2014

Devil's Backbone Management Plan Update

LARIMER COUNTY
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Natural Resources

CONSERVATION AND RECREATION EXCELLENCE SINCE 1954

Adoption of the Resource Management and Implementation Plan for Devil's Backbone Open Space

The Resource Management and Implementation Plan for Devil's Backbone Open Space was recommended for adoption by the Larimer County Open Lands Advisory Board on January 22, 2015 and adopted by the Larimer County Manager and City of Fort Collins Manager.

Linda Hoffmann, Larimer County Manager — Date: 2-5-15

Darin Atteberry, Fort Collins City Manager — Date: 3/3/15

Approved as to form:

Assistant City Attorney

The Larimer County Natural Resources Department celebrated our 60th Anniversary in 2014. During this period, the help preserve open spaces sales tax was passed and one of the first open spaces we developed for public access was Devil's Backbone Open Space. Today, approximately 70,000 people per year visit the Backbone to hike, mountain bike and horseback ride. Devil's Backbone Open Space continues to be one of the most popular outdoor recreation areas near Loveland and we expect visitation to rise.

Devil's Backbone Open Space is popular because it provides something for everyone. The rock feature is a local icon and hundreds of students come from Larimer, Boulder and Weld counties to study the geology. The scenery and views from the open space are fantastic, whether you look west through the Keyhole feature or hike through Indian Creek valley. Wildlife is abundant and visitors are likely to see deer, golden eagles, songbirds, butterflies and flowering plants throughout the open space. Hikers rave about these natural features and mountain bikers love to ride the technical terrain through Laughing Horse Loop or the gentle sections along the north end of the Blue Sky Trail.

These are the natural features and trail experiences that make Devil's Backbone special. However, increasing visitation can compromise the visitor experience and lead to declining natural and cultural resource values. These concerns prompted this update to the Devil's Backbone Management Plan.

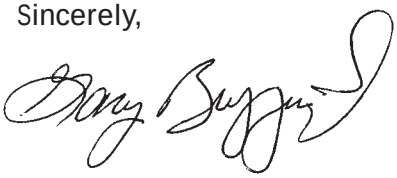
This management planning process took nearly 12 months to complete and involved four public meetings, the formation of a Technical Advisory Committee composed of representatives from partner agencies, recreation groups, historians, geologists, and wildlife and ecology experts and others. Over a hundred comments were collected and tough decisions were made. Ultimately, this update will ensure that the resources are protected and the experiences visitors had during the first 15 years of Devil's Backbone Open Space will continue for the next 15.

The major changes you'll see in this plan include:

- Designation of the Wild Loop Trail as foot-traffic only, to reduce trail congestion
- Development of a new multi-use trail through Hidden Valley, designed for mountain bikers and equestrians
- Reconfiguration of the trailhead, to more safely accommodate parking and improve visitor experience

Thank you for taking an interest in Devil's Backbone Open Space. Larimer County is proud to manage the Backbone in a manner that protects natural resources and provides exceptional outdoor recreation opportunities.

Sincerely,



Gary Buffington

Director

Larimer County Natural Resources Department

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I. Planning Process

1.1 Purpose of Plan Update

The foothills between the Big Thompson and Poudre Rivers have been a conservation and recreation priority for public agencies since the 1950s after Horsetooth Reservoir was built. The Devil's Backbone rock outcrop was identified in variety of plans in the 1990s as a candidate for conservation. The majority of the rock outcrop and parcels in the surrounding valleys were acquired by Larimer County, the City of Fort Collins and the City of Loveland in several phases between1998 and 2003.

Photo by Mark Yoder

The first management plan for the 2,663-acre Devil's Backbone Open Space was written and adopted in 1999 and updated in 2004. Those plans outlined a series of implementation steps addressing wildlife management, protecting grassland and shrubland health, managing the rock outcrop, trails, parking, education and cultural resources. The plan ensured the protection of sensitive natural and cultural resources and called for the construction of multi-use trails and a trailhead.

Visitation has increased since public access was permitted at Devil's Backbone Open Space and the facilities developed from the 2004 Management Plan are no longer adequate to support current use. The Wild Loop Trail is widening due to high visitation and users passing one another during peak hours. Parking demand often exceeds trailhead capacity, and wildlife, such as prairie falcons, that used to nest near the Keyhole have not nested in many years. An updated management plan is needed to accommodate existing recreation demand and protect the defining features and conservation values of the open space.

1.2 Management Vision and Plan Objectives

The purpose of land acquisition in the Devil's Backbone area was to protect the foothills mountain backdrop between Fort Collins and Loveland, the rock outcrop, the native and rare vegetation, the wildlife populations and to provide non-motorized outdoor recreational opportunities. Recreation demand has continued to rise and due to its proximity to urban areas and variety of recreation opportunities provided, Devil's Backbone Open Space is one of the premier outdoor recreation areas in Larimer County.

The following Management Vision was developed to succinctly capture the natural and cultural resource values and recreational significance of Devil's Backbone.

Devil's Backbone Management Vision

Devil's Backbone Open Space is a biologically rich hogback and valley system that includes striking rock formations, intact shrublands and grasslands, diverse wildlife species and provides for a variety of fulfilling outdoor recreation opportunities. Devil's Backbone Open Space is located near the City of Loveland and serves as one of the region's most popular outdoor recreation destinations. Management activities will balance outdoor recreation use with natural and cultural resource protection.

Devil's Backbone Management Plan Objectives

- Protect, manage and enhance natural, cultural and visual resources including maintaining and promoting healthy ecosystems and their processes
- Provide fulfilling non-motorized outdoor recreation opportunities that connect people to nature, are safe and minimize impacts to natural, cultural and visual resources
- Provide fun and meaningful education opportunities regarding the values of the surrounding natural, cultural and visual resources
- Define management actions to fulfill the Management Vision and Plan objectives

1.3 Public and Agency Involvement

Larimer County has managed public access and resources at Devil's Backbone Open Space since 1999 and tens of thousands of visitors hike, bike and horseback ride the trails every year. Public input is vital to the update of the management plan and a combination of public engagement activities were developed throughout 2014 to ensure input was collected from a variety of open space users, property neighbors and stakeholders.

Technical Advisory Committee

A Technical Advisory Committee (TAC) of subject experts assembled to provide planning staff guidance in the development of the updated plan. TAC members attended a site visit to discuss site constraints and management opportunities and reviewed the draft management plan update.

External TAC Members

Ecology/Plants (Colorado Natural Heritage Program) ..... Pam Smith
Wildlife (Colorado Parks and Wildlife) ..... Clayton Brossart
Birds (Rocky Mountain Bird Observatory) ..... ErinYoungberg
Geology (CSU Geosciences) ..... Frank Ethridge
Geology (Stewart Environmental) ..... Paul Stone
History (Local Historian) ..... Ken Jessen
Mountain Biking (Overland Mountain Bike Club) ..... Todd Thibodeau
Mountain Biking (Overland Mountain Bike Club) ..... Marty Malenshek
Horseback Riding (Larimer County Horseman's Association) ..... Joe Andrews
City of Fort Collins (Natural Areas Department) ..... Daylan Figgs
City of Loveland (Loveland Open Lands Program) ..... Brian Hayes
Trailhead Design (Ripley Design Inc.) ..... Stephanie Sigler

I. Planning Process

Note: The Loveland Mountain Club and Peloton Cycles were invited to participate on the Technical Advisory Committee but did not attend the site visit.

Internal TAC Members

Weeds (Larimer County DNR) ..... Casey Cisneros

Trails (Larimer County DNR)..... Joel Schwab

Engineering (Larimer County Engineering)..... Joe Temple

Education (Larimer County DNR) ..... Heather Young

Community Relations (Larimer County DNR) ..... Rob Novak

Visitor Services (Larimer County DNR)..... Dan Rieves

Rangers/Operations (Larimer County DNR) ..... Travis Rollins

Planning and Development (Larimer County DNR) ..... Meegan Flenniken

Project Management (Larimer County DNR) ..... Jeffrey Boring

Public Meetings

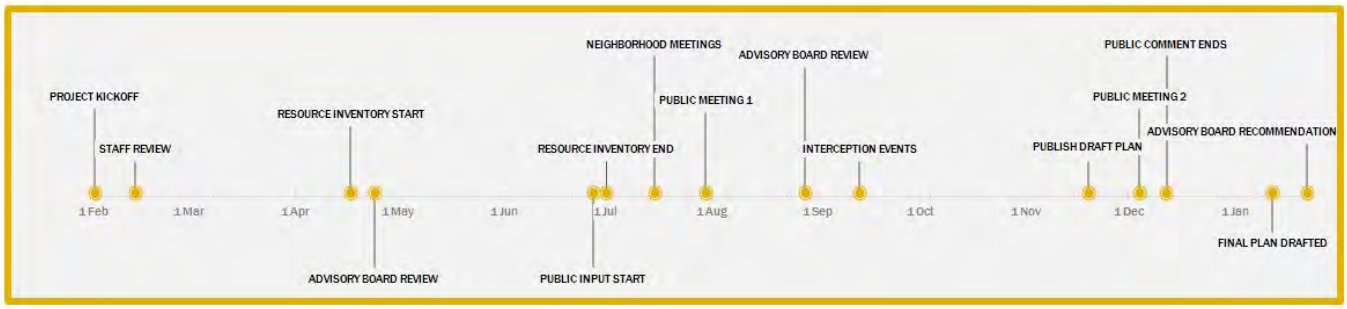

Figure 1. Devil's Backbone Management Plan Update Schedule

Two public meetings were conducted (Figure 1) to collect public input. The purposes of the first public meeting were to educate the public about the issue of trail congestion, to address parking along Hidden Valley Drive, to provide alternative solutions to these problems and to request feedback on preferred solutions. Seventeen people attended the first public meeting.

