawk	*Buteo regalis*	Accipitridae	1 – 7	3,000 – 9,000 Year-round	Trees

*Habitat Types: see foot note for Table 1

Appendix 8
Characterization Abstract for Schryver's (Moss's) elfin

Callophrys mossii schryveri
Schryver's elfin

Taxonomy:
Class: Insecta
Order: Lepidoptera
Family: Lycaenidae
Genus: Callophrys

Taxonomic Comments: Formerly in the genus Incisalia. The mossii complex is separated from the fotis complex due to its preference for stonecrop (*Sedum spp.*) as a hostplant. Subspecies schryveri occurs in Colorado (Ferris and Brown 1981). C. mossii schryveri range is restricted to the Rocky Mountain region. Callophrys mossii schryveri contrasts with species C. mossii in that it is smaller, has a lighter dorsal color in the male; and more contrasting ventral hindwing markings (Scott 1986).

CNHP Rank: G4T3S2S3

Distribution: Global range: The mossii complex is confined to the northwestern portion of the United States and southwestern Canada extending south to central California and to east-central Colorado (Stanford and Opler 1993, Ferris and Brown 1981). State range: Foothills and lower montane canyons between 1828 and 2438m (6000 to 8000 ft) (Ferris and Brown 1981). Known from nine counties in the Colorado Rocky Mountain region (Stanford and Opler 1993): Boulder, Clear Creek, Douglas, El Paso, Fremont, Gilpin, Jefferson, Larimer, and Pueblo.

Statewide distribution of Callophrys mossii schryveri
Source: Stanford and Opler 1993

Habitat Comments: Elevational range is between 1828 and 2438m (6000 to 8000 ft). Occupies suitable habitat in Transition to lower Canadian Zone wooded canyons containing the hostplant (Scott 1986). Canyons with steep rocky slopes, mossy bare summits and ridges, brushy foothill ravines, sagebrush hillsides and flats (Pyle 1981).

Phenology: One brood. Flies from February to June depending on locality (Pyle 1981). It is one of the first non-hibernating butterflies to appear in the spring (Ferris and Brown 1981). Stays close to the hostplant, flying erratically and close to the ground, often in inaccessible areas. Males come to damp earth, perching on low shrubs or ground, females are more reclusive and remain higher up on slopes (Pyle 1981). Adults are local, moving an average of only 50m for males and 52m for females over a lifetime (Scott 1986). Males perch all day on shrubs in gulches and on slopes to await females (Scott 1986).

Larval Hostplant: Stonecrop (*Sedum lanceolatum*).

Known Threats and Management Issues: The greatest current threats are extensive urbanization and alteration of habitat. Noxious exotic plants, recreational development and water development continue to threaten lower foothill canyons (even on public lands). The absence of fire and increased tree density may negatively impact hostplant.