



City of Fort Collins Natural Areas Department  
**Bobcat Ridge Natural Area**  
Management Plan | Update August 2017



*naturally yours*



City of Fort Collins  
Natural Areas Department

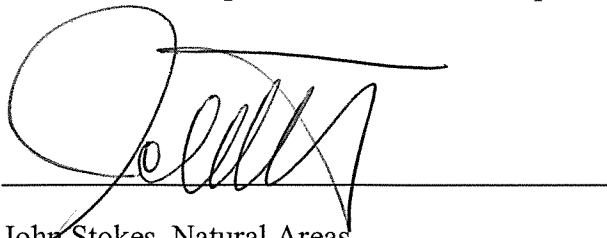
Bobcat Ridge Natural Area  
Management Plan Update 2017

**Natural Areas Mission**

*The mission of the Natural Areas Department is to conserve and enhance lands with natural resource, agricultural, and scenic values, while providing meaningful education and appropriate recreation opportunities.*

**Memorandum of Adoption**

The Bobcat Ridge Natural Area Management Plan Update was administratively adopted by the Natural Areas Department Director on September 15, 2017.



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John Stokes, Natural Areas  
Department Director

8/15/17  
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Date



# Bobcat Ridge Natural Area Management Plan Update 2017

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# Chapter 1. Introduction

## A. Introduction and Scope of the Plan Update

Bobcat Ridge is a well-loved natural area tucked between the red-sandstone hogbacks and rolling hills of Green Ridge just west of Masonville, Colorado. Surrounding land is owned by the US Forest Service, private homes, and ranches. As the City of Fort Collins' first ever regional natural area purchased in 2003, the initial management plan prepared in 2005 outlined management strategies to best steward this new asset for the community. The plan was based on natural resources, cultural history, and regional recreation opportunities as well as public input. Much of the 2005 plan documented habitat and wildlife needs for protection and restoration. The plan also focused on infrastructure that would be necessary to provide access for high-quality visitor experiences while maintaining the site's natural integrity.

Open to the public in the fall of 2006, Bobcat Ridge provides 2,606 acres of wildlife habitat, scenery, and a diversity of wildlife. The natural area now hosts 18.6 miles of trail popular with hikers, mountain bikers, equestrians, and school groups. Visitation has grown; 46,000 vehicles were counted in 2016, which is 53% more vehicle traffic than counted three years prior. In addition to conservation and recreation values, there is interest in Bobcat Ridge's settlement and homestead history.

The 2005 management plan provides a baseline of information about the natural and cultural resources conserved at Bobcat Ridge, and management direction to conserve and steward those resources. This 2017 update plan includes a summary of current resource conditions, actions implemented since 2005, and management direction through 2026. In contrast to the 2005 focus on opening a regional natural area for responsible public enjoyment, this update plan focuses on restoration efforts to conserve the site's biodiversity while addressing the growing interest in visiting and exploring Bobcat Ridge Natural Area.

### *Vision for this management plan update:*

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*Bobcat Ridge Natural Area is conserved for its diversity of plants and wildlife of the foothills ecosystem. It is treasured for its unique recreational opportunities, and connection to the past. Thus, it will be managed to provide high-quality visitor experiences without sacrificing conservation priorities.*

## B. Summary of Public Outreach

Public outreach was conducted to inform and consult citizens and stakeholders on the emerging management topics identified for the next ten years at Bobcat Ridge.

For a month in the fall of 2016, the Natural Areas Department (NAD) solicited feedback on the draft recommended actions via an online questionnaire. On four weekend days in September, staff spoke with visitors at Bobcat Ridge to directly solicit input. On September 26, an open

house at the Harmony Library attracted 30 citizens. Public notification and advertising for these public input opportunities was accomplished via the department’s website, press release, trailhead flyers, the natural areas e-newsletter, social media, direct mailings to neighbors, and e-mails to a stakeholder list. This list included both conservation and recreation interests as well as peer agencies and interested individuals. Over the course of the month, 466 unique feedback forms were collected.

#### Feedback summary

- 85% of the respondents were Larimer County residents.
- 66% of the respondents voluntarily shared their email addresses to be contacted about the management plan final recommendations.
- Crowding
  - When asked how “crowded” the site felt, responses were split between moderately crowded (37%), slightly crowded (34%), and 25% indicating not crowded at all.
- Trails
  - 74% of the respondents were satisfied or very satisfied with separate-use trails.
  - 60% of the respondents requested additional trails in their written comments.
- Parking
  - 76% of the respondents agreed with the recommendation to construct an additional five parking spaces, with only 11% indicating additional parking was unnecessary.
  - Respondents welcomed the implementation of “smart technologies” to check parking availability.

The City Council advisory Land Conservation and Stewardship Board provided input and also reviewed both draft and final recommendations on Oct. 12, 2016, and Feb. 8, 2017. Following the Board’s second review, final recommended management actions were posted on the Natural Areas Department website.



*Elk, Bobcat Ridge Natural Area Photo by Norm Keally*



# Chapter 2. Natural Resource Stewardship

- A. Biodiversity and General Existing Conditions
- B. Physical Resources
- C. Vegetation
- D. Wildlife

## A. Biodiversity and General Existing Conditions

As documented by The Colorado Natural Heritage Program (CNHP), biological diversity is abundant at Bobcat Ridge. CNHP identifies lands with significant biodiversity that warrant conservation and stewardship, which are called Potential Conservation Areas (PCA). Five PCA boundaries intersect with Bobcat Ridge Natural Area.

**Table 2.1: Colorado Natural Heritage Program’s Potential Conservation Areas indicate that biodiversity is significant at Bobcat Ridge**

PCA Name	Associated Element of Biodiversity	Biodiversity Significance Rank
Green Ridge	Rare plant communities	Very high
Bobcat Hogback Ridge	Rare plant, Bell’s twin pod ( <i>Physaria bellii</i> )	Very high
Masonville Hogbacks	Rare Plant communities	Very high
Big Thompson River	Federally threatened Preble’s meadow jumping mouse ( <i>Zapus hudsonius prebleii</i> )	High
Bobcat Ridge Canyons	Rare butterflies	General interest

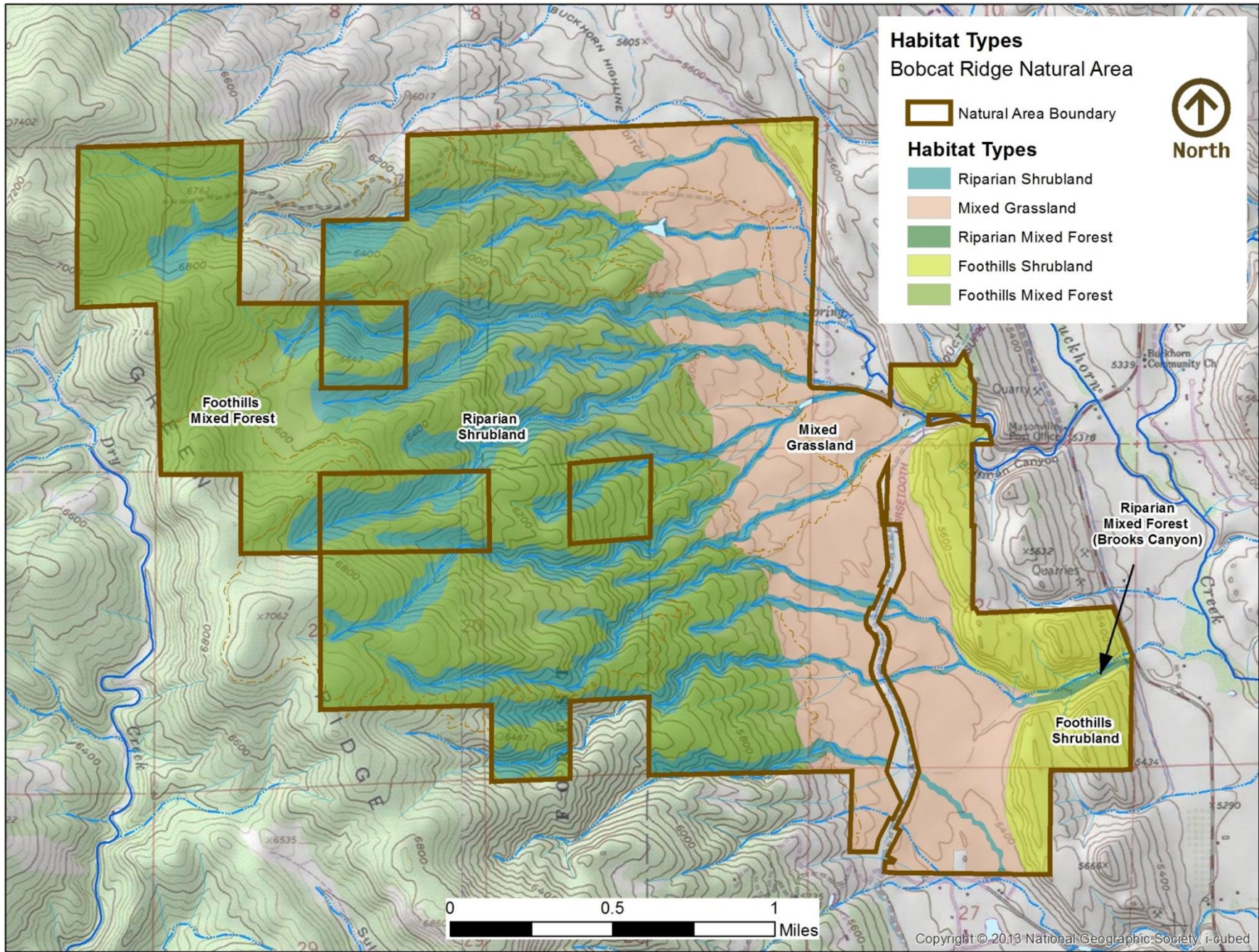
Habitat types based on vegetation communities are depicted in Figure 2.1 and Table 2.2. The map displays the geographic extent of the habitat types present at Bobcat Ridge. Habitat types and descriptions are a Department-wide standard utilized as the basis of proposed restoration or management activities.

One significant change in this updated plan is the addition of the Riparian Shrubland, a significant habitat type that occurs along the steep ravines that cut across the dry hillsides at Bobcat Ridge. Its significance was made evident with the detection of many rare plants and rare butterflies as part of the Bobcat Ridge Canyons PCA. Additionally, one Preble’s meadow jumping mouse (*Zapus hudsonius prebleii*) was documented in 2005 prior to trail construction in one of these ravines.

Another change from the 2005 habitat type designations is the merger of the Ponderosa Pine Woodland and Ponderosa Pine Savanna into a single category designated the Foothills Mixed Forest. The area that burned in the Bobcat Gulch fire in 2000 had been a thick stand of trees representative of a Foothills Forest prior to the severe fire. Currently, this area is devoid of trees, but the desired future habitat for the entire hillside at Bobcat Ridge is a patchier, savanna-like system of widely spaced ponderosa pine trees with foothill shrubs and grassland mosaic understory. A more open canopy structure will also be less prone to high-severity wildfires and is preferable to some wildlife.

**Table 2.2: Natural Areas Habitat Types at Bobcat Ridge (West to East)**

Natural Areas Habitat Type	CNHP/2005 plan term	Definitions
Foothills Mixed Forest	Ponderosa Pine Woodland	This ecosystem consists of widely spaced ponderosa pine with mixed grass patches and/or shrublands (foothills or riparian). The species that dominate this area are generally more xeric than the species that occur in the riparian ecosystems. Trees and shrubs are of equal importance in this area.
	Ponderosa Pine Savanna	
Riparian Shrubland	Formally within the Ponderosa Pine Woodland and Savanna	Shrub species dominate this area. The shrub species that inhabit these areas require access to water, whether occurring adjacent to waterways or occupying canyons, gulches or seeps where water accumulates. Riparian trees may occupy the same area, but are not dominant. Often occur with patches of grassland and/or wetland areas (cattail or emergent). Woody vines may also be present.
Mixed Grass	Foothills Grassland	This area is made up of elements from both tall and shortgrass prairies, with neither dominating. Mixed grass species usually include western wheatgrass and little bluestem as dominants. Some widely spaced shrublands may occur in the area or on top of hills, but are not dominant. Forbs are present and may even equal up to 40% of the area.
Foothills Shrubland	Lower Montane-Foothills Shrubland	This area consists of deciduous and/or evergreen shrubs with patches of mixed grasses and/or forbs in the understory. The species that dominate this area are generally more xeric than the species that occur in the Riparian Shrubland. These shrubs usually occupy dry, rocky slopes and hilltops.
Riparian Mixed Forest	Lower Montane Riparian Woodland	The species that inhabit these areas require better access to water, whether occurring adjacent to waterways or occupying canyons, gulches or seeps where water accumulates. Riparian trees and shrubs are of equal importance. Often occur with patches of grassland and/or wetland areas (cattail or emergent).



**Figure 2.1: Map of Habitat Types**

The Natural Areas Department compiled a list of plant and wildlife “Species of Interest” for the Fort Collins area as part of the NAD *Restoration Plan*. The plants and wildlife on this list are ones that are documented or have the potential to occur on natural areas and are:

- 1) Tracked by the Colorado Natural Heritage Program;
- 2) Plants that are uncommon in Colorado and/or Larimer County;
- 3) Plants that were once common in the Shortgrass Prairie or Foothills Shrublands that are threatened by development along the Front Range; and/or
- 4) Wildlife species considered of greatest conservation need in the 2015 *State Wildlife Action Plan* (SWAP) by Colorado Parks and Wildlife.

Rare plant surveys conducted since the 2005 management plan have found an additional 11 plants that are all on the Natural Area Department’s Species of Interest List (Table 2.3). Bobcat Ridge is the only natural area in which some of these plants have been recorded. An updated species list of all plants documented at Bobcat Ridge is in Appendix A.

**Table 2.3: Plants on the NAD Species of Interest List documented at Bobcat Ridge Natural Area**

Common Name	Scientific Name	Habitat/Notes	CNHP State Ranking
<b>RIPARIAN SHRUBLAND</b>			
Two headed water-starwort	<i>Callitriche heterophylla</i>	In slow moving streams	Critically imperiled
Sprengel’s sedge	<i>Carex sprengelii</i>	Along streams	Imperiled
Flodman’s sedge	<i>Cirsium flodmanii</i>	Along streams and in wet meadows	Not yet ranked
Great Plains flatsedge	<i>Cyperus lupulinus</i>	On rocky slopes in canyons	Not yet ranked
Bearded flatsedge	<i>Cyperus squarrosus</i>	Along streams and drying margins	Not yet ranked
Wild hops	<i>Humulus lupulus</i> var. <i>neomexicanus</i>	In cool, moist canyons	Not yet ranked
Smallflower halfchaff sedge	<i>Lipocarpha aristulata</i>	Along streams and drying margins <i>Only population documented in Larimer County since 1893</i>	Not yet ranked
<b>FOOTHILLS MIXED FOREST/ FOOTHILLS SHRUBLAND</b>			
Forked spleenwort	<i>Asplenium septentrionale</i>	In rocky crevices	Vulnerable/apparently secure
Jeweled blazingstar	<i>Mentzelia speciosa</i>	On dry, rocky or sandy soils	Vulnerable
Bell’s twinpod	<i>Physaria bellii</i>	On shale or limestone slopes <i>Unique that is it found on red sandstone at Bobcat Ridge</i>	Imperiled/vulnerable
Clasping Venus’ looking-glass	<i>Triodanis perfoliata</i>	On dry, rocky or sandy soils	Not yet ranked

Currently the natural area’s 2,606 acres exhibit a range of 25-75% native vegetation cover, which is considered fair to good condition (see NAD *Restoration Plan*), and is common for foothill natural areas in this region. The vegetation composition on the hillsides is comprised of native

trees and shrubs that are the base structure of foothill plant communities such as ponderosa pine (*Pinus ponderosa*), and mountain mahogany (*Cercocarpus montanus*). While there is a long list of native grasses and forbs at Bobcat Ridge, the understory plants of foothill plant communities in this region typically compete with the predominance of cheatgrass (*Bromus tectorum*). The prevalence of cheatgrass is a management concern especially when it occurs within a high concentration of imperiled and vulnerable plant communities, threatening the diversity of Bobcat Ridge.

It follows that the many habitats at Bobcat Ridge support a diversity of wildlife. Bobcat Ridge provides habitat for 35 species of wildlife that are in need of conservation and are on the NAD Species of Interest List (Table 2.4). A full list of wildlife documented at Bobcat Ridge is in Appendix B. This management plan update outlines ambitious goals to further their conservation through appropriate stewardship and restoration.

**Table 2.4: Wildlife on the NAD Species of Interest List documented at Bobcat Ridge Natural Area**

<b>Birds</b>	
Brewer's sparrow	<i>Spizella breweri</i>
Burrowing owl	<i>Athene cunicularia</i>
Cassin's finch	<i>Peucaea cassinii</i>
Ferruginous hawk	<i>Buteo regalis</i>
Golden eagle	<i>Aquila chrysaetos</i>
Grasshopper sparrow	<i>Ammodramus savannarum</i>
Lark bunting	<i>Calamospiza melanocorys</i>
Lazuli bunting	<i>Passerina amoena</i>
Lewis's woodpecker	<i>Melanerpes lewis</i>
Loggerhead shrike	<i>Lanius ludovicianus</i>
Northern goshawk	<i>Accipiter gentilis</i>
Northern harrier	<i>Circus cyaneus</i>
Northern pygmy-owl	<i>Glaucidium gnoma</i>
Pinyon jay	<i>Gymnorhinus cyanocephalus</i>
Prairie falcon	<i>Falco mexicanus</i>
Rufous hummingbird	<i>Selasphorus rufus</i>
Swainson's hawk	<i>Buteo swainsoni</i>
Virginia's warbler	<i>Oreothlypis virginiae</i>
Willow flycatcher	<i>Empidonax traillii</i>
<b>Mammals</b>	
Abert's squirrel	<i>Sciurus aberti</i>
Bighorn sheep	<i>Ovis canadensis</i>
Black-tailed prairie dog	<i>Cynomys ludovicianus</i>
Hoary bat	<i>Lasiurus cinereus</i>
Preble's meadow jumping mouse	<i>Zapus hudsonius preblei</i>
Townsend's big-eared bat	<i>Corynorhinus townsendii</i>
<b>Butterflies &amp; Moths</b>	
Moss's elfin	<i>Callophrys mossi schryveri</i>

## **B. Physical Resources**

### **1. Update on Actions Taken and Current Conditions**

The 2005 management plan examined geology, soils, hydrologic, and scenic resources; the implemented actions identified are summarized below.

#### **Geological Resources**

Rock climbing was not allowed due to the occurrence of rare plants and potential raptor-nesting habitat on the hogbacks. No other suitable rock climbing areas were found at Bobcat Ridge.

Rock climbing will continue to be prohibited.

#### **Soils**

The prevention of soil erosion was a priority in the first plan due to concerns associated with past grazing practices, past fires, and planned trail construction. During the past ten years, the department has developed grazing plans that consider soil erosion prevention as part of best management practices. Grazing leases now restrict cattle from entry into drainages where erosion and trampling of riparian vegetation is of concern. Likewise, best management practices were implemented to prevent erosion during trail and infrastructure construction.