The second public meeting was designed to get feedback on the draft management plan. Ten people attended the second public meeting.

Photo by Rob Novak

Social media and press releases were used to advertise the public meetings. All homeowners within ¼ mile of the Devil's Backbone Open Space boundary received an invitation postcard via US mail.

Intercept Events

Two intercept events were held, one at the Devil's Backbone Trailhead and one at the Blue Sky Trailhead. These intercept events allowed staff to share potential alternative solutions to capacity issues and collect direct input from trail users. One hundred and fifty contacts were made during the intercept events and 68 individuals completed the survey provided at both intercept events.

Photo by Rob Novak

Project Website

A project website was developed that included a video introduction to the planning process, visual aides and the draft plan. A short survey about the proposed key management actions was provided. Thirty-five individuals completed the website survey, bringing the total number of survey participants to one hundred and three (n=103). Social media was used to direct followers to the website when new information was published.

Advisory Boards

Finally, the City of Loveland Open Lands Advisory Commission and Larimer County Open Lands Advisory Board (OLAB) were briefed on the project and OLAB reviewed and recommended approval of the plan.

II. Existing Conditions

2.1 Natural Resources

Weather

Devil's Backbone Open Space is located along the eastern slope of the Rocky Mountains and has highly variable weather. The climate can be characterized as semi-arid with a strong seasonal variation in temperature, abundant sunshine and relatively low precipitation.

High temperatures average between 81-85 degrees Fahrenheit between June and August and low temperatures average between 21-23 degrees Fahrenheit between November and March. Winters are generally cold but are characterized by substantial temperature swings. High temperatures in the 50s are not uncommon in the winter months.

Average annual precipitation is 15-16 inches, with the greatest amount occurring in April and May. Average annual snowfall is approximately 41 inches, but as a result of wind redistribution and topographic patterns, the snow depth can vary throughout the site.

Topography/Geology/Soils

Devil's Backbone Open Space has highly variable topography, ranging from gently sloping rangeland (0-8% slopes) to steep cliffs (90% slopes) and rocky hogbacks. Elevations on the open space range from 5,087 feet at the base level of Hidden Valley to 6,223 feet at the highest point on the Indian Creek Property (Figure6). The open space is located at the extreme western edge of the Colorado Piedmont section of the Great Plains physiographic province, at its border with the Rocky Mountain Uplift.

The site includes the southern two-thirds of the Devil's Backbone rock outcrop, which rises sharply about 220 feet above the surrounding valleys. The outcrop is composed of gray-brown to tan sandstones of the Lytle Formation. This sandstone is more resistant to erosion than the Jurassic Morrison Formation on the east or the Benton Shale on the west (CTL/ Thompson, 1998).

From the southern base of Milner Mountain, the Big Thompson Anticline plunges to the southeast, with its western limit at the Devil's Backbone rock outcrop. The anticline crosses through Hidden Valley and the sandstone ridge of the Triassic Lykins Formation that forms its base. The Lykins Formation is generally composed of red siltstones, fine-grained sandstones, pink limestone and gypsum near the base. The historic gypsum quarries on the open space are in the basal unit of the Lykins Formation.

The highest portions of the property which also make up the southern outsloping of Milner Mountain include metasedimentary rock knotted with mica schist. The northwest boundary of the property contains the Milner Mountain Fault traversing northwest to southeast at the base of the very steepest slopes. Indian Creek drainage is flanked by the Fountain Formation which transitions to the east from Ingleside to Satanka Formations comprising the rimrock cliffs. From the top of the easternmost hogback and sloping to the east and south the Lyons formation underlies these slopes.

II. Existing Conditions

Devil's Backbone Open Space contains a variety of soil types as shown on Figure 2. Soil development is relatively thin on slopes within the site and comparatively greater in the valleys. The major soil associations listed in the *Soil Survey of Larimer County Area, Colorado* by the USDA-SCS, include the following (USDA-SCS 1980):

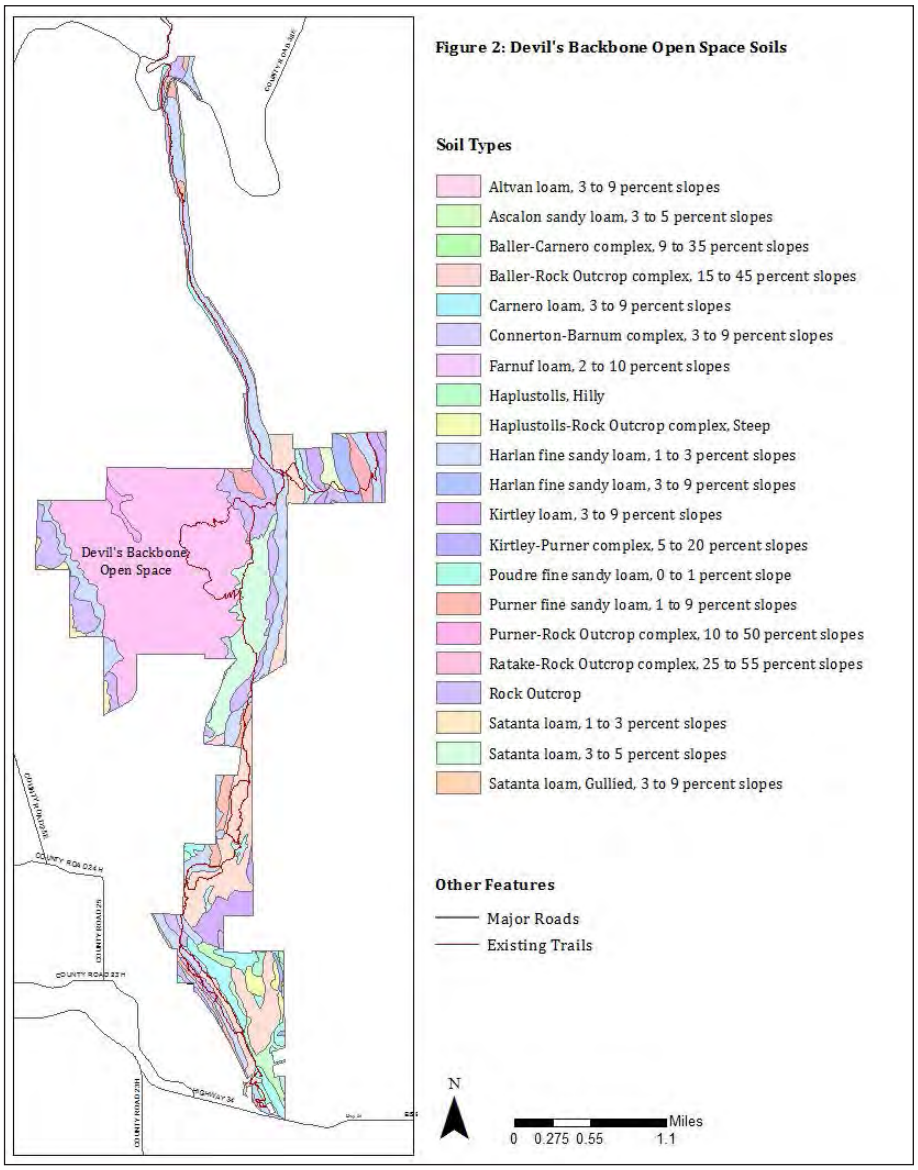

Figure 2 Devil's Backbone Open Space Soils.

<u>Haplustolls-Baller-Rock Outcrop Association</u>

Shallow to deep, strongly sloping to steep, well-drained mainly loams, clay loams and stony sandy loams that formed in material weathered from sandstone, and rock outcrop; on uplands.

<u>Kirtley-Purner-Haplustolls Association</u>

Shallow to deep, nearly level to steep, well drained mainly loams, fine sandy loams and clay loams that formed in materials weathered from sandstone on uplands and fans.

<u>Haploborolls-Boyle-Ratake Association</u>

Shallow to deep, nearly level to very steep, well-drained to excessively drained mainly loams, sandy loams, gravelly sandy loams or channery loams formed in materials weathered from granite and schist; on mountainsides.

These soil complexes have a dramatic impact on how the land can be used. Many of the soils in the area are characterized as having medium runoff and moderate to severe erosion potential with the possibility of gully formation.

II. Existing Conditions

Hydrology

There are many small drainages, including Rattlesnake Gulch, that run east to west from Milner Mountain and flow into Indian Creek and ultimately into Buckhorn Creek and the Big Thompson River (Figure 3). There are at least five springs on the open space: two flow west from the west side of the Indian Creek property; a third flows in the northernmost drainage on the Indian Creek property; a fourth spring flows westward under the Wild Loop Trail on the Hunter Property; and a fifth spring is located just west of Indian Creek itself and was developed with a concrete trough and apron and flows primarily underground into the creek. The southwest flowing spring on the Indian Creek Property (Figure 3) has been dammed by the previous owner.

A small shallow pond has developed in one of the gypsum pits on the Hidden Valley II property. This ephemeral pond is fed by groundwater. At least three species of amphibians inhabit this pond.

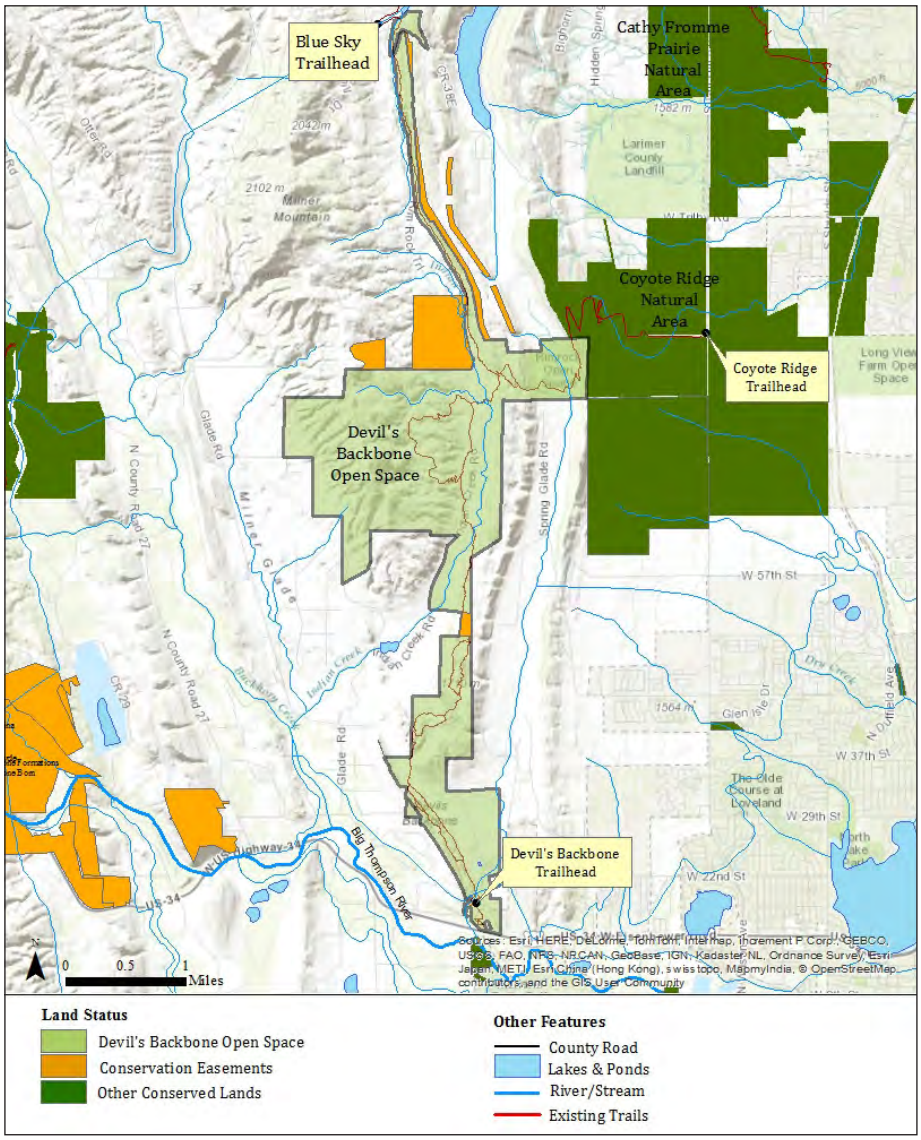

Figure 3 shows the location of the hydrological features on Devil's Backbone Open Space.

The existing Louden Ditch traverses the southern end of the Devil's Backbone Open Space just north of the trailhead before entering an underground siphon that crosses the Hidden Valley property west to east. Seepage from the ditch creates temporary and seasonal runoff along a portion of abandoned ditch way and flows into a small pond surrounded by cottonwood trees.

Common Plant Communities

Vegetation types present within the Devil's Backbone Open Space include foothills grasslands, mountain mahogany shrublands, open ponderosa pine woodlands, and riparian bottomlands. Vegetation types are shown on Figures 4a and 4b.

Mountain Mahogany Shrublands

Mountain mahogany (*Cercocarpus montanus*) shrublands occur in portions of the Devil's Backbone Open Space with moderately steep slopes and shallow soils. While this shrubland community is dominated by mountain mahogany, it also contains other shrub species such as three-leaf sumac (*Rhus trilobata*), wax currant (*Ribes cereum*) and rabbitbrush (*Chrysothamnus nauseosus*). The herbaceous shrub understory consists of various grass and forb species including fringed sage (*Artemisia frigida*), blue grama (*Bouteloua gracilis*), yucca (*Yucca glauca*), prickly-pear cactus (*Opuntia polyacantha*), nailwort (*Paronychia jamesii*), and side-oats grama (*Bouteloua curtipendula*).

The condition of the Mountain Mahogany shrubland was assessed in 2009 by staff, based on the Colorado Natural Heritage Program's (CNHP) Rocky Mountain Lower Montane-Foothill Shrubland Ecological System Ecological Integrity Assessment protocol. The results indicated that the mountain mahogany shrubland system, overall, was in good condition. The biotic community was in excellent condition. In particular, over 95% of the species observed were native, there were no system-altering weed species observed, and all available patch types were present and well interspersed. Abiotic conditions were also excellent. There were no signs of erosion and very little disturbance or fragmentation had occurred. The shrub system scored fair in the landscape context and size categories due to surrounding residential land uses and small size.

Foothills Grasslands

The foothills grassland complex contains many grass and forb species including blue grama (*Bouteloua gracilis)*, big bluestem (*Andropogon gerardii*), little bluestem (*Schizachyrium scoparium*), needle-and-thread (*Stipa comata*), green needle (*Stipa viridula*), purple three-awn (*Aristida purpurea*), fringed sage (*Artemisia frigida*), Indian ricegrass (*Oryzopsis hymenoides),* wild buckwheat (*Eriogonum effusum*), scurfpea (*Psoralidium tenuiflora*), sand lily (*Leucocrinum montanum*), evening primrose (*Oenothera* spp.), and globemallow (*Sphaeralcea coccinea*).

The condition of the foothills grassland community at Devil's Backbone Open Space is fair. County staff implemented CNHP's Western Great Plains Foothill Piedmont Grassland Ecological Integrity Assessment protocol in 2010 and found the biotic community to be suffering from weeds such as cheatgrass (*Bromus tectorum*) and sweet clover (*Melilotus spp*). In 2014, data has shown that feral rye (*Secale cereale*) has become a dominant weed as well. In many of the grass patches, the shrub community was absent and the matrix was dominated by grasses

Photo by Jim Disney

and common sagewort (*Artemisia campestris*).

Open Ponderosa Pine Woodlands

The ponderosa pine (*Pinus ponderosa*) woodlands that encompass a small portion of the open space are in good condition. These areas are open and park-like with an understory of grasses and forbs including blue grama (*Bouteloua gracilis)*, big bluestem (*Andropogon gerardii*, little bluestem (*Schizachyrium scoparium*), side-oats grama (*Bouteloua curtipendula*), fringed sage (*Artemisia frigida*), scurfpea (*Psoralidium tenuiflora*), and purple three-awn (*Aristida purpurea*), among others.

The ponderosa pine woodlands comprise a small area at Devil's Backbone Open Space and the health of this plant community has not been studied.

Riparian Communities

Steep riparian communities occur on both the east and west faces of Milner Mountain. The communities are dominated by shrubs including chokecherry (*Prunus virginiana*), three leaf sumac (*Rhus trilobata*), boulder raspberry (*Oreobatus deliciosus*), and wax currant (*Ribes cereum*). Narrow leaf cottonwoods (*Populus angustifolia*) occasionally occupy the canopy. Indian Creek, located in the eastern valley, is an intermittent stream that has been severely altered and lacks the composition of a plant community representative of a second order stream.