#### **Hydrologic Resources**

Stock tanks from the grazing operations prior to the site's acquisition were removed per the plan. Two small ponds created by earthen dams were left in place as they provide wildlife access to water in an otherwise dry foothill environment. While these ponds often dry up in the late summer, the exposed "mud flat" is an important habitat feature for butterflies and other pollinators (Boggs and Birgitt, 2004). The streams that cut downslope through Bobcat Ridge add significant habitat value and greatly contribute to Bobcat Ridge's biodiversity. Future management of the Riparian Shrubland habitat formed in these drainages will focus on weed control to help restore and improve the habitat value.

#### **Scenic Resources**

Conservation of the scenic vistas at Bobcat Ridge was accomplished through careful trail and parking lot design, as directed in the first management plan. Conserving more land and burying the powerline remain long-term strategies to preserve the natural area's scenery.

Recently, a Night Sky monitoring program was initiated. Results indicate that Bobcat Ridge is moderately affected by nighttime lighting, yet scores fairly well for being less than 10 miles from the city center of Fort Collins. The hogback ridge blocks light from Masonville, Fort Collins and Loveland and provides wonderful opportunities to view the cosmos. Public education programs using this dark sky resource are regularly hosted by Northern Colorado Astronomical Society and the Natural Areas Department.

### **2. Recommended 10-year Actions for Physical Resources**

Future management will continue to emphasize soil conservation and protection of geological features. They form the fundamental basis for the wonderful diversity found at Bobcat Ridge. Grazing operations will continue to focus on vegetation management and restoration goals.

Restoration efforts of the Riparian Shrubland habitat will require an enhanced understanding of local hydrology. Conservation of scenic views through future land conservation will continue to be a priority as opportunities arise. Night sky monitoring will also continue.

## C. Vegetation

### 1. Update on Actions Taken and Current Conditions

Vegetation management actions in the 2005 plan that apply broadly to all habitat types in the natural area generally entailed implementation of the Natural Areas Department's standard vegetation management practices. Weed control conducted over the last ten years (mostly via herbicide) targeted problematic Canada thistle (*Cirsium arvense*), musk thistle (*Carduus nutans*), Dalmatian toadflax (*Linaria dalmatica*), and cheatgrass (*Bromus tectorum*). The cattle grazing operation that covered the entire site year-round, ceased in 2006. A new grazing program initiated in 2016 and managed by NAD has the goal of contributing to the restoration in the valley grasslands. Sensitive habitats such as the hogbacks and riparian areas are closed to the public per the guidance of the original management plan.

Many monitoring actions listed in the first plan were intended to capitalize learning opportunities related to small burn areas and effective methods to quickly reestablish native vegetation and eliminate cheatgrass. Actions for the future incorporate this gained knowledge and continue with adaptive management practices.

The original management plan also identified a restoration plan to be developed specifically for Bobcat Ridge. Instead, The Natural Areas Department's 2016 *Restoration Plan* addresses all natural areas and includes a focus on restoration efforts at Bobcat Ridge. The efforts will focus on the Mixed Grass, Foothills Mixed Forest, and Riparian Shrubland habitats.

#### **Foothills Mixed Forest**

The management direction in 2005 was to monitor natural regeneration of the ponderosa pine (*Pinus ponderosa*) within the area burned during the Bobcat Gulch fire in 2000. Other recommended actions included use of prescribed fire to begin restoration and to reduce the fuel load of downed timber, as well as to study and continually improve management practices associated with prescribed and wild fire.

Significant natural regeneration of ponderosa pine within the severely burned area has not been observed. This is likely due to the severity of the Bobcat Gulch fire in 2000, which killed the seedbank and nearby seed sources. Proximity to existing seed-source trees has been found to be the most significant factor for natural regeneration of ponderosa pine trees (Chambers et al., 2016). Ponderosa pine seeds have been found to disperse 40-80 meters (two tree heights) from parent/mature pine trees. The severely burned area of Bobcat Ridge spans more than 1,500 – 2,000 meters from existing trees and hence could take many decades, if not longer, to reestablish naturally. Supplemental tree plantings are recommended if a forested condition is the desired habitat type (Chambers et al., 2016). A Foothills Mixed Forest habitat with an open canopy and a patchy mix of trees, shrubs, and grass/forb understory is an ideal objective to help moderate future fire behavior and maintain a resilient ponderosa pine forest.



*Mixed Foothills Forest at Bobcat Ridge Natural Area*

The Natural Areas Department has conducted three prescribed burns (totaling 99 acres), and 150 slash-piles burned since the original management plan. The goal of the prescribed burns was weed control and biomass removal in preparation for conversion to native grasses and forbs. About 50 acres were cleared of downed timber through the slash-pile burning. Several slash piles were left intact for wildlife use.

The 2005 management plan also identified a need for a prescribed fire plan for Bobcat Ridge. Instead, in 2012 a *Fire Management Plan* for all natural areas, including Bobcat Ridge was completed. The goal for prescribed burning at Bobcat Ridge is to remove biomass to prepare the ground for restoration. Challenges to prescribed burns at Bobcat Ridge include steep terrain, lack of firebreaks, and prevalence of cheatgrass which is considered a “flashy fuel” that is very susceptible to wildfire, hence increasing hazardous conditions of a prescribed burn.

There have been four wildfires since 2009, burning a total 225 acres at Bobcat Ridge. Three of those fires happened in the past two years (2015-2016) with several more in nearby foothill areas. In June 2016, a single dry lightning storm started three separate fires at Bobcat Ridge, Horsetooth Mountain Open Space, and at Lory State Park. This is indicative of a typical fire cycle in low elevation ponderosa pine communities that host expansive areas of cheatgrass. After a year or two of higher precipitation (often associated with El Nino years), there is an increase of fine fuels due to the increased vegetation growth of wetter years. As drier conditions return, the dried out fine fuels are readily combustible leading to an increase in wildfires (Veblen et al., 2012). Cheatgrass forms a thick mat of fine fuels, cures earlier in the season than most grasses, and continues to be susceptible to fire longer into the fall.



The Natural Areas Department is attempting to reduce cheatgrass cover at Bobcat Ridge through aerial herbicide treatment. This helicopter-based application is a new method for the Department to implement treatments at the larger-scale required and in difficult terrain in the foothills setting. In 2016, 160 acres of cheatgrass was treated via aerial application at Bobcat Ridge. The effectiveness of this treatment will be evaluated in 2017 and expanded pending a successful outcome. The Department will continue in the future with the goal of converting vegetation to a more diverse spectrum of native grasses and forbs as well as reducing a significant factor in wildfire.

Lastly, the 2005 management plan directed the Department toward gaining a better understanding of the role of fire, specifically historic forest structure, fire regimes, and utilization by cavity nesting birds. Studies of these topics have occurred by external researchers as well as surveys conducted for the Natural Areas Department. New knowledge and understanding continue to guide management decisions the department makes.

### **Riparian Shrubland**

Rare plant surveys since 2005 had notable findings in the Riparian Shrubland habitat, thus it is delineated as a separate habitat type in this update plan. Rare plant surveys found six of nine newly found rare plants in ravines. Most of these species prefer the wet areas of the ravines (see Table 2.3), suggesting these drainages may support permanent surface or sub surface water. In the dry foothill habitats, these drainages provide a critical habitat component for most wildlife. Prior to trail construction in 2005, a survey documented one Preble's meadow jumping mouse in one of the northern Riparian Shrubland ravines. Similarly, a rare butterfly, the Moss's elfin (*Callophrys mossi schryveri*), and its larval host plant were also documented in the steep ravines. Bird surveys suggest that these riparian ribbons provide a more complex vegetative structure that attracts a variety of birds such as warbling vireo (*Vireo gilvus*), yellow-breasted chats (*Icteria virens*), towhees (*Pipilo sp.*), and several warbler species. Stock tanks that were filled by natural springs in the drainages were removed. Future management actions propose improving habitat conditions through weed control.

### **Foothills Shrubland (Hogback Ridge)**

The Foothills Shrubland habitat hosts populations of the rare Bell's twin-pod (*Physaria bellii*) plant. Bell's twin-pod is locally endemic and occurs only in Larimer and Boulder counties in Colorado and nowhere else in the world. The Bobcat Ridge population is unique because it grows on the red sandstone Fountain/Ingleside formation rather than its usual habitat, the Niobrara outcrop. Bobcat Ridge is home to 12% of the total Bell's twin-pod population found on Natural Areas. Because of this contribution to Bell's twin-pod overall population, future management actions will be centered on conservation, monitoring, and protection of the habitat occupied by Bell's twin-pod. This will include continuing to restrict public access and exclude these areas from cattle grazing.

Bell's twin-pod monitoring is done on a five-year interval. Comparison of the first year (2007) monitoring with repeat measurements made in 2012 revealed a 95% decline in living individuals. While this number appears drastic, knowledge of the plant community's life cycle and population dynamic suggest highs and lows may be typical for this plant. Informal observations of this plant in non-survey years (2013, 2015, and 2016) saw an increase in seedling germination

and an abundance of flowering individuals. Continued monitoring is clearly warranted to further improve understanding of the species' dynamics.

Known threats include development, plant competition, climate change, and soil compaction. The 2005 management plan actions to conserve the plant were to remove grazing in this area and manage cheatgrass encroachment into the Bell's twin-pod population. Grazing was removed and cheatgrass has not yet been a problem for the Bobcat Ridge population, but will continue to be monitored.

### **Mixed Grass**

In the 2005 management plan, actions specific to valley grasslands centered on discontinuing the haying lease, targeted weed control, and ecological restoration of the grasslands. One exception to that management direction was the alfalfa field where a rare occurrence of grasshopper sparrows (*Ammodramus savannarum*) existed. To accommodate the fledging and foraging needs of grasshopper sparrows, alfalfa cutting was delayed until mid- July. Delayed mowing is now a routine management practice in all natural areas with ground nesting birds. Haying continues in the valley area east of the Hanson Feeder Canal on an annual lease basis. Converting the non-native grass fields to native habitat will begin in 2017 and when necessary, haying operations will be ceased to accommodate restoration activities. Two exotic grasses, smooth brome (*Bromus inermis*) and crested wheatgrass (*Agropyron cristatum*) dominate the majority of the Mixed Grass habitat in the valley at Bobcat Ridge. These grasses form a monoculture that inhibits native plant establishment. Remnant native grassland patches will continue be used as reference plant communities during restoration efforts.

One restoration effort began on 48 acres of grasslands in 2010 with a prescribed burn. The goals of the restoration were to establish a native, Mixed Grass habitat including specific habitat needs for existing butterfly species. Following the prescribed burn, exotic grasses were treated via mowing and herbicide application. Native grass seed mixes were planted in the subsequent two years. While native forbs have established in the restoration area, the restoration is not complete. Native plant cover is only at 30-35% and exotic grasses continue to be present in the area.

Previous land uses in the valley at Bobcat Ridge included haying and grazing. After purchase, the grazing lease was discontinued in 2006, though haying continues today. For a decade, cattle grazing was absent to rest the land. In 2015, a prescriptive grazing program was piloted as one of several methods to assist in the transition of the agricultural fields to native grassland. There are approximately 570 acres included in the grazing lease, which are divided into multiple pastures rotationally grazed. The goals include increasing forb abundance and diversity, promoting habitat heterogeneity, increasing native grasses, supporting bird diversity, and controlling noxious weeds. Figure 4.1 in Chapter 4 shows the grazing lease areas as of 2016.

The current grazing plan is evaluated seasonally and is adjusted as needed to meet specific goals related to restoration. The grazing plan specifies avoiding trails, muddy conditions, and vehicle use in alignment with the Natural Areas Department's stewardship mission. Cattle are fenced-in with a transportable wire fence so very specific areas can be "flash-grazed." While drainages and riparian areas are generally avoided, they may be flash-grazed on occasion. Due to the potential for disease spreading to existing bighorn sheep, grazing with domestic sheep and goats will not allowed at Bobcat Ridge.

## 2. Recommended 10-year Actions for Vegetation

The Natural Areas Department *Restoration Plan* (2016) outlines vegetation management and ecological restoration goals at Bobcat Ridge. The goals include desired future vegetation communities that include a diversity of plant species and plant community structure to support Bobcat Ridge's native wildlife. A variety of bird and butterfly species have been selected to serve as faunal indicators of improved habitat and restoration progress. Given the occurrences of rare plants, butterflies, and the Preble's meadow jumping mouse, goals and actions are designed to maintain and enhance these important species and populations. Management practices that mimic or include natural ecological processes (such as fire and grazing) will continue to support restoration as well as maintaining existing quality native habitat conditions.

Restoration activities in the next ten years will:

1. Accelerate grassland restoration of the Mixed Grassland habitat within the valley,
2. Plant ponderosa pine in the severely burned areas of the Foothills Mixed Forest,
3. Improve habitat conditions through extensive weed control and additional planting in the Riparian Shrubland habitat to support and enhance rare plant communities and increase suitability for the Preble's meadow jumping mouse,
4. Time and conduct vegetation management actions such as mowing, cattle grazing, or prescribed burning, to benefit pollinators and nesting songbirds.

### **Mixed Grassland Habitat**

- Restoration of the Mixed Grassland in the valley will commence in 2017 with the goal of completing approximately 600 acres of grassland treatment by 2025.
- Species to include are:
  - Native tall-grasses such as blue gramma (*Bouteloua gracilis*), needle and thread (*Hesperostipa comata*), Indian rice grass (*Oryzopsis hymenoides*), and *Aristidas* spp. to attract grassland and foothill birds of interest that already occur such as grasshopper sparrow (*Ammodramus savannarum*), brewer's sparrow (*Spizella breweri*), and lazuli bunting (*Passerina amoena*),
  - Butterfly larval host plants and adult nectar plants such as big bluestem (*Andropogon gerardii*), little bluestem (*Schizachyrium scoparium*), and a diversity of native forbs (see Appendix C), and
  - Blue, yellow, and white forbs for other pollinator species.
- A combination of vegetation management strategies including fire, grazing, herbicide application, and supplemental planting will be utilized to convert the non-native grass fields to a diverse structure and mix of native forbs and grasses.
- Continue to evaluate the utility of cattle grazing to improve grassland conditions including native species abundance and diversity, and decrease of non-native grasses and forbs.

### **Foothills Mixed Forest**

- Continue supplemental ponderosa pine sapling plantings to determine the viability of a reforestation effort.

- Continue to watch health of the small remaining ponderosa pine population for impacts from pine beetles, disease, and other stressors and determine appropriate management actions to conserve this habitat.
- Leave all standing dead trees in place for cavity nesting bird species (bluebirds, owls, and woodpeckers).
- Continue aerial herbicide treatment of cheatgrass on an annual basis while consistently evaluating treatment success.

### **Riparian Shrubland Habitat**

- Weed control and restoration in the Riparian Shrubland will support habitat needs of rare plants, butterflies and Preble’s meadow jumping mouse. This will include best management practices to avoid impacts to local mouse populations.
- Riparian vegetation will be managed for, and in consideration of, Preble’s meadow jumping mouse reintroduction.

### **Foothills Shrubland**

- Continue to monitor and understand population trends of Bell’s twin-pod. Implement management actions necessary to protect existing populations from sources of stress.

### **Across All or Multiple Habitat Types**

- Use findings from bird and butterfly surveys to guide restoration and management actions including targeted species lists for seeding and planting projects.
- Restoration priorities for augmentation, reintroduction, and/or ex situ conservation are: wild hops (*Humulus lupulus* var. *neomexicanus*), Bell’s twin-pod, and clasping Venus’ looking-glass (*Triodanis perfoliata*).

## **D. Wildlife**

### **1. Update on Actions Taken and Current Conditions**

The general objective for all wildlife at Bobcat Ridge in the 2005 plan and continuing forward is to protect, enhance, or restore habitats for both existing and expected wildlife. The 2005 plan recognized Bobcat Ridge as important wintering ground for elk, mule deer, and wild turkey. In recent years, the elk herd has grown to a point where adverse habitat impacts may be occurring and proactive management actions are being considered.

#### **Elk, Deer & Bighorn Sheep**

Bobcat Ridge is home to a migratory herd of an estimated 400-600 elk (*Cervus Canedensis*) in the winter (November-March) and a summer herd of approximately 60 elk. There is concern that a resident elk herd is forming, which could lead to resource damage and habitat impacts for multiple species.

A resident herd forms when pressures created by predators and hunting are absent, or when weather tends to favor one elevational habitat over another. These combined factors may encourage herds to remain on a site with loss of migratory behavior. This often leads to

overgrazing and over-browsing which results in habitat degradation at the expense of other wildlife. It can also lead to the creation of game trails that can become permanent when visitors begin to use them. Once established, a resident elk herd is difficult to manage and control. Boulder County Parks and Open Space is grappling with a resident herd at Rabbit Mountain Open Space that grew to over 250 elk over the course of five years and is now estimated at 600 elk. As with the Boulder County example, excessive numbers of non-migratory elk may degrade habitat quality, as well as strain surrounding farm and ranchland by damaging crops, fencing and adjacent neighbor relations.



*Elk, Bobcat Ridge Natural Area*

Colorado Parks and Wildlife (CPW) and the Natural Areas Department are collaborating to monitor both elk populations and the condition of indicator vegetation to establish a baseline in advance of possible management actions. Several elk from the Bobcat Ridge herd have been fitted with data-tracking collars to help understand elk movement patterns. Vegetation monitoring for elk damage will be implemented in 2018. This data will help inform a discussion as to whether or not a controlled, limited hunt will be necessary. Additional recommendations can be found in the Recommended 10-year Actions section of this chapter.

The 2005 plan identified a need to reduce movement barriers within the natural area. When the grazing lease terminated in 2006, all pasture fencing was removed. The new cattle-grazing lease utilizes temporary fencing to lessen the impact on wildlife movement. The Northern Water Conservancy District added elk-friendly fencing at their Hansen Feeder Canal crossing as the elk venture east of the canal daily in the winter. To enhance habitat for elk, the plan also identified the opportunity to create grassland meadows within the burn areas. Downed trees were collected, piled, and burned to help create grassy meadows while serving the dual purpose to reduce heavy fuel load for subsequent wildfires. Seasonal closures to protect elk during mating and calving season have not yet been necessary.

Chronic Wasting Disease (CWD) is a concern for elk and mule deer (*Odocoileus hemionus*) and is monitored by Colorado Parks and Wildlife. While it appears that CWD-infected animals have not turned up at Bobcat Ridge over the past ten years, the highest prevalence rate of CWD in mule deer is within CPW's game management unit in which Bobcat Ridge is located. The Natural Areas Department will continue to assist CPW with monitoring deer and elk populations for disease.

Bighorn sheep (*Ovis canadensis*) are another large-game species that will visit Bobcat Ridge on occasion. As bighorn sheep are susceptible to bacterial diseases and parasites, CPW has requested that grazing or weed control with domestic sheep or goats be prohibited. In addition, CPW asks that any sightings of bighorn sheep at Bobcat Ridge be reported.