The condition of the first order streams and riparian communities have not been

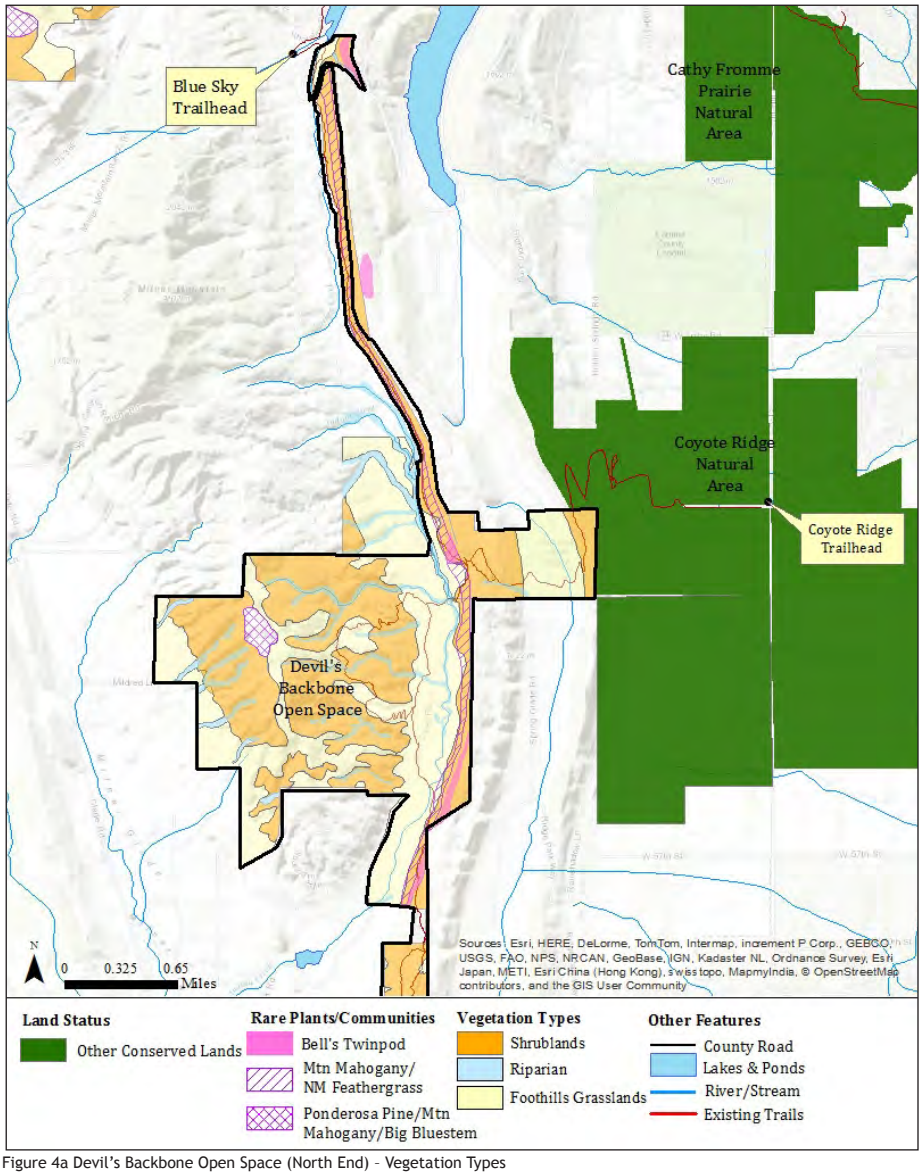

Figure 4a Devil's Backbone Open Space (North End) - Vegetation Types

studied. The condition of Indian Creek is poor. Very little woody structure exists, banks are steep and failing and weeds are common.

Exotic Plants and Noxious Weeds

Exotic plants have become established as a result of historic land use, such as grazing, and also infiltrate from surrounding areas. Exotics present at Devil's Backbone Open Space include three bromes: cheatgrass (*Bromus tectorum*), Japenese brome (*Bromus japonicus)* and smooth brome *(Bromus inermis).* Also present are Canada thistle (*Cirsium arvense*), Russian thistle (*Salsola australis*), musk thistle (*Carduus nutans*), Russian olive (*Elaeagnus angustifolia*) and feral rye (*Secale cereale*).

In particular, the Indian Creek valley floor and the valley floor west of Milner Mountain (Milner Glade) have been severely degraded by the invasion of cheatgrass and feral rye. In the most heavily infested areas, cheatgrass cover exceeded 90% and rye 70%. In 2014, cheatgrass covered as much as 30% and rye as much as 6% of the Indian Creek Valley. The Milner Glade contained approximately 48% rye and 5% cheatgrass. Other non-native species documented on the property are listed in the attached vegetation species list (Appendix B).

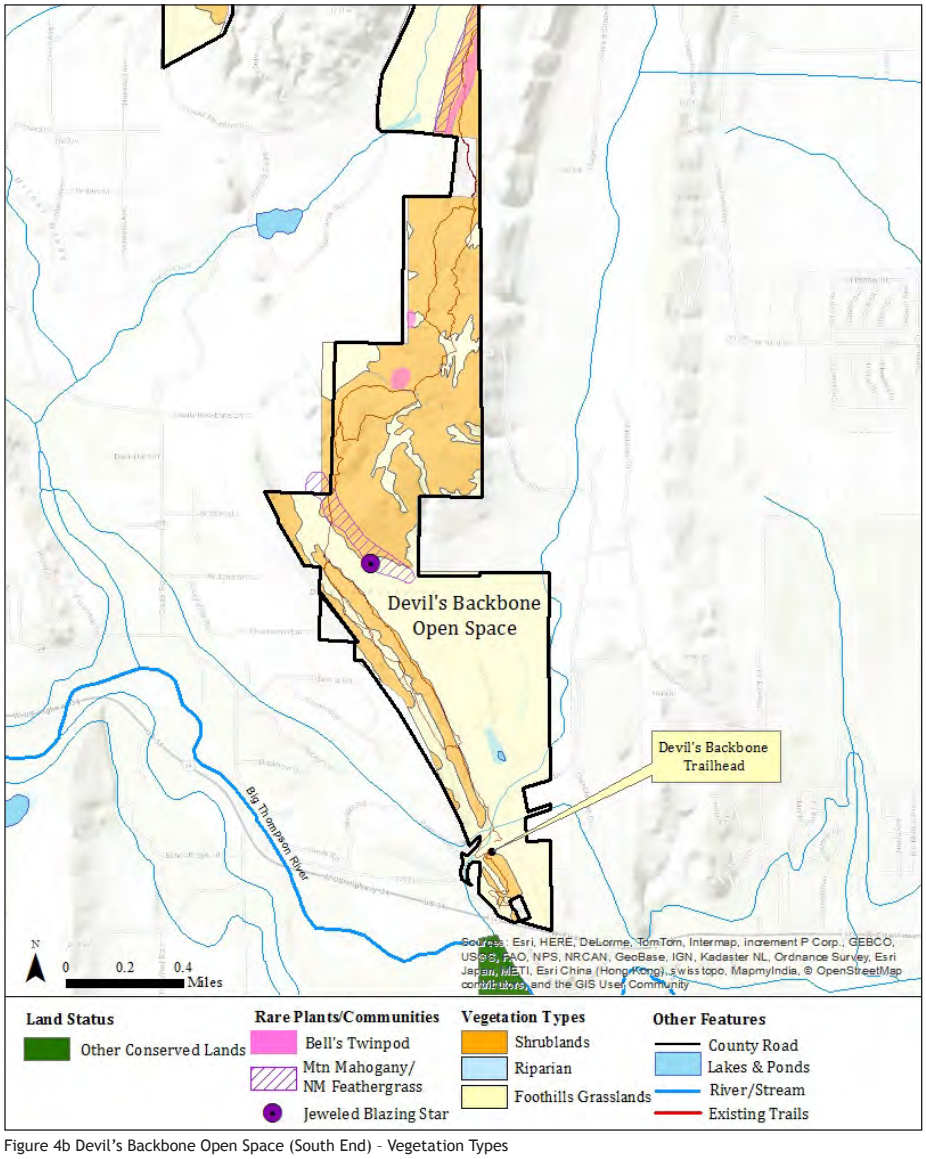

Figure 4b Devil's Backbone Open Space (South End) - Vegetation Types

Endangered and Threatened Plants

A CNHP inventory conducted in July 2003 verified that the Devil's Backbone Open Space is an extension of the Horsetooth Reservoir Hogbacks Potential Conservation Area (PCA) (Kettler, 1996). The Horsetooth Reservoir Hogbacks PCA is of very high biodiversity significance (B2 ranking) and contains imperiled foothills plant communities, vegetation

and butterflies. Devil's Backbone Open Space supports the globally imperiled foothills plant community and its vegetation.