Prairie dogs (*Cynomys ludovicianus*)

Bobcat Ridge Natural Area hosts two prairie dog colonies located in the Mixed Grass habitat within the valley. Prairie dog populations at Bobcat Ridge are managed consistently with the Department's *Wildlife Conservation Guidelines* (2017) as part of a system-wide approach.

In 2015, sylvatic plague greatly reduced prairie dog numbers in colonies across Bobcat Ridge. It is expected that prairie dogs will recolonize and likely reach pre-plague levels within several years. The Natural Areas Department has used lethal management at Bobcat Ridge as a method to balance the heavy grazing pressure exerted by prairie dogs and protect sensitive areas such as rare plants or restoration areas, and maintain buffers to private residences.

Preble's meadow jumping mouse (*Zapus hudsonius preblei*)

Since the 2005 management plan, a series of surveys were conducted to determine suitable habitat areas that could warrant further presence/absence surveys of Preble's meadow jumping mouse (PMJM). The multiple drainages within Bobcat Ridge are considered potential habitat for the jumping mouse given the presence of thick riparian vegetation, and adjacent upland grasslands within the mouse's known elevational range. The northern part of Bobcat Ridge is within the Big Thompson Priority Conservation Area, which is designated for Preble's meadow jumping mouse. In addition, there are two previously documented mouse capture sites within 2.5 miles.



*Preble's meadow jumping mouse* photo by USFWS

Habitat suitability surveys in 2005 found one of the three locations surveyed to be suitable habitat. Noteworthy comments on the two unsuitable habitats were the impacts of heavy grazing, crop production, and lack of hydrologic connectivity to the previously found mice. The third location on the north side of Bobcat Ridge had better quality vegetation and greater potential for

hydrologic connectivity to a previously documented mouse capture site. A mouse was captured in 1998 in the Little Bear Gulch, 2.5 miles away. Potential connectivity appears to be possible through Little Bear Gulch to Buckhorn Creek and the Buckhorn Highline Ditch, which intersects this northern drainage. (Peterson, 2005)

A proposed trail was planned to go through a portion of the suitable habitat area. In June 2005, prior to trail construction, a presence/absence trapping survey was conducted resulting in one Preble's meadow jumping mouse captured. After consulting with the US Fish and Wildlife Services (USFWS), the trail was re-routed to avoid all suitable habitats. All construction related activities were timed with the mouse's dormant season. Footbridges were used instead of culverts for the stream crossings to reduce impacts to the Preble's meadow jumping mouse habitat.

In 2015, the same site was revisited to assess the presence of the mouse ten years following the first detection. Unfortunately, the previous capture site was dry, devoid of riparian vegetation, and showed little potential as suitable mouse habitat. Another site nearby, the detention pond edge and the downstream drainage had better potential, yet was still marginal as suitable habitat. This site was surveyed, however, no mice were found. While this site had many habitat requirements for the mouse, it was not in prime condition and contained many weedy plants (Schorr, 2015). While PMJM habitat appears to be degraded at Bobcat Ridge, there are documented occurrences both on-site and nearby, which warrant further surveys and a strong focus on Riparian Shrubland habitat restoration.



*Bears at Bobcat Ridge Natural Area, photo by Karl Manderbach*

### *Carnivores*

The 2005 plan identified the need proactively reach out to visitors about the habits of and precautions to avoid conflicts with mountain lions and black bears. The citizen-science wildlife camera project initiated by the Rocky Mountain Cat Conservancy (RMCC) has been a valuable

outreach and educational tool that helps visitors understand both the frequency and timing of lion and bear visits to Bobcat Ridge. The Natural Areas Department posts highlights monthly here: <http://www.fcgov.com/naturalareas/wildlife-camera.php>

### Bats

At the time the first plan was written, only Townsend's big-eared bat (*Corynorhinus townsendii*), a Natural Areas Department Species of Interest, had been documented at Bobcat Ridge. Additional surveys were conducted in 2005 and evidence of reproduction was found (Neubaum et al., 2007). Species captured in this effort, from most to least common, include

- big brown bats (*Eptesicus fuscus*)
- western small-footed myotis (*Myotis ciliolabrum*)
- silver-haired bats (*Lasionycteris noctivagans*)
- little brown bats (*Myotis lucifugus*)
- hoary bats (*Lasiurus cinereus*) \*
- western long-eared myotis (*Myotis evotis*)
- long-legged myotis (*Myotis volans*)

\*NAD Species of Interest

Evidence of reproduction in females was found in three of these species; the silver-haired bat, long-eared myotis, and western small-footed myotis. The fringe-tailed myotis (*Myotis thysanodes*) is a NAD Species of Interest that has the potential to occur at Bobcat Ridge. The Townsend's big-eared bat, which had been previously documented, was not detected during the 2005 surveys. A new bat survey is scheduled for 2017 at Bobcat Ridge that will serve as a follow-up to the earlier survey. One objective of the survey will be to determine if additional protection or restoration measures can be made to enhance habitat for the bats using Bobcat Ridge.

### Birds

A significant diversity of birds has been documented, with 157 different species at Bobcat Ridge (Full list in Appendix B). In order to conserve and enhance habitat for birds, the 2005 plan outlined actions including: establishing buffers and seasonal closures for sensitive species, conducting breeding bird surveys, managing the burned area for cavity nesters, and restoring the variety of habitat types. The Natural Areas Department typically closes sensitive areas as needed for nesting raptors, using CPW recommended buffers. At Bobcat Ridge, golden eagles (*Aquila chrysaetos*) had a nest site on the hogback cliffs above the cabin in the northeast end of the natural area. The trail to the cabin was temporarily closed during the breeding season in 2008 and 2009; however, the nest site has since been abandoned. The Bird Conservancy of the Rockies conducted bird surveys in 2015 and 2016. This data will be used as a reference to assess



Yellow Warbler, photo by Aran Meyer



restoration efforts in the grassland valley and throughout the natural area. While the majority of dead trees have fallen in the burned area, several standing trees have proven to house cavity nesters. The recent bird surveys found Lewis's woodpecker (*Melanerpes lewis*) and mountain bluebird (*Sialia currucoides*) using standing dead trees for nesting cavities. Both of these species are of high conservation concern in this region (Youngberg, 2017).

The 2015 and 2016 data provide a baseline prior to restoration efforts, which include accelerated control of cheatgrass, efforts to convert smooth brome fields to native grasses, and pine planting. Future surveys will continue to reveal trends in populations and species diversity. Populations of several obligate shrubland species appear relatively stable (spotted towhee (*Pipilo erythrophthalmus*), lazuli bunting (*Passerina amoena*), blue-grey gnatcatcher (*Poliophtila caerulea*) and lark sparrow (*Chondestes grammacus*). The Riparian Shrubland habitat provides mesic plant communities within the otherwise drier, more arid foothills landscape. Species utilizing these areas include warbling vireo (*Vireo gilvus*), yellow-breasted chats (*Icteria virens*), towhees (*Pipilo sp.*) and several species of warblers. As expected, very few bird observations were made in smooth brome fields providing additional evidence of the lack of habitat present within the grass monoculture. Much of the valley at Bobcat Ridge is scheduled to undergo major grassland restoration for a five-year period beginning in 2017.

Finally, exciting and rare sightings of the American woodcock (*Scolopax minor*), were a regular January event 2015-2017 attracting hundreds of visitors. Many avid bird watchers from out of state made the trip to Bobcat Ridge to get a glimpse of this bird more commonly found in the eastern states. At times, the Bobcat Ridge resident ranger was inundated with visitors. The ranger went out of his way to accommodate the birders. He even won two appreciation awards from the Colorado Field Ornithologists, and the American Woodcock Society!



*American Woodcock*, photo by Karl Manderbach

### **Pollinators (Moths and Butterflies)**

Butterfly and moth surveys completed in 2004 found fewer species than expected in a natural area with the diversity of habitats found at Bobcat Ridge. The 19 species recorded were a third the number of species that would be expected in the spring. One possible explanation was the difficult cold/wet to warm weather variations during the spring of 2004, which caused the diversity and population of butterflies and moths to be reduced throughout Larimer County that year. Nonetheless, through ecological restoration efforts the Department aims to enhance larval host plants and nectar sources for species expected at Bobcat Ridge. The specific plant needs for butterflies and moths, both existing and expected are identified in Appendix C.

Further inventories of butterflies, moths, and other pollinators are planned for the site. The presence and absence of indicator species and NAD Species of Interest will guide restoration efforts and adaptive management practices.



*Moss' Elf*, photo by Steve Poole

## **2. Recommended 10-year Actions for Wildlife**

The Natural Areas Department *Wildlife Conservation Guidelines* (2017) identifies conservation goals and management strategies for wildlife across all City of Fort Collins Natural Areas. Goals and actions specific to wildlife at Bobcat Ridge focus on protecting, enhancing, or restoring habitats for both existing and expected wildlife. Areas of focus are:

1. Restoring the Mixed Grassland habitat to support a more diverse suit of birds and pollinators,
2. Restoring Mixed Foothills Forest to expand and improve habitat needed for existing obligate ponderosa pine wildlife,
3. Improving the Riparian Shrubland habitat to support Preble's meadow jumping mouse, pollinators, and birds,
4. Conducting additional wildlife surveys to monitor progress of restoration and management actions.

### **Elk Management**

Natural Areas will continue to consult with Colorado Parks and Wildlife to monitor elk herd movements and population. Additionally the Department will monitor the plant community for signs of over utilization of the site by elk. This effort will inform what management actions may be necessary to address any negative impacts to vegetation or other resources. Actions may include eliminating old alfalfa fields (a preferred food source), initiating a limited hunting program, or making restoration specific objectives that diversify food supply in favor of other species.

Public feedback on hunting in or around Bobcat Ridge was sought during this management plan update. A majority of respondents demonstrated an understanding that there is a need to responsibly manage the integrity of natural resources for all wildlife at Bobcat Ridge. Should it

be determined that a limited on-site hunt is warranted, further public outreach will be conducted in partnership with Colorado Parks and Wildlife.

If a limited hunt were to occur, it would be similar to existing limited hunting on other nearby open spaces such as Soapstone Prairie Natural Areas, Red Mountain Open Space, or Lory State Park. In conjunction with CPW, the Natural Areas Department would establish restrictions necessary to maintain public safety and recreation access, while meeting elk-herd management goals. Restrictions might include, limiting the number of hunters, type of game, method of take, days of the week, distance from trails, and areas closed to hunting. A Mentored Youth Hunt type of program could be considered.

#### Elk, Deer & Bighorn Sheep

- Implement a vegetation monitoring program to evaluate relationship between elk browsing and vegetation health.
- Collaborate with CPW to better understand elk movement patterns and early detection of resident herd formation and impact through the analysis of data-tracking collar data.
- Utilize results of vegetation monitoring and elk movement analysis to determine if management actions aimed at dispersing the elk herd are necessary.
- Monitor to find appropriate balance between domestic and wild grazing. Prioritize wildlife habitat over cattle forage needs.
- Notify CPW if Chronic Wasting Disease is identified at Bobcat Ridge.
- Employ temporary elk mating/calving season closures if disturbances are problematic.
- Remove fencing or barriers to wildlife movement as identified.
- Prohibit the use of domestic sheep or goat grazing to protect bighorn sheep from potential disease. Report bighorn sheep sightings to CPW.

#### Preble's Meadow Jumping Mouse (PMJM)

- Conduct a site-wide habitat assessment and trapping study for PMJM.
- Manage invasive and weedy species in PMJM habitat such as the rough cocklebur and Canada thistle around water sources.
- Restore Riparian Shrubland habitat to include specific PMJM habitat requirements.
- Determine the reintroduction feasibility of PMJM if habitat is meeting criteria.

#### Carnivores

- Continue citizen-science wildlife camera program. Improve data management of the photograph collection that permits the collection to be searched and analyzed. Potential analyses could include long-term trends, species presence/absence changes, timing, and location detection.
- Continue outreach on avoiding human-wildlife conflict and maintain wildlife resistant trash receptacles.

#### Bats

- Inventory bat species at Bobcat Ridge to better understand species present and potential habitat management based on these species.

- Identify, and protect roost sites such as cavity forming trees and snags, cliffs, and caves.
- Maintain buffer distances between active roosts and recreation or management activities.

### **Birds**

- Continue to monitor for raptor nests, implement seasonal closures and buffer zones as needed.
- Continue bird surveys in 2018 to help guide management actions and restoration targets.
- Restore diversity to Mixed Grassland habitats (currently brome fields) at Bobcat Ridge for grasshopper sparrow, green-tailed towhee (*Pipilo chlorurus*), lazuli bunting and brewer's sparrow.
- Leave all standing dead trees in place for cavity nesting bird species (bluebirds, owls, and woodpeckers).
- Minimize visitor access within extant areas of mature ponderosa pine forests. This habitat is important for breeding birds such as western tanager (*Piranga ludoviciana*), Bullock's oriole (*Icterus galbula*), western wood-pewee (*Contopus sordidulus*), and plumbeous vireo (*Vireo plumbeus*).
- Restore Mixed Foothills Forest habitat with removal of cheatgrass and additional pine plantings to provide habitat for ponderosa pine obligate bird species.
- For the protection of nesting grassland birds, mowing operations are prohibited prior to when nesting season is complete (typically July 15).
- Increase nectar sources for hummingbirds and other pollinators by increasing diversity of native forbs.

### **Pollinators (Butterflies & Moths)**

- Conduct site-wide survey of butterfly indicator species at Bobcat Ridge to monitor habitat functionality and restoration success.
- Protect and expand populations of Moss's elfin (*Callophrys mossi schryveri*), as well as other foothill grassland indicator species: arogos skipper (*Atrytone arogos*), Ottoe's skipper (*Hesperia ottoe*), crossline skipper (*Polites origenes*), and regal fritillary (*Speyeria idalia*) through habitat restoration and management practices (such as timing of mowing, burning or herbicide use).
- Include pollinator larval and nectar plants in future seed mixes as part of future restoration seed mixes (big bluestem, little bluestem, and diversity of native forbs).

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## Chapter 3. Visitor Experiences

- A. Visitor Experience Overview: Current and Future Trends
- B. Public Improvements
- C. Management Zoning and Trail-Use Impacts Analysis
- D. Public Engagement
- E. Cultural resources

### A. Visitor Experience Overview: Current and Future Trends

The natural features of Bobcat Ridge provide a variety of opportunities for a scenic getaway from daily life. Society increasingly recognizes the need for natural experiences in support of good health and wellbeing. Whether it's a quiet spot to reflect or watch wildlife, a walk through the past by visiting the homestead cabin, a rigorous hike to check out Mahoney Park, or a spine-tingling mountain-bike decent on the Ginny Trail, residents of Larimer County and beyond enjoy finding their own natural experience at Bobcat Ridge.

Bobcat Ridge's 18.6-mile trail system includes both multi-use and separate-use trails. It offers shorter, three to four mile treks through the Valley Loop and Eden Valley trails as well as destination excursions via the Ginny or DR trails that offer more challenging seven to 12 mile outings through Mahoney Park. The large picnic shelter near the parking lot is an Americans with Disabilities Act (ADA) accessible as is the 1.4-mile trail to the historic cabin. Interpretive panels and brochures describe both the natural and cultural history of Bobcat Ridge.

The Natural Areas Department offers a wide variety of public education programs from school field trips, geology hikes, historic interpretation, and astronomy nights. Volunteers have been actively involved in constructing and maintaining trails, monitoring wildlife cameras, and assisting with other important stewardship activities at the site. Since opening to the public, more than 21,000 people have engaged with Bobcat Ridge via educational programs, special events, and volunteer projects.

Current estimates suggest that 60 to 70% of Bobcat Ridge's visitors hike or run, 20 to 23% mountain bike, and 10 to 18% visit the trails via horseback. Visitation to Bobcat Ridge has



*Hikers at Bobcat Ridge Natural Area*

steadily increased over time, particularly in the last few years. In 2016, automated counters in the parking lot documented 46,000 vehicles, up from 30,000 vehicles in 2013. This represents an (averaged) annual increase of 16% during that time.

Many Front Range natural areas and open spaces are experiencing similar increases in visitation. A major factor of the increasing recreational demand is the growing population accessing the outdoors. From 2010-2015, Larimer County's population increased from 300,000 to 330,000. The State Demographer's Office projects the county's population to continue to grow to 366,000 residents in 2020 and 430,000 in 2030.

The 2005 management plan analyzed a number of possible visitor experiences, as Bobcat Ridge was the first regional natural area to offer potentially new recreational opportunities and management challenges. Significant emphasis was placed on natural and cultural resource protection, as well as visitor experience and safety. This goal has guided on-going decision-making since 2005 and has helped clarify the actions identified in this management plan update.

*The goal for Visitor Experiences at Bobcat Ridge is to provide a variety of recreational opportunities for people of all ages and abilities consistent with the Natural Areas Department's mission, carrying capacity of the site, and the Department's ability to deliver a safe, high quality visitor experience.*

Acknowledging the significance of the natural and cultural resources on site warranted careful consideration of the recreational uses, placement of public amenities such as parking lot and trails, and educational themes. Planning, designing, and installation of public amenities, trails, access, and public opening in 2006 was highly anticipated by the public and a major milestone in the Department's evolution.

## **B. Public Improvements**

### **1. Update on Actions Taken and Current Conditions**

The 2005 management plan identified infrastructure needs to provide public access and meet the goal detailed above. The major visitor amenities added to Bobcat Ridge since the 2005 plan were:

- Major improvements to access Road CR 32C to meet county flood protection standards,
- Completion of a parking lot with 46 vehicular, 2 handicap and 8 horse-trailer spaces,
- Trailhead amenities including a vault toilet, bear-proof trash cans, welcome kiosk, and interpretive information,
- A large picnic shelter with an ADA accessible trail and interpretive panels,
- A trail system constructed over a three-year timeframe resulting in a total of 18.6 mile of trails:
  - Valley Loop and Eden Spur (6.7 miles; hike/bike/horse),
  - Ginny Trail (5.4 miles; hike/bike only),
  - DR Trail (3.2 miles; hike/horse only),
  - Power Line Road (2.3 miles; bikes uphill only, hike/horse),
  - 1.4 miles of accessible ADA trail,

- An interpretive trail through restored, historic ranch buildings at the trailhead, as well as the restoration of a historic homestead cabin to the north,
- Technical mountain bike trail features added to the Ginny Trail in collaboration with volunteer mountain bike groups.

Natural Areas parking lots are planned and designed with visitor “carrying capacity” of the site in mind. Capping the number of parking spots preserves the visitor experience and minimizes the risk of negatively affecting the site’s wildlife and vegetation. The trails at Bobcat Ridge were constructed to minimize habitat impacts, utilize the existing road network, maximize access to scenic vistas, and provide separated-use access to desirable destinations. The separate use trails were designed specifically with the biker and equestrian in mind, resulting in very popular destinations. For safety, hazard trees are routinely removed from each side of the trails when necessary. Where the existing ranching road network was not repurposed as trails, the roads were decommissioned and rehabilitated. However, the former roadbed continues to service emergency access when needed. Trail easements through US Forest Service lands were acquired in 2008 and are monitored annually.

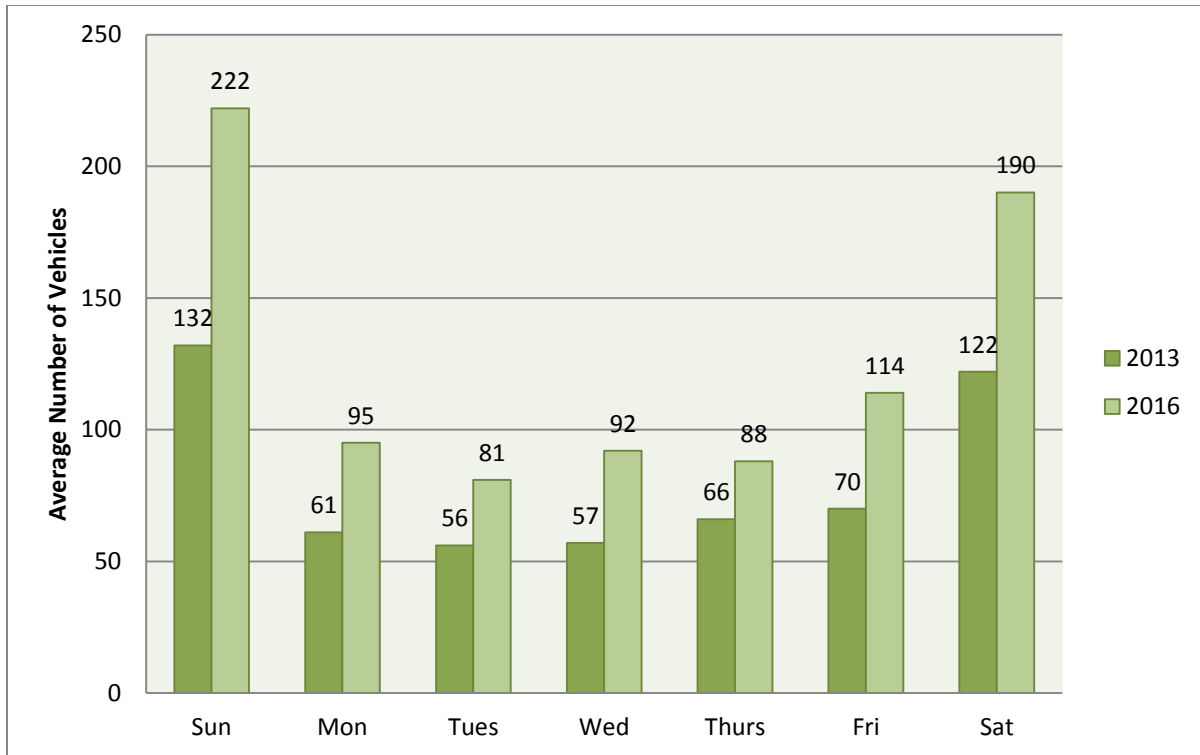
### **Parking Lot**

The parking lot has started to reach capacity during peak seasons and peak hours. With increasing recreational demands from a growing regional population, staff has noted an increase in days visitors are turned away because the parking lot is at capacity. The existing lot accommodates 46 cars, 2 handicap spaces, and 8 horse-trailer parking spaces. Spanning 1.29 acres, the current configuration maximizes buildable area while accounting for topographic constraints, historic resources, and the Department’s commitment to minimize further expansion into the natural area.

Along northern Front Range natural areas and open spaces, overcrowded parking lots are becoming more and more common. The number of vehicles turned away due to a full parking lot was documented in 2016 and totaled about 200 vehicles. This included 14 days that cars were turned away, and 12 days that horse trailers were turned away. This trend is also seen at other nearby natural areas and open spaces. Horsetooth Mountain Open Space, the closest comparative option, experiences overcrowding on a regular basis. Although numbers were not officially tracked, Horsetooth Mountain Open Space estimates that 200 – 1,000 vehicles are turned away on Saturdays and Sundays during peak seasons. Situations like this have prompted media attention to the crowding problem in regional natural areas and open spaces.

Figure 3.1 illustrates the increase in visitor numbers over the past three years. This graph depicts the average vehicle traffic by day in 2013 and marks the increase in 2016. Also of note is the consistently higher weekend traffic.





**Figure 3.1 Average Vehicle Counts by Day of the Week at Bobcat Ridge 2013 and 2016**

The Natural Areas Department has increased efforts and resources to manage parking including public outreach (social media, website, etc.), parking attendant services, and coordination between Horsetooth Mountain Open Space and Lory State Park to direct visitors to sites with available parking.

While the congestion in parking lots may give the impression that regional foothill natural areas are swarming with people, a majority of visitors do not appear to feel crowded at Bobcat Ridge. Outreach conducted in advance of this management plan update found that 58% of respondents felt that Bobcat Ridge was only slightly (or not at all) crowded; 37% felt moderately crowded; and only 3% felt very crowded. This may indicate that efforts to manage the site’s “carrying capacity” are helping to ensure a positive (uncrowded) experience. In written comments, visitors indicated that crowding in the parking lot seems to depend on time of visitation, (e.g., weekend mornings) and that once on the trails, crowding is not an issue. There also appears to be an understanding and support that creation of additional parking could deteriorate visitor experience (e.g., feeling crowded on the trails) and impact wildlife use of the site.

## 2. Recommended 10-year Actions for Public Improvements

### Parking Lot

While an overcrowded parking lot at Bobcat Ridge is periodically problematic for some visitors on beautiful-weather weekends, it is predicted to be an increasingly common occurrence. As such, peer organizations were consulted and potential measures to address parking issues over the next ten years were considered. Public feedback also helped the Natural Areas Department

understand what technologies visitors would be willing to use to plan for their visit to Bobcat Ridge. To help manage peak-demand times, the Natural Areas Department plans to:

- Continue targeted communications,
- Implement smart parking technologies,
- Add additional parking spaces within the existing parking lot footprint (up to five vehicle spaces and one additional horse-trailer space).

Public feedback indicates that visitors are interested in smart-phone technology and webcams to be better informed about parking conditions before arrival. The public also favored road signage on County Road 27 to inform visitors about current parking conditions prior to their arrival at Bobcat Ridge. A formal reservation system was not favored.



*Parking Lot at Bobcat Ridge Natural Area*

In partnership with Fort Collins City Parks and Larimer County Open Lands, the Natural Areas Department created a website that can be pinned to a Smartphone (similar to an app) in 2016 that provides updated trail conditions ([nocotrailreport.org](http://nocotrailreport.org)). Plans are currently being made to add parking lot conditions. Signs that can be updated to indicate a full parking lot prior to arrival have been used successfully by peer agencies. Peer agencies utilizing webcam technology report that it seems to deter additional visitation during peak demand. A combination of these strategies is in the works to enhance public awareness and manage peak-demand parking situations.

The current parking lot configuration maximizes buildable area. Within this existing footprint, up to five more vehicle spaces and one horse-trailer space could be added. This addition would

require a minimal investment and would allow Bobcat Ridge to accommodate a few extra vehicles at peak-demand times without compromising visitor experience, vegetation or wildlife.

## **Trails**

Over the years, the Natural Areas Department has received requests to modify trail regulations or add trail extensions to create additional loops. Some suggestions have included proposals to change the separate-use designation trails to multi-use, improve the Powerline Road/Trail to create an enhanced mountain loop, add more trails overall, and create regional trail connections. As part of the process to update the management plan, the Department examined opportunities to modify the trails and sought public feedback.

The suggestion to change the trail designations from separate-use to multi-use stemmed from a desire to create a longer, mountain loop that circumnavigates the difficult Powerline Trail. Poudre Valley Rural Electric Authority (PVREA) owns the powerline and conducts maintenance work via a road easement. This road also doubles as the Powerline Trail, which remains open for multi-use to create a mountain loop, or provides a shorter, steeper route to Mahoney Park. The uphill only bike regulation is intended to alleviate safety concerns associated with high-speed descents.

Improvements to the road were recently made when it became an emergency evacuation route for the communities west of Bobcat Ridge during the floods of 2013. The topography in the area along this road alignment makes it challenging to offer additional trail improvements. The Natural Areas Department, with support from public feedback, will keep the separate-use designation of the DR and Ginny trails to maintain the high-quality visitor experiences reported by both bikers and equestrians that make the most of these rare, separate-use opportunities. Public feedback for this plan update found 74% of respondents were satisfied or very satisfied with the current trail system.

While there is high satisfaction with the trail system at Bobcat Ridge, adding more trails is also highly desired. Two new trail proposals examined as part of the management plan update included a moderately difficult loop and a loop extension to the Ginny Trail.

Utilizing the International Mountain Bike Association's (IMBA) rating system, the Valley Loop and Eden Spur trails are designated as "easy" and the Ginny and Powerline trails are designated



*Valley Loop Trail at Bobcat Ridge Natural Area*

“difficult” or “expert.” Local mountain biking groups argue that the site lacks an intermediate mountain biking experience. This became the inspiration for an intermediate level trail proposal. Staff examined a variety of potential alignments that could provide this experience, however, it was determined that the combination of topographic constraints (steep slopes, deep canyons, and rock outcrops) and the sensitivity of the Riparian Shrubland habitat conflicted with management goals of habitat protection and sustainable trail alignments.

Local mountain bikers proposed the creation of a half-mile, highly technical trail to the west end of the Ginny Trail above Mahoney Park. As the proposed trail crisscrossed multiple rock outcroppings, it earned the “On the Rocks Trail” name describing the setting.

Upon analysis of the unique plant communities, wildlife habitat, and public comments, staff determined that this addition to the trail system would have limited impact to the area’s natural resources while providing a new opportunity for bikers, hikers and runners at Bobcat Ridge. The trail alignment largely occurs within the 390-foot “area of influence” within the existing trail system. It does not fragment the larger trail-free areas of the natural area that provide wildlife refuge from frequent trail-use. (See Trail-Use Impact Analysis section C2 for more information). In addition, this trail alignment creates a loop at the end of the Ginny Trail, which may satisfy requests for a mountain loop trail and discourage illegal bicycle use on the DR Trail.

Lastly, the Natural Areas Department supports regional trail connections as they become available. The Powerline Road continues west of Bobcat Ridge onto US Forest Service and private property, making it unavailable for a public trail system. The Larimer County Open Lands Master Plan has envisioned a regional trail connection through Bobcat Ridge that could be possible after conserving or attaining trail easements on key parcels of land. The Natural Areas Department will continue to play a role in conserving land for landscape connectivity as well as for regional trail connections.

Summary of Actions for trails:

- Maintain separate-use trail designations,
- Increase outreach on trail difficulty ratings,
- Construct On the Rocks Trail with volunteers (approximately half mile) to open in 2019,
- Cooperate with other agencies on regional trail connections as opportunities arise.

## **C. Management Zoning and Trail-Use Impact Analysis**

### **1. Management Zoning**

In 2011, the Natural Areas Department developed a new system of management zoning to more effectively manage natural resource protection and visitor use within natural areas along the Poudre River. This zoning approach is being applied system-wide as other natural area management plans are developed or updated.

The Management Zoning System consists of five zones (0 to 4) ranging from areas closed to public use to “focal areas” prescribed for intensive public use. A modifier is added to the zoning designation to describe whether on-trail only or off-trail use will be permitted.

The majority of Bobcat Ridge Natural Area is zoned 2B (Resource Protection with permissible off-trail use). A few Closed Zones are designated for safety purposes and/or very significant wildlife habitat. The parking lot and nearby trails with the historic infrastructure are considered a Focal Recreation Zone (Zone 4). See Figure 3.2 for the zoning map.

### **Management Zones:**

Zone 0 – Closed Natural Area: The entire natural area is not open for public access. The natural area is either not intended for public use or is not yet open due to lack of public amenities (e.g., trails, parking lots) required prior to opening.

Zone 1 – Closed Zones: Portions of a natural area that are not open to the public due to one or more reasons specified below. In closed zones, trails and other public amenities either do not exist or are intended for maintenance purposes only. All Zone 1 – Closed Zones are modified as “C – no trails available.” Reasons for closures may include:

- Areas closed for *conservation* or wildlife refuge
- Areas where no *formal access* is provided
- Areas closed due to *public safety concerns*
- Areas under *long-term restoration* (typically 10 years or more)
- Areas closed due to the presence of *cultural artifacts*
- Areas closed on *leased land* because public access is not allowed by the terms of the lease

Zone 2 – Resource Protection Zones: Portions of a natural area where conservation and resource protection are the highest priorities. Visitor access is generally limited to on-trail or trailside activities. Public amenities are limited or nonexistent. Temporary or seasonal closures may be implemented for resource protection, restoration, or other reasons.

Zone 3 – Natural Experience Zones: Portions of a natural area intended to provide visitors with a place to connect with nature and enjoy site appropriate recreation. Off-trail use is generally allowed and public amenities may exist, though, not to the scale or frequency of a focal area (Zone 4). Temporary or seasonal closures may be implemented for resource protection, restoration, or other reasons.

Zone 4 – Focal Recreation Zones: Portions of a natural area that provide intense and directed recreation. These are developed areas intended to provide defined recreation or access to recreation. Focal areas generally include parking lots, picnic areas, boating or fishing access points, designated rock climbing areas, etc. Temporary or seasonal closures may be implemented for resource protection, restoration, or other reasons.

### **Trail Modifiers (Regulatory Zoning):**

- A – On-trail only
- B – Off-trail use allowed
- C – Closed, no trails available (Zone 1)

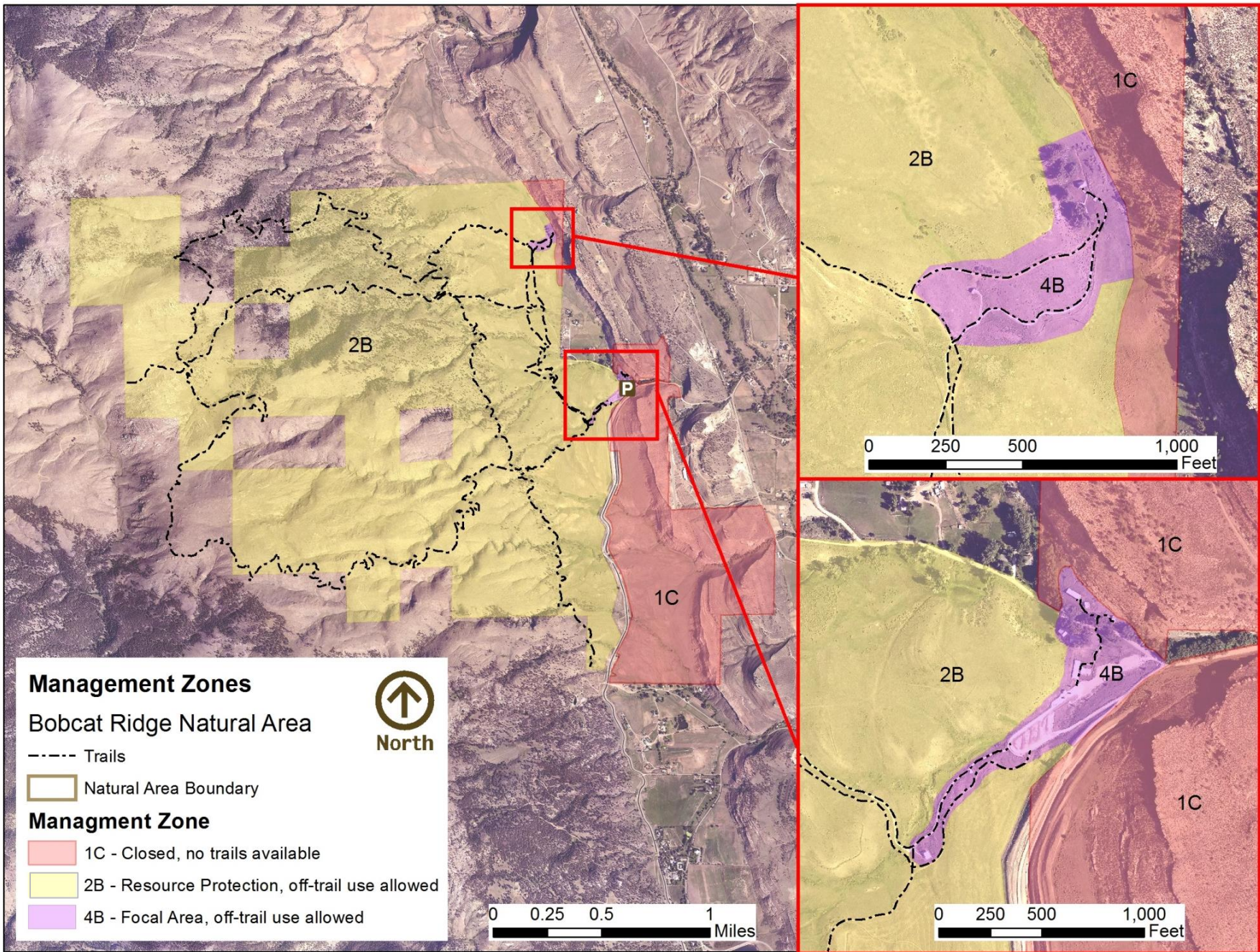
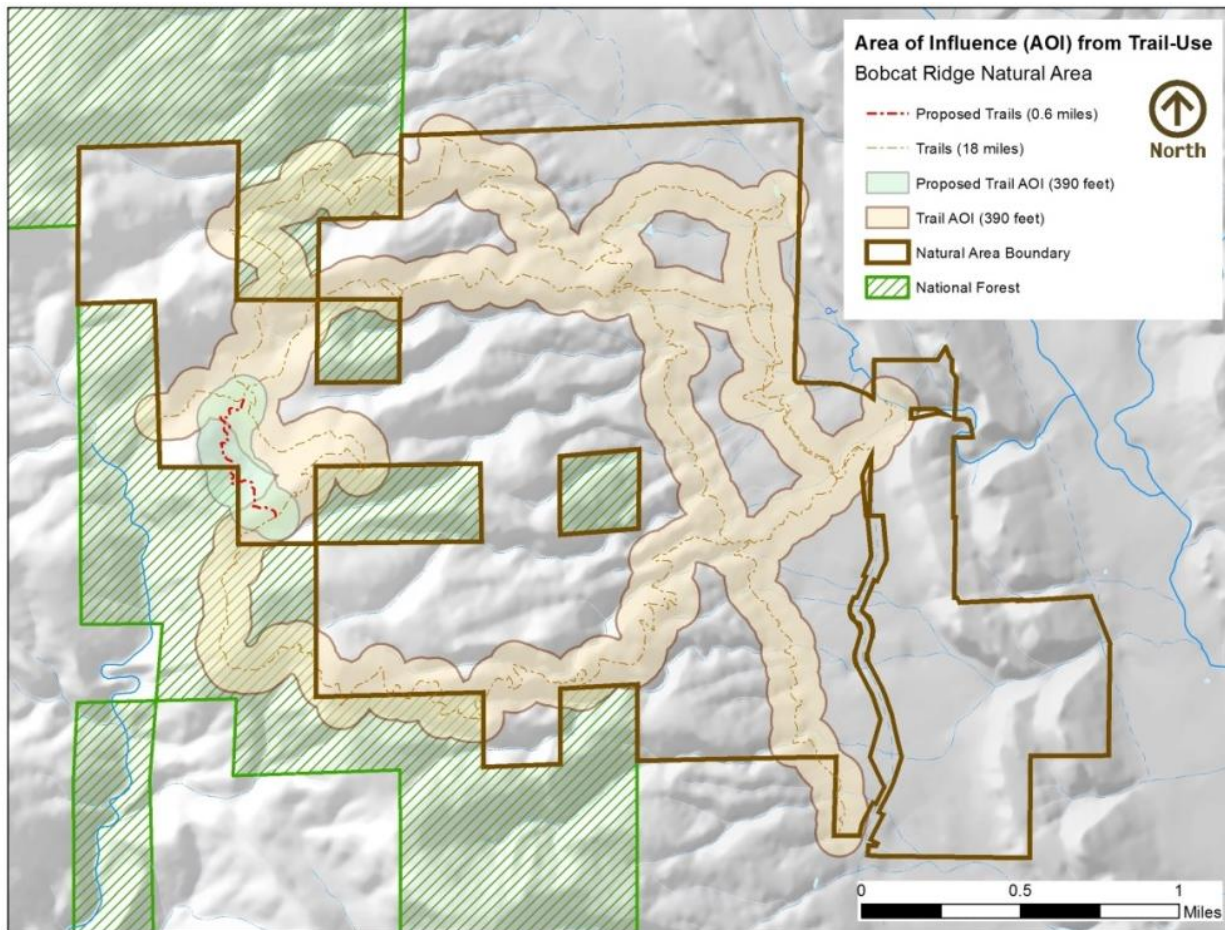


Figure 3.2 Management and Regulatory Zoning for Bobcat Ridge

## 2. Trail-Use Impact Analysis

As a best management practice and as part of this management plan update, the Natural Areas Department evaluated the possible impact of trail-use on wildlife and habitat. A review of the scientific literature informed and guided the selection of appropriate criteria and methodology. Published literature was found for species and habitats similar to Bobcat Ridge; mule deer (Taylor and Knight 2003), a variety of bird species (Knight, 1998), and black bear (Erb et al., 2014). Behavior impacts on wildlife from trail-use included avoidance of high quality habitat (den sites, nesting sites, food sources, etc.), flushing distances, and reproduction/survival rates. The most conservative distance from trails that avoided wildlife disturbance was a 390-foot buffer from each side of the trail. Areas within 390 feet to either side of the trail are considered “areas of influence” for impacts to wildlife.