The foothills shrubland communities found along the hogbacks from Horsetooth Reservoir to the Devil's Backbone form a continuous band stretching north to south approximately ten miles. The network of protected open space areas along the hogbacks protect not only foothills plant communities but also the wildlife dependent upon them.

Rare Plants

Bell's twinpod (*Physaria bellii*) can be found on those portions of the open space that are dominated by sandstones of the Ingleside Formation; although it is generally more commonly associated with limestones and intermixed shales of the Niobrara Formation (Figures 4a and 4b). Specifically, at the Devil's Backbone Open Space, Bell's twinpod can be found along the ridge above Indian Creek and in small pockets interspersed along the southern extension of this ridgeline. According to CNHP, this species is globally imperiled, ranking G2 S2 (CNHP "About the Heritage Network Ranking System", 2014). It is a Colorado endemic that occurs only along the Front Range, primarily in Larimer and Boulder counties.

Photo by Jeffery Boring

In 2012, CNHP found the Bell's twinpod occurrence to be in excellent condition and gave it a B rank with the potential for 450 acres of habitat and 4,000-6,000 plants (Smith, 2012). Over 1,700 plants and 130 acres of habitat were observed.

A new occurrence of a globally and state vulnerable species was observed in 2012. Jeweled blazingstar (*Nuttallia speciosa*) was found in a mountain mahogany shrubland, along a densely vegetated steep, south facing slope. The fair C-rank occurrence was observed early in April of 2012 and the population is likely larger than observed.

Rare Plant Communities

The varied topography at the Devil's Backbone Open Space supports a range of foothills plant communities, many of which are imperiled due to land conversion and development pressures along the Front Range. Imperiled plant communities within the open space include mountain mahogany/needle-and-thread (*Cercocarpus montanus/Stipa comata*) (G2 S2), ponderosa pine/mountain mahogany/big bluestem (*Pinus ponderosa/Cercocarpus montanus/Andropogon gerardii*) (G2/S2) and mountain mahogany/New Mexico feathergrass (*Cercocarpus montanus/Stipa neomexicana*) (G2G3/S2S3).

The first two communities occur as a small patch within a mosaic of grasslands, mountain mahogany shrublands and ponderosa pine woodlands. These communities occur at the highest point of the open space both in and just south of the open ponderosa pine

woodlands. The mountain mahogany/needle-and-thread community is an open shrubland association dominated by mountain mahogany, with three-leaf sumac and needle-and-thread grass nearly always present in lower abundance. This association is found from 5,700-6,800 feet elevation, on moderate to steep slopes and on topographic features including hogbacks, ridges, mesas and slopes (NatureServe, 2003). The mountain mahogany/New Mexico feathergrass community is abundant along the eastern slopes of the property below the rimrock cliffs.

The Element Occurrence (EO) Record for the mountain mahogany/New Mexico feathergrass community was updated by CNHP in 2012 (Smith, 2012). The condition of this occurrence did not change since 1996, when it received a C ranking. The occurrence is small, some exotics are present, a powerline and road fragment the occurrence and the adjacent grasslands are invaded by exotics.

Natural Heritage element occurrences at the Devil's Backbone Open Space

Element	Common Name	**Global Rank**	**State Rank**
Plant Communities			
Cercocarpus montanus/Stipa neomexicana	Mountain Mahogany/New Mexico Feathergrass	G2G3	S2S3
Pinus ponderosa/Cercocarpus montanus/Andropogon gerardii	Ponderosa Pine/Mountain Mahogany/Big Bluestem	G2	S2
Cercocarpus montanus/Stipa comata	Mountain Mahogany/Needle-and-Threadgrass	G2	S2
Plants			
Physaria bellii	Bell's twinpod	G2	S2
Nuttallia speciosa	Jeweled blazingstar	G3	S3

Wildlife

The Devil's Backbone Open Space supports a variety and abundance of wildlife. Wildlife species that utilize the area include elk, mule deer, fox, mountain lion, bear, coyotes, prairie dogs, reptiles, amphibians, rabbits, rodents and other species. This site is part of a large mule deer winter concentration area, as identified by the Colorado Parks and Wildlife. A moderate-sized population of mule deer primarily frequents the Indian Creek Property. See Appendix B for a list of animals observed at the Devil's Backbone Open Space.

Photo by Sue Burke

II. Existing Conditions

Preble's Meadow Jumping Mouse

A CNHP survey conducted in 2014 for the Hidden Valley II property found no habitat that would justify conducting a trapping survey for the federally threatened Preble's meadow jumping mouse (Smith, Lambert and Sovell, 2014). The necessary soil moisture, density of grasses and forbs, density of shrubs and diversity of vegetation was not present. A concurrence letter from Susan Linner, Colorado Field Supervisor, US Fish and Wildlife Service was received on July 15, 2014.

Preble's are not likely to inhabit any other areas of Devil's Backbone Open Space. A US Fish and Wildlife Service (USFWS) habitat evaluation and trapping event was conducted at the north end of the Indian Creek Property in June 2004. No Preble's were trapped and the USFWS gave clearance for construction of a trail across the Indian Creek drainage.

Another trapping survey was conducted along Indian Creek, south of the Devil's Backbone boundary. This survey was also unsuccessful (T. M. Phelan, 1999, 0 captures in 1140 trapnights). There are additional unsuccessful trapping attempts along the Big Thompson River (1 – 2 km away) conducted by M. Bakeman (0 captures in 420 trapnights, 1997) and T. Shenk (0 captures in 748 trapnights, 1998).

The closest Preble's capture to Devil's Backbone Open Space was along the Dry Creek tributary to Big Thompson River, which is 8 km (5 mi) southwest of the open space (trapped by Tom Ryon for Bureau of Reclamation in 2008, PMJM database Colorado Parks and Wildlife 2011).

Butterflies

Devil's Backbone Open Space provides limited habitat for rare butterflies, due to poor condition of the grassland community, size of habitat and neighboring residential land uses. However, a butterfly survey conducted at Devil's Backbone in 2010 by CNHP located two rare butterflies (Sovell, 2011).

Dusted skippers (*Atrytonopsis hianna*) (G4/G5 S2) were observed at three locations and ottoe skippers (*Hesperia ottoe)* (G4/G5 S2) were observed in one location. A butterfly survey was also conducted in 2014 on the Hidden Valley II site, but no rare butterflies were observed. Figure 5 shows the locations of potential rare butterfly habitat.

Birds

Raptors nest, roost and hunt at Devil's Backbone Open Space. Raptor species that have been observed nesting on-site include red-tailed hawk, great-horned owl, barn owl, golden eagle and prairie falcon. Northern harriers have been observed hunting.

Photo by Kev McCartney

Figure 5 highlights the location of known raptor and bird nest sites. The Devil's Backbone rock outcrop is utilized by cliff swallows, ravens and pigeons. A full list of the bird species observed at Devil's Backbone Open Space is located in Appendix B.

Prairie Dogs

There are black-tailed prairie dog (*Cynomys ludovicianus*) colonies located both on the Hidden Valley and Indian Creek properties (Figure 5). Prairie dog colonies are dynamic and their habitat area can change within a year. Prairie dogs are susceptible to plague and entire colonies can "plague out" and become extirpated. While prairie dog colonies can be visually unappealing and are often dominated by weeds and bare ground, they have ecological importance. Prairie dogs are often referred to as a keystone species because they create habitat that many prairie species depend upon including horned lark, killdeer, burrowing owl, reptiles and insects. Prairie dogs graze heavily, changing the plant community and enhancing soil fertility through their extensive burrow system. Prairie dogs also provide an important source of prey for predators including fox, coyotes and raptors.

Reptiles and Amphibians

Prairie rattlesnakes (*Crotalus viridis*), North American racers (*Coluber constrictor*) and six-lined racerunner lizards (*Aspidoscelis sexlineatus*) were observed in 2014 during a biological survey conducted by CNHP on the Hidden Valley property. Thirty-two potential sites were documented for prairie rattlesnake dens but only one rattlesnake was observed. This concludes that the Hidden Valley parcels do not exhibit the signs of an area in which rattlesnakes congregate and that avoidance of the area is not necessary.