**Figure 3.3 Area of Influence Analysis for trail-use at Bobcat Ridge. Total Area of Influence including proposed new trail is 1,257 acres (including some National Forest Service property).**

Based on these studies, the Natural Areas Department determined that a 390-foot area of influence on each side of a trail was a reasonable, conservative parameter from which to guide trail location decisions. As part of this management plan update, new trail proposals were evaluated using the additional area of influence that would result from creation of a new trail. Figure 3.3 shows the total area of influence from existing trails along with the proposed “On the Rocks Trail.” The new trail adds only 2% of new area of influence to the existing trails. For this reason, as well as the

absence of riparian habitat, the Natural Areas Department determined that impacts to wildlife were likely to be small to insignificant with the addition of the On the Rocks Trail.

## **D. Public Engagement**

### **1. Update on Actions Taken and Current Conditions**

Rich in natural and cultural history, Bobcat Ridge is ideal for a wide array of educational programming. Visitor amenities, including a large picnic shelter, easily accessible historical structures, family-friendly trails, dark skies, and proximity to both Fort Collins and Loveland, support educational programming. The interpretive theme for Bobcat Ridge is *“Bobcat Ridge Natural Area is a place to be treasured because of its diversity of habitats, wildlife, and conserved remnants of the past.”*

The 2005 management plan identified several education objectives and actions that have been largely accomplished. Shortly after the opening of Bobcat Ridge, the Natural Areas Department was awarded a grant from the Pulliam Charitable Trust to fund a part-time education position. The Bobcat Ridge educator position provided public programming and supported school field trips engaging more than 12,000 people at Bobcat Ridge through more than 500 programs. The Pulliam Charitable Trust provided substantial financial support to the Natural Areas Department’s education efforts at Bobcat Ridge. Public engagement methods at Bobcat Ridge entail community programs, special events, school field trips, service learning, remote cameras, interpretive features, printed materials, and technology.

#### **Community Programs**

Current and past programming topics include geology explorations, monthly wildflower walks, birding, wildlife, geology, and pioneer life hikes. Due to its dark skies and quiet setting, Bobcat Ridge hosts many nighttime programs. Astronomy nights are currently held on a monthly basis April–October. Since opening Bobcat Ridge, community programs have reached over 8,000 people. Typically 30-60 programs have been offered annually, with an average of 900 people attending each year.

#### **School Field Trips**

Bobcat Ridge is the ideal outdoor classroom because of the diverse habitats and access to historic structures. Field trip topics include cultural history, pioneer living, geology, foothills ecosystems, fire ecology, signs of wildlife, plant identification, and trail etiquette. Over the past nine years, 4,000 Poudre School District students have taken a school field trip to Bobcat Ridge. Likewise, programming is provided to all Thompson School District fifth graders (2007-2014) and fourth graders (2014-2017) at Bobcat Ridge, through the Pulliam Scholars program at Colorado State University (CSU). Since its inception, nearly 8,000 students have participated in these field trips.

#### **Volunteers**

Volunteerism is a key component to engage the public in environmental stewardship. A majority of the school and community programs are conducted by volunteers trained by the Natural Areas Department called Master Naturalists. At Bobcat Ridge, volunteers also assist with the citizen-science wildlife camera project, maintain and add special features to the trails through the Adopt-a-



Trail program, and assist with managing the parking lot or patrolling trails. Since 2007, volunteers have donated more than 12,600 hours.

### **Interpretive Panels and Features**

Interpretive features allow visitors to learn and appreciate the ecology and history of Bobcat Ridge. This is balanced with providing visitors a clear orientation to the site, regulations, and how to be a good steward. Interpretive signage was installed in phases from 2006-2016. There are 21 interpretive signs along the trails and 28 small plaques describing various tools and implements in the restored buildings. Topics covered are: orientation, safety, stewardship, homesteading, pioneer life, wildlife, fire, birds, the importance of ravines in a dry landscape, Mahoney Park geology, and the tipi ring.

### **Supplementary Materials**

Many of the products envisioned in the 2005 management plan have been published. Printed materials are available at Bobcat Ridge, in the Natural Areas Department offices, and website:

*Bobcat Ridge Brochure* – This site-specific brochure includes a trail map with distances and elevation gain, rules and regulations, and a brief overview of the site. It is regularly updated.

*Pieces of the Past* – Completed in 2008, this document provides a detailed history of the settlers that came and went on Bobcat Ridge. Extensively researched, the genealogy of each settler family and their descendants' memoirs gives insight into a bygone way of life. Some descendants still live in the area.

*Working the Land: Creating a Life* – This booklet highlights the families that lived at Bobcat Ridge, the buildings they constructed, and daily life on the ranch. It contains quotes, photos, and locations so visitors can identify the appropriate buildings and families.

*Birds of Bobcat Ridge* – Since 2004, Fort Collins Audubon Society (FCAS) has conducted a monthly bird survey at Bobcat Ridge. In 2012, they created a bird checklist for the site. It is available to the public and is stocked at the kiosk.

*Videos* – two videos (both available on the NAD website) have been produced. One prepares students for their field trip at Bobcat Ridge and the other provides an overview of the natural area, wildlife, history, and ecology.

## **2. Recommended 10-year Actions for Public Engagement**

The objective of public engagement over the next ten years is to continue successful education efforts as staff capacity, site capacity, and visitor interests dictate. To do this, the Natural Areas Department will:

- Continue to provide educational field trips for community members which highlight the area's rich natural and cultural history.
- Continue to offer school field trips; adapt topics and lesson plans as standards and teacher needs vary.
- Continue to provide volunteer opportunities to support site management.

- Maintain, update, and replace interpretive features as needed. Some topics may change. No additional interpretive panels or features are planned for the next ten years.
- Update and reprint the site-specific brochure with trails map, and in cooperation with Fort Collins Audubon Society, update and reprint the site-specific bird checklist as needed. The cultural history documents will not be reprinted, however they will remain available on the Natural Areas Department website.
- Continue to maintain the Bobcat Ridge-specific webpage, and explore new opportunities for technology as an interpretive educational tool and method of outreach.

## E. Cultural Resources

The objective for historical and archeological resources from the 2005 plan included actively preserving the cultural resources at Bobcat Ridge. Over the past ten years, the active preservation or restoration has been completed. The updated objective will be: *Maintain existing cultural resources and continue to interpret the significant human history of the site.*

### 1. Update on Actions Taken and Current Conditions

Bobcat Ridge Natural Area is home to a variety of historical buildings, artifacts, and other cultural resources that are representative of the settlement era in this area of Larimer County. A number of artifacts found within the natural area records evidence of early Native American presence at Bobcat Ridge. Parts of the property have been a working ranch since the area was first homesteaded in the late 1800s. Numerous structures associated with the early homestead period and later ranching history speak to the significance of the livelihoods staked out by early settlers in Larimer County.

Since the 2005 management plan, significant efforts have been made to further understand the history of the site and preserve time-honored structures and artifacts that provide key interpretation opportunities for visitors and cultural historians alike.

The Hyatt-Spence-Pulliam Ranch, now known as Bobcat Ridge, represents 125 years of farming, cattle ranching, irrigation, and pioneer settlement in the foothills region. It is an excellent remaining example of a cattle ranch and poultry operation from the early twentieth century. In the mid-1880s, Hamilton and Olive Hyatt homesteaded the property and constructed the earliest buildings existent on the site. In 1938, Hunter and Estes Spence bought the property and expanded the poultry operations. In 1961, David Rice and Virginia D. Pulliam bought the ranch and shifted the use to extensive cattle herds, including the experimental breeding of Limousine cattle.

The ranchstead expresses the range of functional agricultural buildings, which represent the evolution of agricultural use of the property. The site hosts a ranch house and garage, a sharecropper's cabin, calving barn, hay shed, pioneer barn, chicken house, equipment shed, poultry shed, a system of clustered corrals with loading chute, three wells, a portable squeeze chute, five farming implements, the family grave site, and the remains of the family orchard all contained within a rural landscape setting.

The Pulliam Charitable Trust and the State Historical Fund have provided significant financial support to fund the restoration and preservation of the site's historical structures. After review by the City's Historic Preservation Division, the boxcar was removed and the remaining buildings were preserved or restored for educational and storage purposes. In 2010, History Colorado and State Historic Preservation Office listed the Hyatt-Spence-Pulliam Ranch in the Colorado State Register of Historic Properties. The



*Historic chicken house and pioneer barn at Bobcat Ridge Natural Area*

The designation was made based on the site's representation of early exploration and settlement of the area, and the ensuing development of local agriculture for the period of 1885 – 1975. The historically designated area consists of the Ranger office (the original ranch house), the calving shed, hay shed, corrals, pioneer barn, chicken house, equipment shed and poultry shed. The chicken house, the oldest building on site, is from circa 1888. The Kitchen/Smith cabin in the northeast corner of Bobcat Ridge is from 1917 and is a destination for many school groups.

Today, the site and its buildings provide a rare resource that helps visitors understand pioneer subsistence-level living thanks to the support from the Pulliam Charitable Trust. Their funding allowed for a historian to research the site's history, an environmental educator, the transportation for students to the site, as well as materials and supplies necessary to provide educational programming.

## **2. Recommended 10-year Actions for Cultural Resources**

- Continue interpretive materials and programming. Some documents may not continue to be printed, but will be available online.
- Maintain existing and restored historic structures.
- Continue to attract external sources to fund cultural preservation projects.
- Continue the practice of conducting archaeological and historic surveys prior to ground disturbing projects.
- Continue coordination with the Colorado State Historic Preservation Office and the State Archaeologist for cultural history support when advancing preservation projects or developing interpretive programs or materials.

## **References:**

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## Chapter 4. Updates to Site Administration

- A. Existing Easements & Leases
- B. Summary of Special Use Permits
- C. Updates to Facility Operations & Management
- D. Updates to Visitor Services & Emergency Response

### A. Existing Easements & Leases

#### **Powerline Maintenance**

The Poudre Valley Rural Electric Authority (PVREA) maintains a permanent utility easement through Bobcat Ridge to supply power to communities to the west of the natural area. As a condition of the easement, the Powerline Road/Trail must remain accessible to the PVREA for routine maintenance, repairs, and limb up tree branches when necessary. Following the flood in the Big Thompson canyon in September 2013, the Powerline Road was utilized by a large number of residents from the Cedar Creek community as the only possible access during reconstruction of State Highway 34. During this time, the Natural Areas Department worked to improve the road so that low clearance vehicles could cross safely. In December 2016, a combination of high winds and a spark from construction efforts resulted in a 200 acre wildfire that severely affected areas within and adjacent to Mahoney Park. Restoration of the burned area will be initiated in 2017.

#### **Hansen Feeder Canal**

The Northern Colorado Water Conservancy District (NCWCD) operates the Hansen Feeder Canal, which transfers water from Carter Lake to Horsetooth Reservoir in Larimer County. An access road runs parallel to the canal and is used by NCWCD for routine maintenance and inspection. The City retains legal use of the access road for routine operations at Bobcat Ridge, and entry in emergencies. The canal access road serves as an emergency route through the Eden Valley neighborhood (on Bobcat Ridge's south boundary) should County Road 32C become impassible due to flood, fire, or other events.

#### **Trail Easement with the US Forest Service (USFS)**

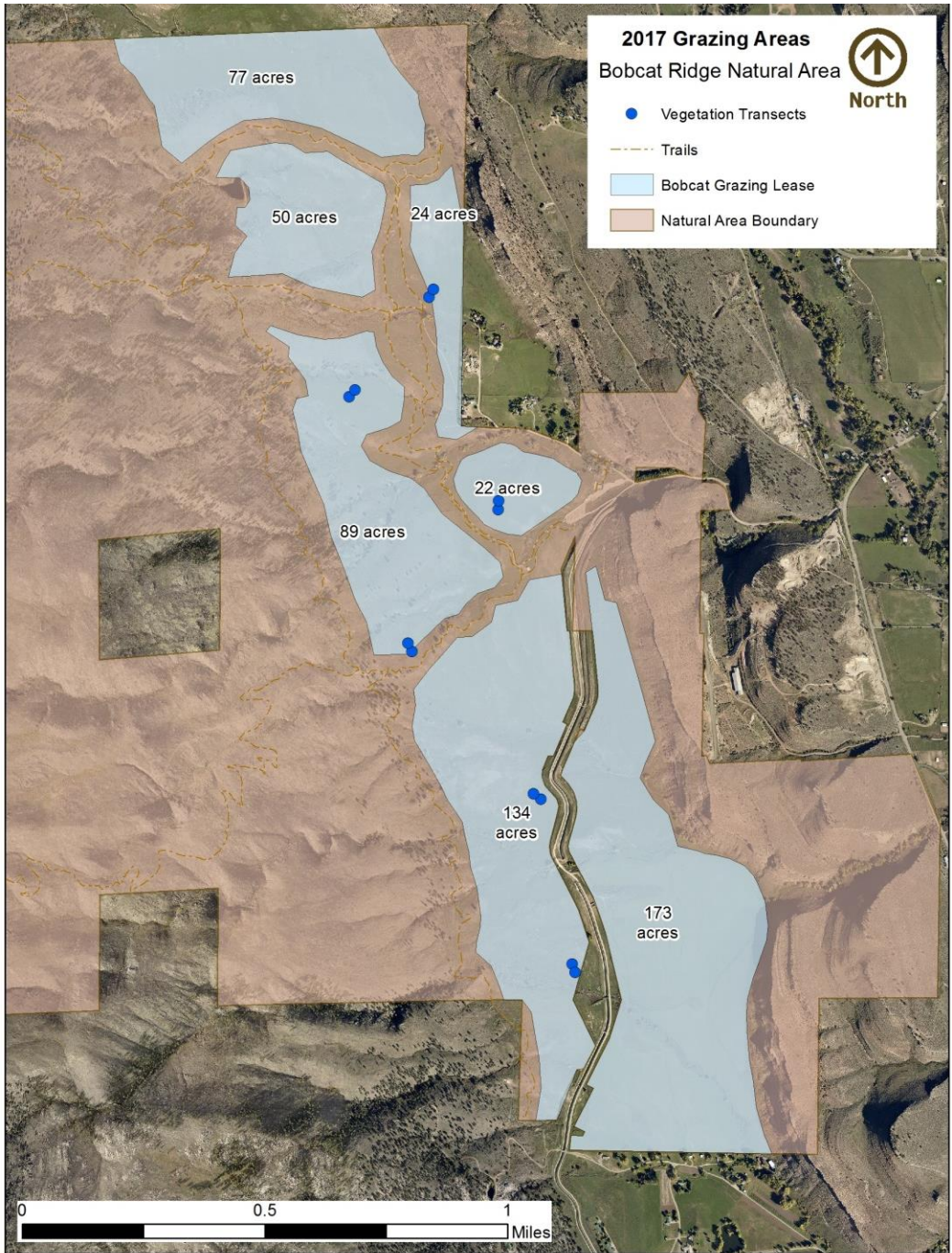
Bobcat Ridge shares a boundary with the Arapaho-Roosevelt National Forest managed by the US Forest Service (USFS). The Forest Service continues to own and manage 160 acres on three separate in-holding parcels within Bobcat Ridge. These parcels, and the adjacent lands, are managed as part of the Cedar Park Geographic Area as forest flora and fauna habitats, and scenery. This management direction is consistent with the Natural Areas Department's management guidance for the site. In June 2007, a Special Use Permit issued by the USFS authorized the construction of 2.4 miles of trail within Forest Service parcels that abut Bobcat Ridge (portions of the DR and Ginny trails). As part of the trail easement, NAD is required to meet Forest Service standards consistent with the flora, fauna, and wildlife management as well as conforming to USFS trail standards. Unless sooner terminated, or revoked by the USFS, the trail easement is valid until 2027.

#### **2016 Cattle Grazing Lease**

In 2016, the Natural Areas Department issued a three-year grazing lease to Sylvan Dale Ranch (Loveland, CO) which manages approximately 50 to 100 cattle for eight to twelve weeks in the spring and fall. Timing and stocking rate depends on range conditions, NAD goals, and other

factors. Approximately 570 acres within the valley are designated for grazing in the three year period. The site is divided into multiple pastures and rotational grazing practices are used.

The intent of cattle grazing is to advance conservation goals for the site including: increasing forb abundance and diversity, promoting habitat heterogeneity, increasing native grasses composition, supporting grassland bird diversity, and controlling noxious weeds.



**Figure 4.1 2016 Grazing Areas**

## **B. Summary of Special Use Permits**

Since 2005, special use permits have been issued to individuals or organizations wishing to conduct scientific research or inventory of Bobcat Ridge's flora, fauna, and ecological systems. The most frequent requests are related to examination of the post-fire effects of the 2000 Bobcat Gulch wildfire and inventory of the site's bird populations. Other significant permits have been issued for rare plant inventory, collection of insects (primarily moths and butterflies), and installation of wildlife monitoring cameras. Research findings are shared with the Natural Areas Department to expand knowledge and inform future site management.

## **C. Updates to Facility Operations & Management**

The 2005 plan identified a need for an on-site ranger. The ranch house on-site was renovated in 2007 and 2008. The current office is the preserved historic part of the house. The non-historic section of the house was rebuilt and is now the ranger residence. A Natural Areas Ranger moved in during the fall of 2008. Natural Areas is responsible for the on-going maintenance of this facility.

When Bobcat Ridge was first acquired as a natural area, neighbors were concerned with the possibility of the public venturing down the private drives along CR32C. The Natural Areas Department installed signs indicating that beyond the entrance to Bobcat Ridge is for local traffic only. The on-site ranger is in regular communication with neighbors; this fosters clear communication channels and allows minor issues to be handled preemptively. The Natural Areas Department significantly improved access road CR32C in 2006. Larimer County continues on-going maintenance of the road, grading it as needed.

## **D. Updates to Visitor Services & Emergency Response**

Natural Areas Rangers are responsible for overseeing visitor use and monitoring resource protection at Bobcat Ridge. In the decade since 2006, when Bobcat Ridge opened to the public, rangers have enforced natural area regulations, managed crowded parking lots, initiated wildfire response, conducted searches for missing persons, and assisted injured visitors. Since the fall of 2008, one full-time ranger has lived on-site to provide nighttime site security. In conjunction with Colorado Parks and Wildlife, rangers have worked closely to deter illegal hunting on Bobcat Ridge. The on-site ranger also performs light maintenance duties such as restroom cleaning, snowplowing, and gate repair. Finally, rangers are responsible for closing and opening the site or trails due to weather impacts or trail damage.

The most frequent enforcement issues at Bobcat Ridge are the prohibition of dogs, trespassing temporary closures, and hours of operation. In response to dog regulations, rangers have added highly visible signs to the entrance and parking lot, reminding visitors that dogs are prohibited at the Bobcat Ridge. To assist with hours of operation, automated gates were installed. The automated gates are monitored to ensure the opening/closure time remains consistent with sunrise and sunset through the seasons.

Managing the crowded parking lot on weekends and holidays is the most significant investment of ranger time. For the past three years the Natural Areas Department has hired part-time seasonal (May – September) employees to staff the parking lot during weekends and holidays. Chapter 3/

section B describes related management issues and proposed management actions for the parking lot in detail.

### **Operations & Emergency Response**

In keeping with the recommendation from the 2005 management plan, the *Bobcat Ridge Operations Manual* was completed in 2009 and is updated as necessary, most recently in 2014. The manual covers visitor services and law enforcement responsibilities as well as all aspects of the daily operations of the property including maintenance and procedures for buildings, boundaries, site closures, equipment, wildlife cameras, lease information, safety, and emergency response.

In the past decade, Bobcat Ridge has been closed a number of times due to wildfire on the property, or to provide vehicular access for residents of the Big Thompson canyon following the devastating 2013 flood. Emergency response plans outlined in the *Bobcat Ridge Operations Manual* include detailed plans for such things as landing helicopters during medical emergencies, search and rescue procedures, and evacuating the property in the event of wildland fires. It also outlines which agency would be responsible for responding to certain types of incidents on the property.

Looking forward, updates to the *Bobcat Ridge Operations Manual* will likely include updated procedures pertaining to parking lot crowding during peak use, the grazing lease, and potentially limited hunting.



*2016 Wildfire at Bobcat Ridge Natural Area*



# Appendix A. Documented Species List: Plants

(Updated February 2017)

Species Name	Common Name	Origin	Species of Interest List*	Ranking of CNHP Tracked Species**
<b>FERNS AND FERN ALLIES</b>				
<b>Family- Aspleniaceae</b>				
<i>Asplenium septentrionale</i>	Forked spleenwort	N	Yes	G4G5 S3S4
<b>Family - Dryopteridaceae</b>				
<i>Cystopteris fragilis</i>	Brittle bladderfern	N		
<b>GYMNOSPERMS</b>				
<b>Family - Cupressaceae</b>				
<i>Juniperus scopulorum</i>	Rocky Mountain juniper	N		
<b>Family - Pinaceae</b>				
<i>Pinus ponderosa</i> var. <i>scopulorum</i>	Ponderosa pine	N		
<i>Pseudotsuga menziesii</i> var. <i>glauca</i>	Douglas fir	N		
<b>ANGIOSPERMS</b>				
<b>Family - Aceraceae</b>				
<i>Acer glabrum</i>	Rocky Mountain maple	N		
<b>Family - Agavaceae</b>				
<i>Yucca glauca</i>	Yucca	N		
<b>Family - Amaranthaceae</b>				
<i>Amaranthus retroflexus</i>	Redroot pigweed	E		
<b>Family - Anacardiaceae</b>				
<i>Rhus trilobata</i> var. <i>trilobata</i>	Skunkbrush	N		
<i>Toxicodendron rydbergii</i>	Poison ivy	N		
<b>Family - Apiaceae</b>				
<i>Conium maculatum</i>	Poison hemlock	E		
<i>Harbouria trachypleura</i>	Whisk-broom parsley	N		
<i>Lomatium orientale</i>	Salt & Pepper	N		
<i>Musineon divaricatum</i>	Leafy wildparsley	N		
<b>Family - Apocynaceae</b>				
<i>Apocynum androsaemifolium</i>	speading dogbane	N		
<i>Apocynum cannabinum</i>	Indianhemp	N		
<b>Family - Asclepiadaceae</b>				
<i>Asclepias speciosa</i>	Showy milkweed	N		
<i>Asclepias viridiflora</i>	Green milkweed	N		

Species Name	Common Name	Origin	Species of Interest List*	Ranking of CNHP Tracked Species**
<b>Family - Asteraceae</b>				
<i>Achillea millefolium</i> var. <i>occidentalis</i>	western yarrow	N		
<i>Arctium minus</i>	burdock	E		
<i>Ambrosia psilostachya</i>	Cuman ragweed	N		
<i>Arnica fulgens</i>	foothill arnica	N		
<i>Artemisia frigida</i>	Fringed sage	N		
<i>Artemisia ludoviciana</i>	Cudweed sagewort	N		
<i>Brickellia californica</i>	California brickelbush	N		
<i>Carduus nutans</i>	Musk thistle	E		
<i>Chrysothamnus viscidiflorus</i>	yellow rabbitbrush	N		
<i>Cirsium arvense</i>	Canada thistle	E		
<i>Cirsium flodmanii</i>	Flodman's thistle	N	Yes	G5 SNR
<i>Cirsium undulatum</i>	Wavy-leaf thistle	N		
<i>Cirsium vulgare</i>	bull thistle	E		
<i>Conyza canadensis</i>	horseweed	E		
<i>Dyssodia papposa</i>	Fetid marigold	N		
<i>Ericameria nauseosa</i>	Rubber rabbitbrush	N		
<i>Erigeron divergens</i>	Spreading fleabane	N		
<i>Erigeron flagellaris</i>	fanleaf fleabane	N		
<i>Gaillardia aristata</i>	Indian blanketflower	N		
<i>Gnaphalium palustre</i>	western marsh cudweed	N		
<i>Grindelia squarrosa</i>	Curlycup gumweed	N		
<i>Gutierrezia sarothrae</i>	Broom snakeweed	N		
<i>Helianthus annuus</i>	Annual sunflower	N		
<i>Helianthus pumilus</i>	Prairie sunflower	N		
<i>Heterotheca villosa</i>	Hairy goldenaster	N		
<i>Lactuca serriola</i>	Prickly lettuce	E		
<i>Liatris punctata</i>	Dotted gayfeather	N		
<i>Lygodesmia juncea</i>	Skeletonweed	N		
<i>Machaeranthera pinnatifida</i>	lacy tansyaster	N		
<i>Nothocalais cuspidata</i>	Wavy-leaf false dandelion	N		
<i>Onopordum acanthium</i>	Scotch thistle	E		
<i>Picradeniopsis oppositifolia</i>	Opposite leaf bahia	N		
<i>Ratibida columnifera</i>	Prairie coneflower	N		
<i>Scorzonera laciniata</i>	False salsify	E		
<i>Solidago speciosa</i> var. <i>pallida</i>	showy goldenrod	N		
<i>Symphotrichum falcatum</i> var. <i>falcatum</i>	white prairie aster	N		
<i>Taraxacum officinale</i>	Dandelion	E		

Species Name	Common Name	Origin	Species of Interest List*	Ranking of CNHP Tracked Species**
<b>Family - Asteraceae</b>				
<i>Thelesperma megapotamicum</i>	Hopi tea greenthread	N		
<i>Townsendia grandiflora</i>	Largeflower daisy	N		
<i>Townsendia hookeri</i>	Easter daisy	N		
<i>Tragopogon dubius</i>	Yellow salsify	E		
<i>Tragopogon pratensis</i>	salsify	E		
<b>Family - Boraginaceae</b>				
<i>Cryptantha virgata</i>	Miner's candle	N		
<i>Cynoglossum officinale</i>	Houndstongue	E		
<i>Lithospermum incisium</i>	Narrow-leaf puccoon	N		
<i>Lithospermum multiflorum</i>	Manyflowered stoneseed	N		
<i>Mertensia lanceolata</i>	Prairie bluebells	N		
<b>Family - Brassicaceae</b>				
<i>Alyssum simplex</i>	alyssum	E		
<i>Arabis glabra</i> Weber- <i>Turritis glabra</i> Ackerfield- <i>Turritis glabra</i>	tower mustard	N		
<i>Camelina microcarpa</i>	false flax	E		
<i>Capsella bursa-pastoris</i>	Shepherd's purse	E		
<i>Chorispora tenella</i>	Blue mustard	E		
<i>Descurainia pinnata</i> ssp. <i>brachycarpa</i>	Western tansymustard	E		
<i>Descurainia sophia</i>	Flixweed	E		
<i>Lepidium densiflorum</i>	common pepperweed	N/E		
<i>Lesquerella montana</i>	Mountain bladderpod	N		
<i>Nasturtium officinale</i>	watercress	E		
<i>Physaria bellii</i>	Bell's twinpod	N	Yes	G2G3 S2S3
<i>Sisymbrium altissimum</i>	Tumble mustard	E		
<i>Thlaspi arvense</i>	field pennycress	E		
<b>Family - Cactaceae</b>				
<i>Echinocereus viridiflorus</i>	Hedgehog cactus	N		
<i>Escobaria missouriensis</i>	Missouri nipple cactus	N		
<i>Oputia fragilis</i>	brittle pricklypear	N		
<i>Opuntia macrorhiza</i>	Twistspine prickly pear	N		
<i>Opuntia polyacantha</i>	Prickly pear cactus	N		
<i>Pediocactus simpsonii</i> var. <i>minor</i>	Mountain ball cactus	N		
<b>Family - Callitrichaceae</b>				
<i>Callitriche heterophylla</i>	twoheaded water starwort	N	Yes	G5 S1

Species Name	Common Name	Origin	Species of Interest List*	Ranking of CNHP Tracked Species**
<b>Family - Campanulaceae</b>				
<i>Campanula rotundifolia</i>	harebell	N		
<i>Triodanis perfoliata</i>	clasping Venus' looking-glass	N	Yes	G5 SNR
<b>Family - Cannabaceae</b>				
<i>Humulus lupulus</i> var. <i>neomexicanus</i>	wild hops	N	Yes	G5 SNR
<b>Family - Capparaceae</b>				
<i>Polanisia dodecandra</i>	clammyweed	N		
<b>Family - Caprifoliaceae</b>				
<i>Symphoricarpos occidentalis</i>	Western snowberry	N		
<b>Family - Caryophyllaceae</b>				
<i>Cerastium arvense</i> ssp. <i>strictum</i>	Field chickweed	N		
<i>Cerastium fontanum</i> ssp. <i>vulgare</i>	big chickweed	E		
<b>Family - Chenopodiaceae</b>				
<i>Atriplex canescens</i>	Fourwing saltbush	N		
<i>Bassia scoparia</i>	Kochia	E		
<i>Salsola tragus</i>	Russian-thistle	E		
<b>Family - Commelinaceae</b>				
<i>Tradescantia occidentalis</i>	Spiderwort	N		
<b>Family - Convolvulaceae</b>				
<i>Convolvulus arvensis</i>	Field bindweed	E		
<i>Evolvulus nuttallianus</i>	Shaggy dwarf morning glory	N		
<b>Family - Crassulaceae</b>				
<i>Sedum lanceolatum</i>	stonecrop	N		
<b>Family - Cyperaceae</b>				
<i>Carex deweyana</i> var. <i>deweyana</i>	Dewey sedge	N		
<i>Carex duriuscula</i>	needleleaf sedge	N		
<i>Carex emoryi</i>	Emory's sedge	N		
<i>Carex geyeri</i>	Geyer's sedge	N		
<i>Carex nebrascensis</i>	Nebraska sedge	N		
<i>Carex pachystachya</i>	chamisso sedge	N		
<i>Carex praticola</i>	meadow sedge	N		
<i>Carex sprengei</i>	Sprengel's sedge	N	Yes	G5 S2
<i>Cyperus lupulinus</i>	Great Plains flatsedge	N	Yes	G5 SNR
<i>Cyperus squarrosus</i>	bearded flatsedge	N	Yes	G5 SNR
<i>Eleocharis palustris</i>	Spike-rush	N		
<i>Eleocharis macrostachya</i>				
<i>Lipocarpa aristulata</i>	Smallflower halfchaff sedge	N	Yes	G5 SNR

Species Name	Common Name	Origin	Species of Interest List*	Ranking of CNHP Tracked Species**
<b>Family - Cyperaceae</b>				
<i>Schoenoplectus tabernaemontani</i>	softstem bulrush	N		
<i>Scirpus microcarpus</i>	panicled bulrush	N		
<i>Scirpus pallidus</i>	cloaked bulrush	N		
<b>Family - Ericaceae</b>				
<i>Arctostaphylos uva-ursi</i>	kinnikinnick	N		
<b>Family - Euphorbiaceae</b>				
<i>Chamaesyce serpens</i>	matted sandmat	E		
<i>Euphorbia brachycera</i>	Horned spurge	N		
<i>Euphorbia esula</i>	Leafy spurge	E		
<i>Tragia ramosa</i>	Branched noseburn	N		
<b>Family - Fabaceae</b>				
<i>Astragalus crassicaarpus</i>	Ground plum	N		
<i>Astragalus drummondii</i>	Drummond's milkvetch	N		
<i>Dalea candida</i> var. <i>oligophylla</i>	White prairie clover	N		
<i>Dalea purpurea</i>	Purple prairie clover	N		
<i>Glycyrrhiza lepidota</i>	Wild licorice	N		
<i>Medicago lupulina</i>	Black medic	E		
<i>Medicago sativa</i>	Alfalfa	E		
<i>Melilotus officinalis</i>	White sweet clover	E		
<i>Melilotus officinalis</i>	Yellow sweet clover	E		
<i>Oxytropis lambertii</i>	Locoweed	N		
<i>Oxytropis sericea</i>	White locoweed	N		
<i>Psoralidium tenuiflorum</i>	Slimflower scurfpea	N		
<i>Thermopsis divaricarpa</i>	Golden banner	N		
<i>Vicia americana</i>	American vetch	N		
<b>Family - Fumariaceae</b>				
<i>Corydalis aurea</i>	Golden corydalis	N		
<b>Family - Geraniaceae</b>				
<i>Erodium cicutarium</i>	Storksbill	E		
<i>Geranium caespitosum</i> var. <i>caespitosum</i>	Common wild geranium	N		
<b>Family - Grossulariaceae</b>				
<i>Ribes aureum</i>	Golden currant	N		
<i>Ribes cereum</i>	Wax currant	N		
<b>Family - Iridaceae</b>				
<i>Iris missouriensis</i>	Rocky Mountain iris	N		
<i>Sisyrinchium montanum</i>	blue-eyed grass	N		

Species Name	Common Name	Origin	Species of Interest List*	Ranking of CNHP Tracked Species**
<b>Family - Juncaceae</b>				
<i>Juncus drummondii</i>	Drummond's rush	N		
<i>Juncus dudleyi</i>	Dudley's rush	N		
<i>Juncus effusus</i>	common rush	E		
<i>Juncus nevadensis</i>	Sierra rush	N		
<b>Family - Lamiaceae</b>				
<i>Monarda fistulosa</i> ssp. <i>fistulosa</i> var. <i>menthifolia</i>	Beebalm	N		
<i>Monarda pectinata</i>	Pony beebalm	N		
<b>Family - Lamiaceae</b>				
<i>Nepeta cataria</i>	Catnip	E		
<i>Salvia reflexa</i>	lanceleaf sage	E		
<i>Scutellaria brittonii</i>	Skullcap	N		
<b>Family - Lemnaceae</b>				
<i>Lemna minor</i>	common duckweed	N		
<b>Family - Liliaceae</b>				
<i>Allium textile</i>	Wild onion	N		
<i>Asparagus officinalis</i>	Asparagus	E		
<i>Calochortus gunnisonii</i>	Mariposa lily	N		
<i>Leucocrinum montanum</i>	Sandlily	N		
<i>Zigadenus venenosus</i> var. <i>venenosus</i>	Meadow deathcamas	N		
<b>Family - Linaceae</b>				
<i>Linum lewisii</i> var. <i>lewisii</i>	Blue flax	N		
<b>Family - Loasaceae</b>				
<i>Mentzelia decapetala</i>	Ten petal mentzelia	N		
<i>Mentzelia oligosperma</i>	chickenthiel	N		
<i>Mentzelia speciosa</i>	Jeweled blazingstar	N	Yes	G3 S3
<b>Family - Malvaceae</b>				
<i>Sphaeralcea coccinea</i>	Scarlet globemallow	N		
<b>Family - Moraceae</b>				
<i>Morus alba</i>	white mulberry	E		
<b>Family - Oleaceae</b>				
<i>Fraxinus pennsylvanica</i>	green ash	E		
<b>Family - Onagraceae</b>				
<i>Gaura coccinea</i>	Scarlet gaura	N		
<i>Gaura mollis</i>	velvetweed	N		
<i>Oenothera albicaulis</i>	Whitest evening primrose	N		
<i>Oenothera caespitosa</i> ssp. <i>caespitosa</i>	Tufted evening primrose	N		