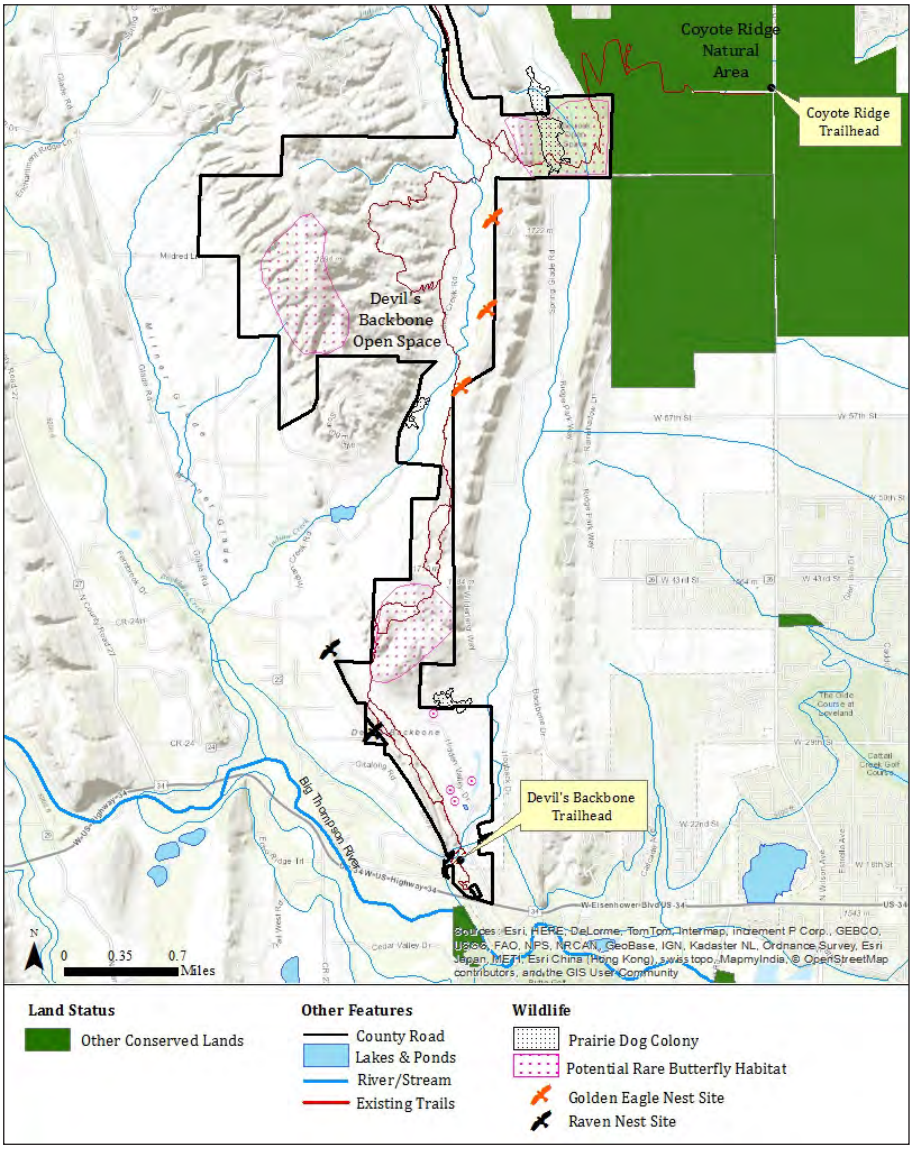

Figure 5 Devil's Backbone Open Space Wildlife

II. Existing Conditions

The small wetland pond on the Hidden Valley property supports at least three species of reproducing amphibians. Woodhouse's toad *(Anaxyrus woodhousii*), western tiger salamander (*Ambystoma mavortium*) and boreal chorus frog (*Pseudacris maculate*) were all observed at the pond. Chorus frogs were heard vigorously calling and Woodhouse's toads were observed in amplexus, indicating that both of these species use the pond for breeding.

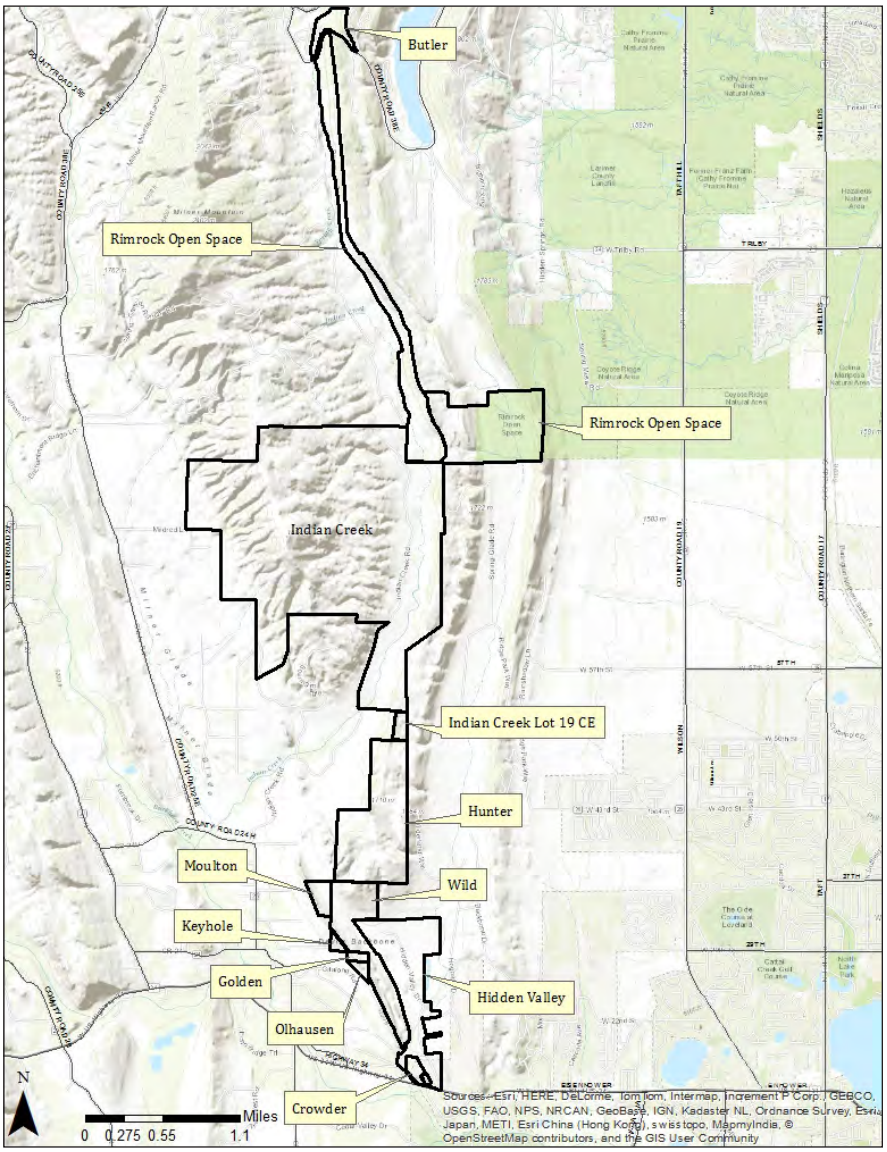

Figure 6 Devil's Backbone Open Space Property Parcels.

Environmental Site Assessment

Environmental assessments were conducted for many of the properties that comprise Devil's Backbone Open Space. If no apparent environmental problems were observed at the time of purchase to warrant an environmental assessment, an assessment was not ordered. See Figure 6 for the location of Devil's Backbone properties.

Butler Property

A Phase I Environmental Assessment was completed by CTL/Thompson in 2002 for the Butler property. Other than past use of above ground storage tanks, the report did not find evidence of recognized environmental conditions in connection with the site (CTL/ Thompson, Inc, 2002).

Golden Property

A Phase I Environmental Assessment was completed by CTL/Thompson in 1998 for the Golden property. The consultant found no evidence of recognized environmental conditions at the site or adjacent properties, during reconnaissance, review of the site history or public records review (CTL/Thompson, Inc, 1998b).

Hidden Valley I and II Property

Several Phase I Environmental Assessments were conducted for this property and included findings of:

- The mine quarry, possible tunnels and areas of geologic instability (subsidence) remain on site and USG Corporation is presently under no regulatory obligations to perform remediation of former mining activities (the two areas of subsidence were filled with native soil in 2002).
- No impact to groundwater was observed and the Colorado Department of Public Health and the Environment found that no additional monitoring or action was needed.

Indian Creek Property

The Phase I Environmental Assessment for the 1,545-acre parcel was also conducted by CTL/Thompson in 2003 (CTL/Thompson, Inc, 2003). No evidence of underground storage tanks or above ground storage tanks, unusual staining or odor, hazardous material use or storage, or physical irregularities was associated with the site.

Wild Property

A Phase I Environmental Assessment was conducted in 1998 by CTL/Thompson (CTL/Thompson, Inc, 1998a). No evidence of underground storage tanks or unusual staining or odors was observed on or adjacent to the site. The only observed physical irregularities include the piles of bricks dumped in the small ravine just east of the rock formation and excavations for apparent mining purposes.

2.2 Cultural Resources

Brief Site History

The Devil's Backbone Open Space and surrounding properties have a colorful history and, with a discerning eye, the signs of mining, irrigation and manufacturing are obvious.

Before European settlers entered the area around the Devil's Backbone it was frequented by the Arapahoe and Cheyenne with occasional incursions by the Utes. At the end of the Civil War, settlements and military outposts became established in the area and the native tribes were forced north and west.

In 1878, Aaron Benson, a native of Louden, Iowa, moved to the Big Thompson Valley from Golden, Colorado. Around 1888, Benson built an irrigation ditch (the main Louden Ditch) that cut through the southern end of the Devil's Backbone, and originally serviced 12,000 acres of farmland (Miner 1976). The ditch once crossed through the south end of the Devil's Backbone rock outcrop and is still in use today as an open, concrete-lined channel.

Three years after Benson started his project, Alfred Wild bought a portion of the Devil's

II. Existing Conditions

Backbone property. Wild grew many types of fruit and berries on his farm including pears, plums, apricots, peaches, nectarines, strawberries and raspberries. At one point he had over two thousand fruit trees. Wild also experimented with growing hops and was dubbed "Colorado's Pioneer Hop Grower." He consistently sold his crop to the P.H. Zang Brewing Co. in Denver (Jessen, 1984).

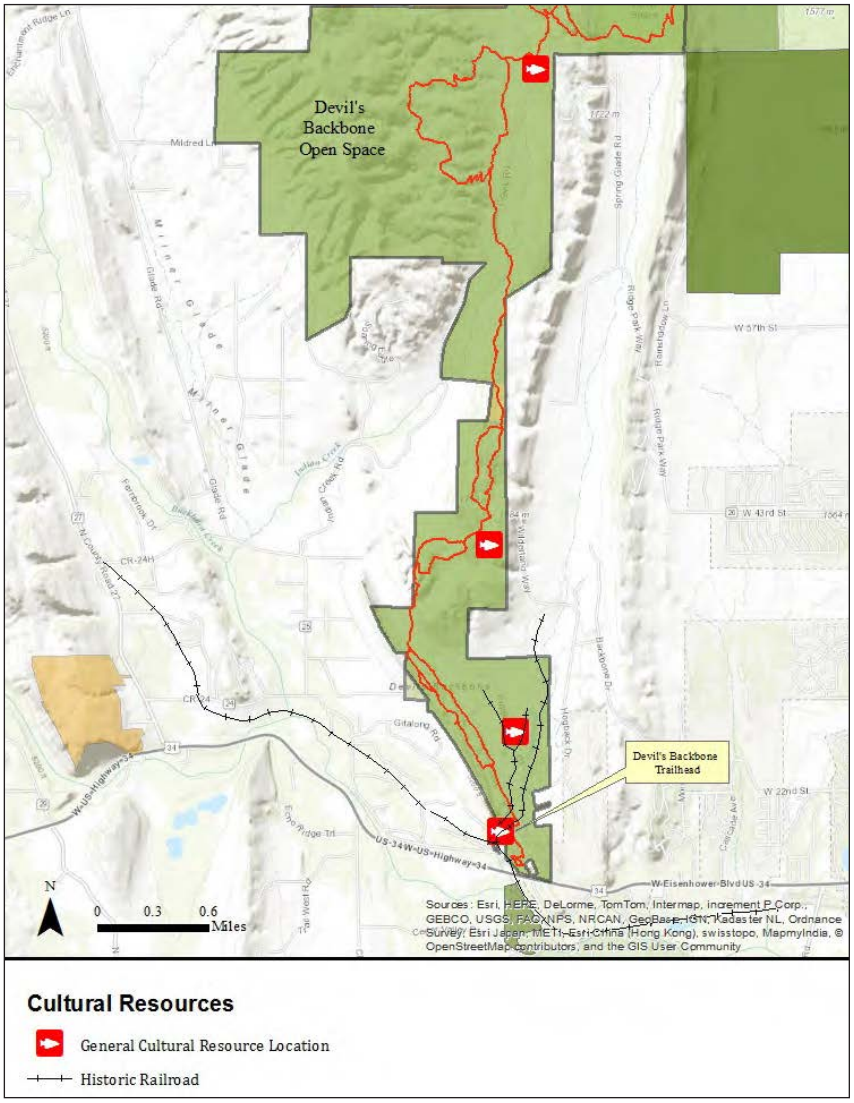

Figure 7 Devil's Backbone Open Space Cultural Resources

During construction of the Louden Ditch around the south end of the Devil's Backbone, workers struck gypsum. Gypsum is a mineral most often used in the manufacture of plaster of Paris, various other plaster products, and fertilizers. Wild first built a crude outdoor mill and eventually an enclosed mill was constructed at the south end of the Devil's Backbone rock outcrop (the foundation of which is still visible today just northwest of the main trailhead) (Jessen, 1984). Gypsum was mined in Hidden Valley from 1915-1965 by U.S. Gypsum Corporation and hauled on a three-foot gauge rail line to the plaster mill. During the mining process, miners found several mammal fossils, including a prehistoric elephant with 5-foot long tusks, a jawbone with seven teeth intact, and some equine and bison bones. The mill operated just north of Highway 34 from 1887 until 1965 when a flood on Buckhorn Creek destroyed it (Jessen, 1999). In 1976, following a Big Thompson Flood, the U.S. Army Corps of Engineers buried flood debris in portions of the quarry pits.

Above the gypsum deposit, Wild found good fire clay suitable for making brick and opened the Peep O' Day Kiln Company. In 1924, kilns were built on the west side of the Backbone. The Company began mining and hauling fire clay from the east side of Devil's Backbone (in Hidden Valley) and down to the kilns by a two-foot gauge railway. The kilns produced brick until the end of World War II (Jessen, 1984).

Alfred Wild also founded the town of Wild on his property and a rail spur (Arkins Line) was built from Loveland that permitted daily train service through the new town. Streets were

laid out and the new town even appeared on some maps. However, few individuals chose to live in the town of Wild (Jessen, 1984).

The northern 247 acres (Hunter Property) were owned by Carl Fink from 1937-1947. He planted 30 acres of cherry trees that yielded approximately 15 tons of cherries each year, had a fox farm and grazed horses in winter. From 1960-1976, Warren Wolaver owned the property and eventually sold it to James Roy and Eileen Hunter. The Hunter's grazed cattle and raised horses on the property.

Remnants of gypsum mining and brick manufacturing can be seen today. In Hidden Valley, the abandoned gypsum quarry site, portions of the railroad grade with a few railroad spikes and ties, some historic farming equipment, and the powder magazine used for dynamite storage can still be observed. There is evidence on the northeast side of the rock outcrop of an old tunnel that was excavated under the property to convey water from west to east. However, the tunnel has either caved in or been filled on the west side. Bricks, fired from clay mined on the site, still remain as mostly rubble and are piled in a gully just east of the rock outcrop. The Louden Ditch is still in service today. Finally, an old foundation and a concrete well both still remain at the north end and central portions respectively along Indian Creek.

In 1999, an archaeological inventory of the original 420 acres of the Devil's Backbone Open Space included a stone hunting blind placed on a hogback overlook. The blind is small and was not dated. In summer of 2004, a Colorado State University archaeologist informally visited the site and did not note any anomalies.

The rich cultural history of the Devil's Backbone area makes it an important landmark of Larimer County. Figure 7 shows the location of the cultural resources located on the property.

2.3 Visual Resources

The foothills west of the cities of Loveland and Ft. Collins and the Devil's Backbone rock outcrop are prominent landforms and visual landmarks of this area. This area contains the first rise of foothills and scenic hogbacks that contribute much to the setting and character of southeast Larimer County. The area contains a relatively undeveloped, scenic valley that runs from the community of Stout at the south end of Horsetooth Reservoir to Devil's Backbone.

Photo by Scott Bacon

II. Existing Conditions

The Devil's Backbone rock outcrop is a defining feature of Larimer County. This vertical wall of Dakota Sandstone is a prominent rock outcrop easily viewed from Highway 34, marking the foothills region between the plains and high mountains. The formation contains several small natural openings and one large opening, over 20 feet tall, known as the "Keyhole."

The property's location along Highway 34, "The Gateway to the Rockies," makes it highly visible to approximately 11,000 travelers daily (CDOT OTIS Traffic Data, Station ID 101421, 2013).

2.4 Existing Improvements

Trails

Currently, there are 15 miles of trail at the Devil's Backbone and Rimrock open spaces. Rimrock Open Space is combined with Devil's Backbone Open Space in this updated management plan. These trails are generally multi-use, but some restrictions do apply. Figure 8 shows the location of existing trails.

Trailheads

There are three trailheads that provide public access to Devil's Backbone Open Space. The most visited trailhead is located on the south end of the property and is accessible from Hidden Valley Lane, north of Highway 34. This is referred to as the Devil's Backbone Trailhead and has 64 parking stalls, a vault toilet, outdoor classroom, two kiosks and a water fountain. There is no entrance fee to the Devil's Backbone Open Space trailhead.