Species Name	Common Name	Origin	Species of Interest List*	Ranking of CNHP Tracked Species**
<b>Family - Onagraceae</b>				
<i>Oenothera coronipifolia</i>	Crown-leaf evening primrose	N		
<i>Oenothera howardii</i>	Howard's evening primrose	N		
<i>Oenothera villosa</i>	Hairy evening primrose	N		
<b>Family - Orobanchaceae</b>				
<i>Orobanche fasciculata</i>	clustered broomrape	N		
<b>Family - Oxalidaceae</b>				
<i>Oxalis dillenii</i>	slender yellow woodsorrel	N		
<b>Family - Papaveraceae</b>				
<i>Argemone polyanthemos</i>	Prickly poppy	N		
<b>Family - Plantaginaceae</b>				
<i>Plantago patagonica</i>	Woolly plantain	N		
<b>Family - Poaceae</b>				
<i>Achnatherum hymenoides</i>	Indian ricegrass	N		
<i>Achnatherum scribneri</i>	Scribner's needlegrass	N		
<i>Agropyron cristatum</i>	Crested wheatgrass	E		
<i>Agrostis stolonifera</i>	Redtop bent	E		
<i>Andropogon gerardii</i>	Big bluestem	N		
<i>Aristida purpurea</i>	Purple threeawn	N		
<i>Bouteloua curtipendula</i>	Sideoats grama	N		
<i>Bouteloua dactyloides</i>	Buffalograss	N		
<i>Bouteloua gracilis</i>	Blue grama	N		
<i>Bromus arvensis</i>	Field brome	E		
<i>Bromus inermis</i> ssp. <i>inermis</i> var. <i>inermis</i>	Smooth brome	E		
<i>Bromus tectorum</i>	Cheatgrass	E		
<i>Dactylis glomerata</i>	Orchardgrass	E		
<i>Danthonia parryi</i>	Parry's oatgrass	N		
<i>Dichanthelium oligosanthes</i> var. <i>scribnerianum</i>	Scribner's rosette grass	N		
<i>Echinochloa crus-galli</i>	Barnyardgrass	E		
<i>Elymus canadensis</i>	Canada wildrye	N		
<i>Elymus elymoides</i>	Bottlebrush squirreltail	N		
<i>Elymus repens</i>	quackgrass	E		
<i>Hesperostipa comata</i>	Needle-n-thread	N		
<i>Hesperostipa neomexicana</i>	New Mexico feathergrass	N		
<i>Hordeum jubatum</i> ssp. <i>jubatum</i>	Foxtail barley	N		
<i>Koeleria macrantha</i>	Prairie junegrass	N		
<i>Leucopoa kingii</i>	spike fescue	N		

Species Name	Common Name	Origin	Species of Interest List*	Ranking of CNHP Tracked Species**
<b>Family - Poaceae</b>				
<i>Muhlenbergia wrightii</i>	spike muhly	N		
<i>Nassella viridula</i>	Green needlegrass	N		
<i>Panicum capillare</i>	Witchgrass	E		
<i>Panicum virgatum</i>	Switchgrass	N		
<i>Pascopyrum smithii</i>	Western wheatgrass	N		
<i>Phalaris arundinacea</i>	Reed canarygrass	E		
<i>Phleum pratense</i>	Timothy	E		
<i>Poa pratensis</i>	Kentucky bluegrass	E		
<i>Schedonnardus paniculatus</i>	Tumblegrass	N		
<i>Schizachyrium scoparium</i>	Little bluestem	N		
<i>Sporobolus compositus</i>	composite dropseed	N		
<i>Sporobolus cryptandrus</i>	Sand dropseed	N		
<i>Thinopyrum intermedium</i>	intermediate wheatgrass	E		
<i>Thinopyrum ponticum</i>	tall wheatgrass	E		
<i>Vulpia octoflora</i>	sixweeks fescue	N		
<b>Family - Polemoniaceae</b>				
<i>Ipomopsis spicata</i>	Spiked ipomopsis	N		
<b>Family - Polygonaceae</b>				
<i>Eriogonum alatum</i>	Winged eriogonum	N		
<i>Eriogonum effusum</i>	Spreading buckwheat	N		
<i>Eriogonum umbellatum</i>	Sulphur flower	N		
<i>Polygonum convolvulus</i> var. <i>convolvulus</i>	black bindweed	E		
<i>Polygonum lapathifolium</i>	curlytop knotweed	E		
<i>Polygonum persicaria</i>	spotted ladysthumb	E		
<i>Rumex crispus</i>	Curly dock	E		
<b>Family - Potamogetonaceae</b>				
<i>Potamogeton nodosus</i>	longleaf pondweed	N		
<b>Family - Ranunculaceae</b>				
<i>Clematis ligusticifolia</i>	Western virgin's bower	N		
<i>Delphinium carolinianum</i> subsp. <i>virescens</i>	Carolina larkspur	N		
<i>Delphinium geyeri</i>	Larkspur	N		
<i>Delphinium nuttallianum</i>	Two lobe larkspur	N		
<i>Myosurus minimus</i>	tiny mousetail	N		
<i>Pulsatilla patens</i> ssp. <i>multifida</i>	pasque flower	N		



Species Name	Common Name	Origin	Species of Interest List*	Ranking of CNHP Tracked Species**
<b>Family - Rosaceae</b>				
<i>Cercocarpus montanus</i>	Mountain mahogany	N		
<i>Potentilla fissa</i>	bigflower cinquefoil	N		
<i>Potentilla norvegica</i>	Norwegian cinquefoili	E		
<i>Prunus americana</i>	Wild plum	N		
<i>Prunus virginiana</i> var. <i>melanocarpa</i>	Chokecherry	N		
<i>Rosa woodsii</i>	Wood's rose	N		
<i>Rubus deliciosus</i>	Boulder raspberry	N		
<i>Rubus idaeus</i> ssp. <i>strigosus</i>	red raspberry	N		
<b>Family - Rubiaceae</b>				
<i>Galium aparine</i>	stickywilly	N		
<b>Family - Salicaceae</b>				
<i>Populus X acuminata</i>	Lanceleaf cottonwood	N		
<i>Populus angustifolia</i>	Narrowleaf cottonwood	N		
<i>Populus deltoides</i> ssp. <i>monilifera</i>	Plains cottonwood	N		
<i>Populus tremuloides</i>	quaking aspen	N		
<i>Salix amygdaloides</i>	Peach-leaf willow	N		
<i>Salix exigua</i>	Coyote willow	N		
<i>Salix fragilis</i>	crack willow	E		
<b>Family - Santalaceae</b>				
<i>Comandra umbellata</i>	Pale bastard toadflax	N		
<b>Family - Saxifragaceae</b>				
<i>Heuchera parvifolia</i>	Littleleaf alumroot	N		
<b>Family - Scrophulariaceae</b>				
<i>Linaria dalmatica</i> ssp. <i>dalmatica</i>	Dalmatian toadflax	E		
<i>Mimulus floribundus</i>	manyflowered monkeyflower	N		
<i>Nuttallanthus texanus</i>	blue toadflax	N		
<i>Penstemon angustifolius</i>	broadbeard beardtongue	N		
<i>Penstemon secundiflorus</i>	Sidebells penstemon	N		
<i>Penstemon unilateralis</i>	oneside penstemon	N		
<i>Penstemon virens</i>	Front Range penstemon	N		
<i>Scrophularia lanceolata</i>	figwort	N		
<i>Verbascum thapsus</i>	Common mullein	E		
<i>Veronica anagallis-aquatica</i>	water speedwell	N		
<b>Family - Solanaceae</b>				
<i>Physalis heterophylla</i>	Clammy groundcherry	N		
<i>Physalis virginiana</i>	Virginia groundcherry	N		

Species Name	Common Name	Origin	Species of Interest List*	Ranking of CNHP Tracked Species**
<b>Family - Solanaceae</b>				
<i>Quincula lobata</i>	Chinese lantern	N		
<b>Family - Ulmaceae</b>				
<i>Celtis laevigata var. reticulata</i>	netleaf hackberry	N		
<i>Ulmus pumila</i>	Siberian elm	E		
<b>Family - Verbenaceae</b>				
<i>Verbena bracteata</i>	Big bract verbena	E		
<b>Family - Violaceae</b>				
<i>Viola nuttallii</i>	Nuttall's viola	N		
<b>Family - Vitaceae</b>				
<i>Parthenocissus vitacea</i>	Vinginia creeper	N		

**Sources/Notes**

Compiled from surveys by Crystal Strouse 2011-present. Nomenclature follows USDA Plants National Database. USDA, NRCS. 2015. The PLANTS Database (<http://plants.usda.gov>, 25 February 2015). National Plant Data Team, Greensboro, NC 27401-4901 USA.

\*City of Fort Collins Natural Areas Department Species of Interest List (September 2016).

\*\*Ranking List Details Provided by Colorado Natural Heritage Program Conservation Status Handbook (Tracking Lists), Vascular Plants. Colorado State University.

## Appendix B. Documented Species List: Wildlife

Common Name	Scientific Name
<b>MAMMALS</b>	
<b>Abert's squirrel</b>	<b><i>Sciurus aberti</i></b>
Badger	<i>Taxidea taxus</i>
Big brown bat	<i>Eptesicus fuscus</i>
<b>Bighorn sheep</b>	<b><i>Ovis canadensis</i></b>
Black bear	<i>Ursus americanus</i>
<b>Black-tailed prairie dog</b>	<b><i>Cynomys ludovicianus</i></b>
Chipmunk	<i>Tamias sp.</i>
Bobcat	<i>Lynx rufus</i>
Coyote	<i>Canis latrans</i>
Deer mouse	<i>Peromyscus maniculatus</i>
(Eastern) cottontail	<i>Sylvilagus sp.</i>
Elk	<i>Cervus elaphus, Cervus Canedensis</i>
Fox squirrel	<i>Sciurus niger</i>
Grey fox	<i>Urocyon cinereoargenteus</i>
Hispid pocket mouse	<i>Chaetodipus hispidus</i>
<b>Hoary bat</b>	<b><i>Lasiurus cinereus</i></b>
Little brown bat	<i>Myotis lucifugus</i>
Long-legged myotis	<i>Myotis volans</i>
Long-tailed vole	<i>Microtus longicaudus</i>
Mexican woodrat	<i>Neotoma mexicana</i>
Moose	<i>Alces alces</i>
Mountain lion	<i>Puma concolor</i>
Mule deer	<i>Odocoileus hemionus</i>
Northern rock mouse	<i>Peromyscus nasutus</i>
Pocket Gopher	<i>Geomyidae spp.</i>
Prairie vole	<i>Microtus ochrogaster</i>
<b>Preble's meadow jumping mouse</b>	<b><i>Zapus hudsonius preblei</i></b>
Raccoon	<i>Procyon lotor</i>
Red fox	<i>Vulpes vulpes</i>
Rock squirrel	<i>Otospermophilus variegatus</i>
Silver-haired bat	<i>Lasionycteris noctivagans</i>
Striped skunk	<i>Mephitis mephitis</i>
<b>Townsend's big-eared bat</b>	<b><i>Corynorhinus townsendii</i></b>
Western harvest mouse	<i>Reithrodontomys megalotis</i>
western long-eared myotis	<i>Myotis evotis</i>
Western small-footed myotis	<i>Myotis ciliolabrum</i>
Western spotted skunk	<i>Spilogale gracilis</i>
Yellow-bellied marmot	<i>Marmota flaviventris</i>

<b>Common Name</b>	<b>Scientific Name</b>
<b>BIRDS</b>	
American crow	<i>Corvus brachyrhynchos</i>
American dipper	<i>Cinclus mexicanus</i>
American goldfinch	<i>Carduelis tristis</i>
American kestrel	<i>Falco tinnunculus</i>
American robin	<i>Turdus migratorius</i>
American tree sparrow	<i>Spizelloides arborea</i>
American white pelican	<i>Pelecanus erythrorhynchos</i>
American woodcock (M,U)	<i>Scolopax minor</i>
Ash-throated flycatcher	<i>Myiarchus cinerascens</i>
Bald eagle (SC)	<i>Haliaeetus leucocephalus</i>
Barn swallow	<i>Riparia riparia</i>
Belted kingfisher	<i>Ceryle alcyon</i>
Black-and-white warbler (U)	<i>Mniotilta varia</i>
Black-billed magpie	<i>Pica pica</i>
Black-capped chickadee	<i>Parus atricapillus</i>
Black-chinned hummingbird (U)	<i>Archilochus alexandri</i>
Black-headed grosbeak	<i>Pheucticus melanocephalus</i>
Blue grosbeak	<i>Guiraca caerulea</i>
Blue jay	<i>Cyanocitta cristata</i>
Blue-gray gnatcatcher	<i>Polioptila caerulea</i>
Brewer's blackbird	<i>Euphagus cyanocephalus</i>
<b>Brewer's sparrow</b>	<b><i>Spizella breweri</i></b>
Broad-tailed hummingbird	<i>Selasphorus platycercus</i>
Broad-winged hawk (U)	<i>Buteo platypterus</i>
Brown creeper	<i>Certhia americana</i>
Brown thrasher (U)	<i>Toxostoma rufum</i>
Brown-headed cowbird	<i>Molthrus ater</i>
Bullock's oriole	<i>Icterus galbula</i>
<b>Burrowing owl (ST)</b>	<b><i>Athene cunicularia</i></b>
Bushtit (U)	<i>Psaltiparus minimus</i>
Calliope hummingbird	<i>Selasphorus calliope</i>
Canada goose	<i>Branta canadensis</i>
Canyon wren	<i>Catherpes mexicanus</i>
<b>Cassin's finch</b>	<b><i>Peucaea cassinii</i></b>
Cassin's kingbird (U)	<i>Tyrannus vociferans</i>
Cedar waxwing	<i>Bombcilla cedrorum</i>
Chipping sparrow	<i>Spizella passerina</i>
Cinnamon teal	<i>Anas cyanoptera</i>
Clark's nutcracker (U)	<i>Nucifraga columbiana</i>
Clay-colored sparrow	<i>Spizella pallida</i>

<b>Common Name</b>	<b>Scientific Name</b>
<b>BIRDS</b>	
Cliff swallow	<i>Hirundo pyrrhonota</i>
Common goldeneye	<i>Bucephala clangula</i>
Common grackle	<i>Quiscalus quiscula</i>
Common merganser	<i>Mergus merganser</i>
Common nighthawk	<i>Chordeiles minor</i>
Common raven	<i>Corvus corax</i>
Common redpoll	<i>Carduelis flammea</i>
Common yellowthroat	<i>Geothlypis trichas</i>
Cooper's hawk	<i>Accipiter cooperii</i>
Cordilleran flycatcher	<i>Empidonax occidentalis</i>
Dark-eyed junco	<i>Junco hyemalis</i>
Dickcissel (U)	<i>Spiza americana</i>
Double-crested cormorant	<i>Phalacrocorax auritus</i>
Downy woodpecker	<i>Picoides pubescens</i>
Dusky flycatcher	<i>Empidonax oberholseri</i>
Dusky grouse	<i>Dendragapus obscurus</i>
Eastern bluebird (U)	<i>Sialia sialis</i>
Eastern kingbird	<i>Tyrannus tyrannus</i>
Eastern wood-pewee	<i>Contopus virens</i>
Eurasian collared-dove (I)	<i>Streptopelia decaocto</i>
European starling (I)	<i>Sturnus vulgaris</i>
Evening grosbeak	<i>Coccothraustes vespertinus</i>
<b>Ferruginous hawk</b>	<b><i>Buteo regalis</i></b>
<b>Golden eagle</b>	<b><i>Aquila chrysaetos</i></b>
Golden-crowned kinglet	<i>Regulus satrapa</i>
<b>Grasshopper sparrow (U)</b>	<b><i>Ammodramus savannarum</i></b>
Gray catbird	<i>Dumetella carolinensis</i>
Gray flycatcher (U)	<i>Empidonax wrightii</i>
Great blue heron	<i>Ardea herodias</i>
Great horned owl	<i>Bubo virginianus</i>
Green-tailed towhee	<i>Pipilo chlorurus</i>
Hairy woodpecker	<i>Picoides villosus</i>
Hammond's flycatcher	<i>Empidonax hammondii</i>
Horned lark	<i>Eremophila alpestris</i>
House finch	<i>Carpodacus cassinii</i>
House sparrow (I)	<i>Passer domesticus</i>
House wren	<i>Troglodytes aedon</i>
Indigo bunting	<i>Passerina cyanea</i>
Killdeer	<i>Charadrius vociferus</i>
<b>Lark bunting</b>	<b><i>Calamospiza melanocorys</i></b>

<b>Common Name</b>	<b>Scientific Name</b>
<b>BIRDS</b>	
Lark sparrow	<i>Chondestes grammacus</i>
<b>Lazuli bunting</b>	<b><i>Passerina amoena</i></b>
Least flycatcher	<i>Empidonax minimus</i>
Lesser goldfinch	<i>Carduelis psaltria</i>
<b>Lewis's woodpecker</b>	<b><i>Melanerpes lewis</i></b>
Lincoln's sparrow	<i>Melospiza lincolni</i>
<b>Loggerhead shrike</b>	<b><i>Lanius ludovicianus</i></b>
Long-eared owl (U)	<i>Asio otus</i>
MacGillivray's warbler	<i>Oporornis toimiel</i>
Magnolia warbler (U)	<i>Setophaga magnolia</i>
Mallard	<i>Anas platyrhynchos</i>
Merlin	<i>Falco columbarius</i>
Mountain bluebird	<i>Sialia currucoides</i>
Mountain chickadee	<i>Parus gambel</i>
Mourning dove	<i>Zenaida macroura</i>
Northern flicker	<i>Colaptes auratus</i>
<b>Northern goshawk</b>	<b><i>Accipiter gentilis</i></b>
<b>Northern harrier</b>	<b><i>Circus cyaneus</i></b>
Northern mockingbird	<i>Mimus polyglottos</i>
<b>Northern pygmy-owl</b>	<b><i>Glaucidium gnoma</i></b>
Northern rough-winged swallow	<i>Stelgidopteryx serripennis</i>
Northern shrike	<i>Lanius excubitor</i>
Orange-crowned warbler	<i>Oreothlypis celata</i>
Peregrine falcon	<i>Falco peregrinus</i>
Pine siskin	<i>Carduelis pinus</i>
<b>Pinyon jay (U)</b>	<b><i>Gymnorhinus cyanocephalus</i></b>
Plumbeous vireo	<i>Vireo plumbeus</i>
<b>Prairie falcon</b>	<b><i>Falco mexicanus</i></b>
Pygmy nuthatch	<i>Sitta Pygmaea</i>
Red crossbill	<i>Loxia curvirostra</i>
Red-breasted nuthatch	<i>Sitta canadensis</i>
Red-headed woodpecker (U)	<i>Melanerpes erythrocephalus</i>
Red-naped sapsucker	<i>Sphyrapicus nuchalis</i>
Red-tailed hawk	<i>Buteo jamaicensis</i>
Red-winged blackbird	<i>Agelaius phoeniceus</i>
Ring-billed gull	<i>Larus delawarensis</i>
Rock pigeon (I)	<i>Columba livia</i>
Rock wren	<i>Salpinctes obsoletus</i>
Rough-legged hawk	<i>Buteo lagopus</i>
Ruby-crowned kinglet	<i>Regulus calendula</i>

<b>Common Name</b>	<b>Scientific Name</b>
<b>BIRDS</b>	
<b>Rufous hummingbird</b>	<b><i>Selasphorus rufus</i></b>
Sage thrasher	<i>Oreoscoptes montanus</i>
Savannah sparrow	<i>Passerculus sandwichensis</i>
Say's phoebe	<i>Sayornis saya</i>
Sharp-shinned hawk	<i>Accipiter striatus</i>
Song sparrow	<i>Melospiza melodia</i>
Spotted towhee	<i>Pipilo erythrophthalmus</i>
Stellar's jay	<i>Cyanocitta stelleri</i>
Swainson's thrush	<i>Catharus ustulatus</i>
<b>Swainson's hawk</b>	<b><i>Buteo swainsoni</i></b>
Townsend's warbler	<i>Setophaga townsendi</i>
Townsend's solitaire	<i>Myadestes townsendi</i>
Tree swallow	<i>Tachycineta bicolor</i>
Turkey vulture	<i>Cathartes aura</i>
Vesper sparrow	<i>Pooecetes gramineus</i>
Violet-green swallow	<i>Tachycineta thalassina</i>
<b>Virginia's warbler</b>	<b><i>Oreothlypis virginiae</i></b>
Warbling vireo	<i>Vireo gilvus</i>
Western bluebird	<i>Sialia mexicana</i>
Western kingbird	<i>Tyrannus verticalis</i>
Western meadowlark	<i>Sturnelia magna</i>
Western tanager	<i>Piranga ludoviciana</i>
Western wood-pewee	<i>Contopus sordidulus</i>
White-breasted nuthatch	<i>Sitta carolinensis</i>
White-crowned sparrow	<i>Zonotrichia leucophrys</i>
White-throated swift	<i>Aeronautes saxatalis</i>
White-winged crossbill (U)	<i>Loxia leucoptera</i>
Wild turkey	<i>Meleagris gallopavo</i>
Williamson's sapsucker	<i>Sphyrapicus thyroideus</i>
<b>Willow flycatcher</b>	<b><i>Empidonax traillii</i></b>
Wilson's snipe	<i>Gallinago delicata</i>
Wilson's warbler	<i>Willsonia pusilla</i>
Winter wren	<i>Troglodytes hiemalis</i>
Woodhouse's scrub-jay (U)	<i>Aphelocoma woodhouseii</i>
Yellow warbler	<i>Dendroica petechia</i>
Yellow-breasted chat	<i>Icteria virens</i>
Yellow-rumped warbler	<i>Dendroica coronata</i>
<b>AMPHIBIANS AND REPTILES</b>	
Bullsnake	<i>Pituophis catenifer</i>
Chorus frog	<i>Pseudacris triseriata</i>

<b>Common Name</b>	<b>Scientific Name</b>
<b>AMPHIBIANS AND REPTILES</b>	
Lesser earless lizard	<i>Holbrookia maculata</i>
Milk snake	<i>Lampropeltis triangulum</i>
Terrestrial Garter snake	<i>Thamnophis elegans</i>
Western rattlesnake	<i>Crotalus oreganus</i>
Woodhouse's toad	<i>Anazyrus woodhousii</i>
Yellow-bellied racer	<i>Coluber constrictor mormon</i>

**Bold font indicates species is on the Natural Areas Department Species of Interest List.**

**Sources**

Observations from Natural Areas Staff, data collected in reports for NAD, Fort Collins Audubon Society bird surveys, wildlife camera project, and the 2005 Bobcat Ridge Management Plan.



## Appendix C-a. Species List and Habitat Requirements for Documented Butterflies and Moths

Common Name	Scientific Name	Larval Plants	Larval Plants Present at BCR	Food Plants	Nectar Plants Present at BCR	Habitat
<b>Papilionidae - Parnissians and Swallowtails</b>						
Western Tiger Swallowtail	<i>Papilio rutulus</i>					
Anise Swallowtail	<i>Papilio zelicaon</i>	Many species of <i>Apiaceae</i> (Parsley Family) and some in <i>Rutaceae</i> (Citrus Family)	<i>Harbouria trachypleura</i> , <i>Lomatium orientale</i> and <i>Musineon divaricatum</i>	<i>Heracleum maximum</i> , <i>Harbouria trachypleura</i>	<i>Harbouria trachypleura</i>	Bare hills, mountains, gardens, fields, vacant lots, and roadsides.
<b>Pieridae - Whites and Sulphurs</b>						
Colorado Marble	<i>Euchloe ausonides coloradensis</i>	<i>Arabis drummondii</i> , <i>Sisymbrium</i> spp. and other plants in the <i>Brassicaceae</i> (Mustard Family)	<i>Sisymbrium altissimum</i> , <i>Arabis glabra</i> , <i>Lesquerella montana</i> , and, <i>Physaria bellii</i>	Plants in <i>Brassicaceae</i> (Mustard Family), and <i>Amsinckia</i> spp.	<i>Arabis glabra</i> , <i>Lesquerella montana</i> , and, <i>Physaria bellii</i>	Valleys, hillsides, fields, meadows, and other open sunny areas.
Colorado White	<i>Pontia sisymbrii elivata</i>	Plants in the <i>Brassicaceae</i> (Mustard Family) including <i>Sisymbrium</i> spp., <i>Arabis</i> spp., <i>Descurainia</i> spp.	<i>Sisymbrium altissimum</i> , <i>Arabis glabra</i> , <i>Descurainia pinnata</i> ssp. <i>brachycarpa</i> , <i>Descurainia sophia</i>	<i>Arabis</i> spp., and other native mustards.	<i>Arabis glabra</i> , <i>Lesquerella montana</i> , and, <i>Physaria bellii</i>	Dry slopes, rocky canyons, outcrops, roadsides, and open coniferous forests.
<b>Lycaenidae- Gossamer-wing Butterflies</b>						
Western Pine Elfin	<i>Callophrys eryphon eryphon</i>	Young needles of pines including <i>Pinus contorta</i> , <i>P. flexilis</i> , and <i>P. ponderosa</i>	<i>Pinus ponderosa</i> var. <i>scopulorum</i>	Flower nectar	Many species of nectar plants.	Pine forests.

Common Name	Scientific Name	Larval Plants	Larval Plants Present at BCR	Food Plants	Nectar Plants Present at BCR	Habitat
<b>Lycaenidae- Gossamer-wing Butterflies</b>						
Moss's Elphin	<i>Callophrys mossi schryveri</i>	<i>Sedum</i> spp. and other species in <i>Crassulaceae</i> (Stonecrop Family)	<i>Sedum lanceolatum</i>	Not reported	NA	Rocky outcrops, woody canyons, and cliffs.
Sheridan's Green Hairstreak	<i>Callophrys sheridanii sheridanii</i>	Various <i>Eriogonum</i> spp.	<i>Eriogonum alatum</i> , <i>Eriogonum effusum</i> and <i>Eriogonum umbellatum</i>	Flower nectar	Many species of nectar plants.	Woodlands.
Silvery Blue	<i>Glaucopsyche lygdamus</i>	<i>Astragalus</i> spp., <i>Lotus</i> spp., <i>Lupinus</i> spp., <i>Melilotus</i> spp., <i>Oxytropis</i> spp., <i>Lathyrus</i> spp. <i>Vicia</i> spp. and other species in <i>Fabaceae</i> (Pea Family)	<i>Astragalus crassicaarpus</i> , <i>Astragalus drummondii</i> , <i>Oxytropis lambertii</i> , <i>Oxytropis sericea</i> and <i>Vicia americana</i>	Nectar from flowers in <i>Asteraceae</i> (Sunflower Family)	Many species in <i>Asteraceae</i> (Sunflower Family)	Open woods, prairies, meadows, and road edges.
Melissa Blue	<i>Lycaeides melissa</i>	Various legumes in <i>Fabaceae</i> (Pea Family) including <i>Astragalus</i> spp., <i>Glycyrrhiza</i> spp., <i>Lotus</i> spp., <i>Lupinus</i> spp. and <i>Medicago</i> spp.	<i>Astragalus crassicaarpus</i> , <i>Astragalus drummondii</i> , <i>Glycyrrhiza lepidota</i> , <i>Medicago lupulina</i> and <i>Medicago sativa</i>	Not reported	NA	Weedy areas and prairies.
Boisduval's Blue	<i>Plebejus icariodes</i>	Various <i>Lupinus</i> spp.	Not Found	Nectar from various <i>Eriogonum</i> spp. and composites.	<i>Eriogonum alatum</i> , <i>Eriogonum effusum</i> , <i>Eriogonum umbellatum</i> , and many species in <i>Asteraceae</i> (Sunflower Family)	Forest clearings, fields, and prairie.

Common Name	Scientific Name	Larval Plants	Larval Plants Present at BCR	Food Plants	Nectar Plants Present at BCR	Habitat
<b>Nymphalidae - Brush-footed Butterflies</b>						
Gorgone Checkerspot	<i>Chlosyne gorgone</i>	Several plants in <i>Asteraceae</i> (Sunflower Family) including <i>Helianthus</i> spp. and <i>Lysimachia</i> spp. In the <i>Primulaceae</i> (Primrose Family)	<i>Helianthus annuus</i> and <i>Helianthus pumilus</i>	Nectar, especially from yellow flowers.	Many species of plants with yellow flowers.	Open areas including ridges, prairies, streamsides, old fields, and forest edges.
Mourning Cloak	<i>Nymphalis antiopa</i>	<i>Salix</i> spp., <i>Ulmus americana</i> , <i>Populus deltoides</i> , <i>Populus tremuloides</i> , <i>Betula papyrifera</i> , and <i>Celtis occidentalis</i> .	<i>Populus deltoides</i> , <i>Salix amygdaloides</i> , <i>Salix exigua</i> , and <i>Celtis laevigata</i> var. <i>reticulata</i> .	Prefer tree sap, especially <i>Quercus</i> spp. Also feed on rotting fruit.	<i>Prunus americana</i> , <i>Prunus virginiana</i> var. <i>melanocarpa</i> , <i>Rosa woodsii</i> , <i>Rubus deliciosus</i> and <i>Rubus idaeus</i> ssp. <i>strigosus</i>	Woods, parks, and riparian areas.
Milbert's Tortoise Shell	<i>Nymphalis milberti</i>	<i>Urtica dioica</i> and <i>U. procera</i>	Not Found	<i>Cirsium</i> spp., <i>Solidago</i> spp., and rotting fruit and sap.	<i>Cirsium flodmanii</i> , and <i>Cirsium undulatum</i>	Wet areas near woodlands, moist pastures, and marshes.
Field Crescent	<i>Phyciodes campestris</i>	Various <i>Aster</i> spp. and <i>Machaeranthera</i> spp.	<i>Machaeranthera pinnatifida</i>	Flower nectar.	Many species of nectar plants.	Flat and open areas.
Hoary Comma	<i>Polygonia gracilis</i>	<i>Ribes</i> spp.	<i>Ribes aureum</i> and <i>Ribes cereum</i>	Sap and nectar from <i>Gnaphalium</i> spp. among others.	<i>Gnaphalium palustre</i>	Foothills, woodland streamsides, and brushlands.
Aphrodite Fritillary	<i>Speyeria aphrodite</i>	Various violet species including <i>Viola fimbriatula</i> and <i>V. lanceolata</i>	<i>Viola nuttallii</i>	Nectar from milkweeds.	<i>Asclepias speciosa</i> , and <i>Asclepias virdiflora</i>	Prairies and high mountain meadows.

Common Name	Scientific Name	Larval Plants	Larval Plants Present at BCR	Food Plants	Nectar Plants Present at BCR	Habitat
<b>Nymphalidae - Brush-footed Butterflies</b>						
Painted Lady	<i>Vanessa cardui</i>	<i>Cirsium</i> spp., plants from <i>Malvaceae</i> (Mallow Family), and <i>Fabaceae</i> (Pea Family)	<i>Cirsium flodmanii</i> , <i>Cirsium undulatum</i> , <i>Sphaeralcea coccinea</i> (Mallow Family), 14 species in <i>Fabaceae</i> (Pea Family)	Prefers nectar from composites 3-6 feet high, especially <i>Cirsium</i> spp., <i>Aster</i> spp., <i>Liatris</i> spp., <i>Eutrochium maculatum</i> . Flowers from other families include <i>Trifolium pratense</i> , and <i>Asclepias</i> spp.	<i>Asclepias speciosa</i> , <i>Asclepias viridiflora</i> , <i>Cirsium flodmanii</i> , <i>Cirsium undulatum</i> , <i>Liatris punctata</i> , and 14 other species that are composites 3-6 feet high.	Almost everywhere, especially in open or disturbed areas.
<b>Hesperiidae- Skippers</b>						
Persius Duskywing Skipper	<i>Erynnis persius</i>	<i>Lupinus</i> spp., <i>Thermopsis</i> spp., <i>Lotus</i> spp. and other plants in <i>Fabaceae</i> (Pea Family)	<i>Thermopsis divaricarpa</i> and 13 other species in <i>Fabaceae</i> (Pea Family)	flower nectar	Many species of nectar plants.	Open areas including mountain grasslands, marshes, seeps, and streamsides.
Taxiles Skipper	<i>Poanes taxiles</i>	Grasses including <i>Poa</i> spp., <i>Agropyron</i> spp., <i>Dactylis</i> spp., <i>Elymus</i> spp., <i>Agrostis</i> spp.	<i>Pascopyrum smithii</i> , <i>Elymus canadensis</i> , <i>Elymus elymoides</i> and <i>Agrostis stolonifera</i>	flower nectar	Many species of nectar plants.	Woodland openings, stream valleys, forest meadows.
Common Checkered Skipper	<i>Pyrgus communis</i>	Several plants in the <i>Malvaceae</i> (mallow family) including <i>Sphaeralcea</i> spp., <i>Malva</i> spp., <i>Callirhoe</i> spp.	<i>Sphaeralcea coccinea</i>	Nectar from white-flowered composites <i>Erigeron</i> spp. Other plants include <i>Trifolium pratense</i> , and <i>Bidens</i> spp.	<i>Achillea millefolium</i> var. <i>occidentalis</i> , <i>Erigeron divergens</i> , <i>Erigeron flagellaris</i> , <i>Gnaphalium palustre</i> , <i>Symphytotrichum falcatum</i> var. <i>falcatum</i> , <i>Townsendia grandiflora</i> , and <i>Townsendia hookeri</i>	Open, sunny places with low vegetation and some bare soil.

## Appendix C-b. Species List and Habitat Requirements for Expected Butterflies and Moths

Common Name	Scientific Name	Larval Plants	Larval Plants Present at BCR	Nectar Plants	Nectar Plants Present at BCR	Habitat & Possible Improvements
<b>Lycaenidae - Gossamer-wing Butterflies</b>						
Hops Azure - May-June	<i>Celestrina humulus</i>	Larva feed mostly on male flowers of <i>Humulus lupulus</i> , and on flowers from the white flowered form of <i>Lupinus argenteus</i>	<i>Humulus lupulus</i> var. <i>neomexicanus</i>	flower nectar	Many species of flowers that provide nectar.	Riparian Shrubland. Could increase populations of <i>Humulus lupulus</i> var. <i>neomexicanus</i> and <i>Lupinus argenteus</i> in canyon areas, would also need to control exotics in area. Would be good to GPS hops population.
<b>Nymphalidae - Brush-footed Butterflies</b>						
Sandhill Fritillary	<i>Boloria selene sabulocollis</i>	Violets including <i>Viola glabella</i> and <i>V. nephrophylla</i>	<i>Viola nuttallii</i>	Asteraceae (Sunflower Family) including <i>Solidago</i> spp., <i>Rudbeckia hirta</i>	Many species in the Asteraceae (Sunflower Family).	Wet meadows, bogs, marshes. Restoration of valley area should include these nectar plants.
<b>Hesperiidae- Skippers</b>						
Simius Roadside Skipper -Mid May-July	<i>Amblyscirtes simius</i>	<i>Bouteloua gracilis</i>	<i>Bouteloua gracilis</i>	Nectar from a variety of flowers including <i>Penstemon</i> spp., <i>Cirsium</i> spp. and <i>Verbena</i> spp.	<i>Penstemon angustifolius</i> , <i>P. secundiflorus</i> , <i>P. unilateralis</i> , <i>P. virens</i> , <i>Cirsium flodmanii</i> , and <i>Cirsium undulatum</i>	Open pinyon-juniper woodland, shortgrass and mixed-grass prairie. Restoration of valley area should include these nectar plants.

Common Name	Scientific Name	Larval Plants	Larval Plants Present at BCR	Nectar Plants	Nectar Plants Present at BCR	Habitat & Possible Improvements
<b>Lycaenidae - Gossamer-wing Butterflies</b>						
Dusted Skipper	<i>Atrytonopsis hianna</i>	<i>Schizachyrium scoparium</i> , and <i>Androgogon gerardii</i>	<i>Schizachyrium scoparium</i> , and <i>Androgogon gerardii</i>	<i>Penstemon</i> spp.	<i>Penstemon angustifolius</i> , <i>P. secundiflorus</i> , <i>P. unilateralis</i> and <i>P. virens</i> .	Grasslands, and prairies. Restoration of valley area should include these nectar plants.
Mottled Dusky Wing Skipper	<i>Erynnis martialis</i>	Members of <i>Rhamnaceae</i> (Buckthorn Family) New Jersey tea <i>Ceanothus americanus</i> , <i>C. herbaceus</i> var. <i>pubescens</i> , <i>C. americanus</i> , <i>C. ovatus</i> and <i>C. fendleri</i> .	None Found	<i>Ceanothus</i> spp.	Likely present, none found yet	Open woodlands. Include species of <i>Ceanothus</i> in Mixed Grass and Mixed Foothills Forest restoration areas.
Cross-line Skipper	<i>Polites origenes</i>	<i>Schizachyrium scoparium</i> , and other grasses	<i>Schizachyrium scoparium</i> and 17 other species of grasses.	white, pink or purple flowers, <i>Trifolium pratense</i> (E), <i>Astragalus</i> spp., <i>Prunella vulgaris</i> , <i>Apocynum</i> spp., and <i>Ceanothus</i> spp.	<i>Apocynum cannabinum</i> , <i>Astragalus crassicaarpus</i> , <i>Astragalus drummondii</i> , and many other species featuring white, pink or purple flowers	Open grassy areas including prairies hills, power line cuts, old fields, forest openings. Could include nectar plants for this butterfly in valley restoration.
Rhesus Skipper May-June	<i>Polites rhesus</i>	<i>Bouteloua gracilis</i>	<i>Bouteloua gracilis</i>	Nectar from <i>Astragalus drummondii</i>	<i>Astragalus drummondii</i>	Native short-grass and mixed-grass prairie. May not be here because of the exotic grasses that occupy the niche for the native short and mixed grasses.

Common Name	Scientific Name	Larval Plants	Larval Plants Present at BCR	Nectar Plants	Nectar Plants Present at BCR	Habitat & Possible Improvements
<b>Lycaenidae - Gossamer-wing Butterflies</b>						
Morrison's Skipper	<i>Stinga morrisoni</i>	not listed	NA	flower nectar	Many species of flowers that provide nectar.	Grassy openings in Ponderosa pine, pinyon forest, and oak woodlands.

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