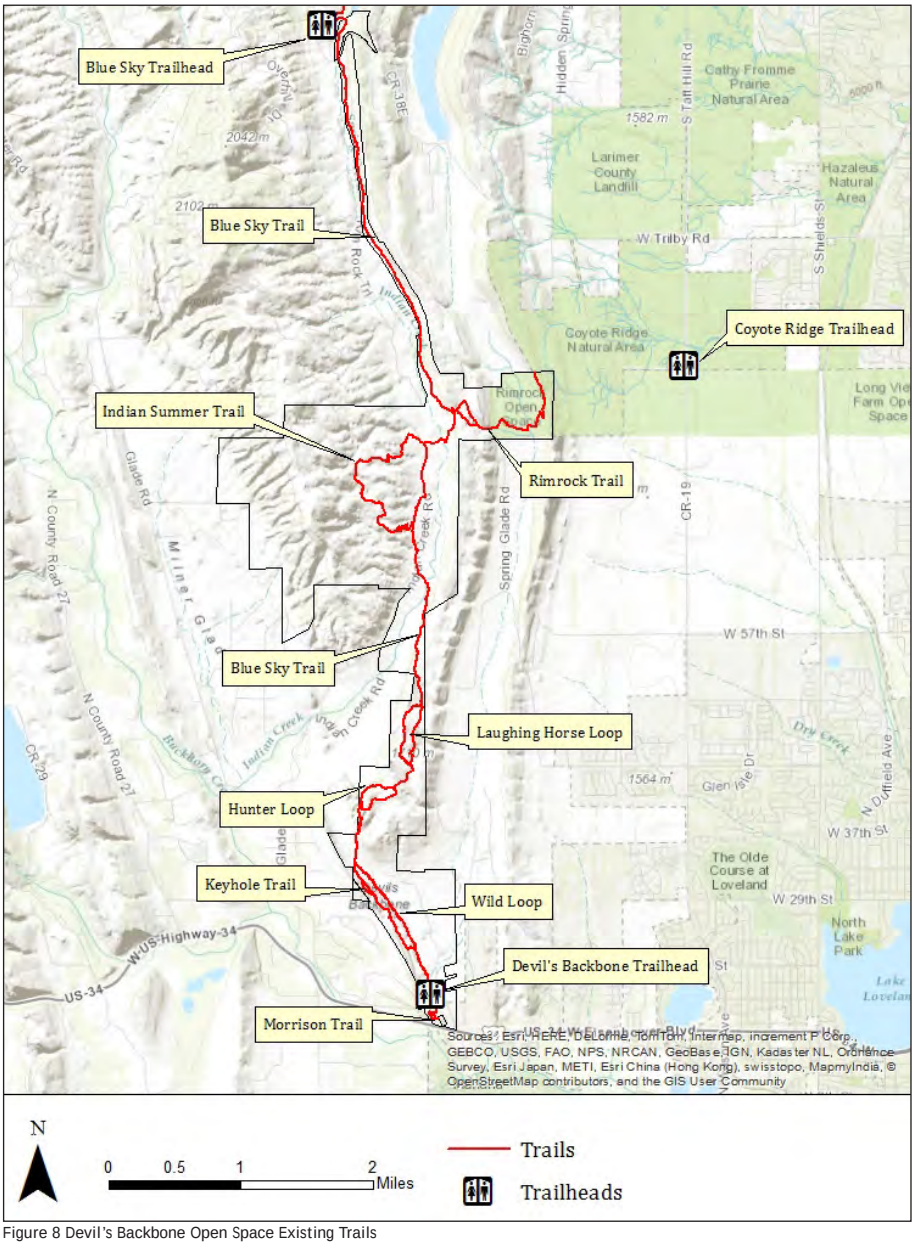

Figure 8 Devil's Backbone Open Space Existing Trails

Visitors can also access Devil's Backbone Open Space from the east, via Coyote Ridge Natural Area, located off Taft Hill Road. Coyote Ridge Natural Area is managed by the City of Fort Collins and includes the following amenities: kiosk, garbage cans, vehicle and equestrian parking. There is no entrance fee to the Coyote Ridge Natural Area trailhead.

Finally, Devil's Backbone can be accessed from the north via the Blue Sky Trailhead located at Horsetooth Reservoir County Park, north of County Road 38E. This trailhead was redesigned in 2012 and provides 51 parking stalls and four equestrian stalls. Horsetooth Reservoir County Park is a fee area and an entrance fee is charged for accessing this trailhead.

Figure 8 highlights the location of the three trailheads that provide public access to Devil's Backbone Open Space.

Neighborhood access is also provided through the following neighborhoods: Backbone Meadows, Indian Creek Estates and Sprenger Valley. These access points were developed in partnership with each neighborhood Homeowner's Association to allow direct access into the open space from the subdivision. There are no public facilities located at these access points and public parking within the neighborhood is prohibited.

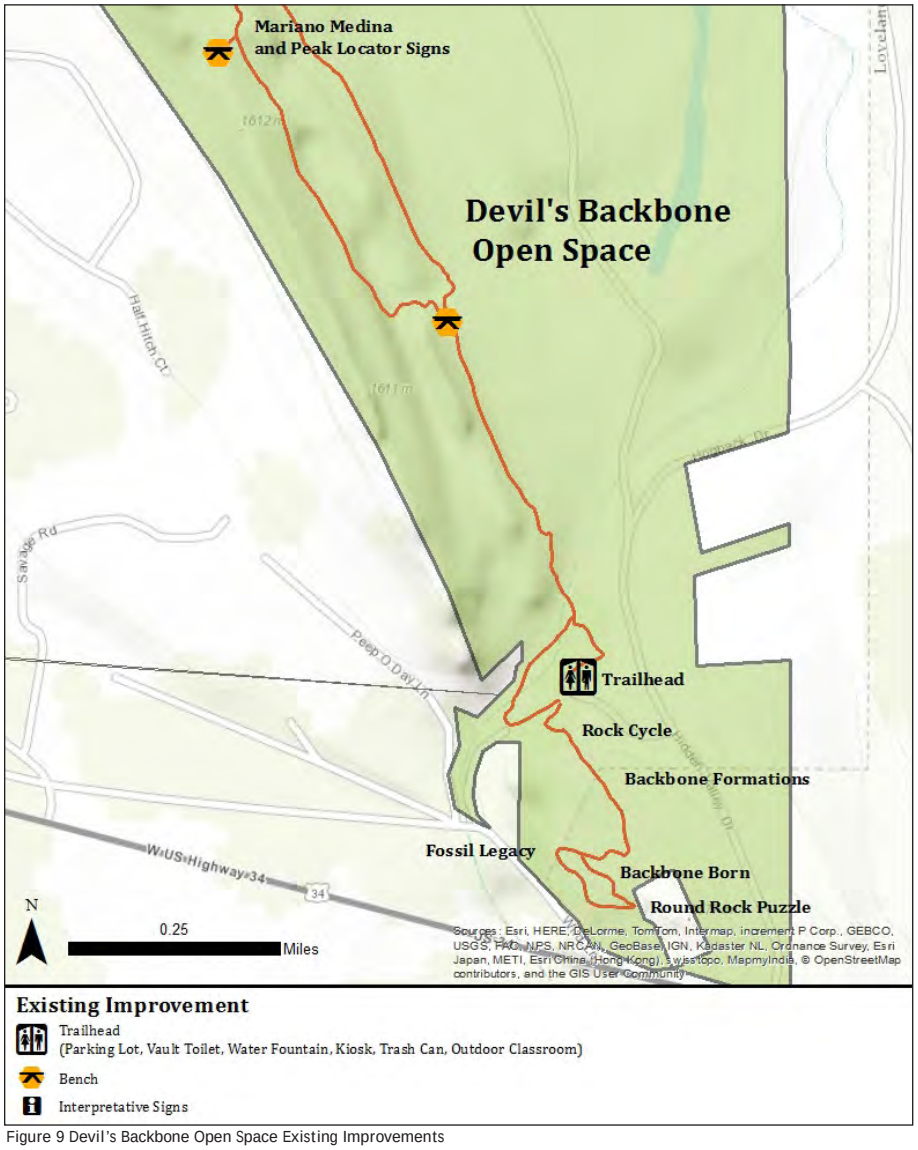

Figure 9 Devil's Backbone Open Space Existing Improvements

Interpretative Signs and Benches

Interpretative signs are located along many of the trails and enhance visitor experience by providing education about natural and cultural resources. The Morrison Trail was designed to highlight the unique geological features of the Devil's Backbone area and four interpretative signs provide a self guided tour of the geological history of the site.

The trailhead kiosk also includes interpretative panels that educate visitors about local wildlife, wildflowers and geology. These panels can be rotated throughout the year to provide seasonal information and offer new opportunities for education.

Additional information on existing interpretative signs is located in Appendix C and Figure 9 shows the location of benches and interpretative signs located at Devil's Backbone Open Space.

Roads

There are several internal unpaved roads within the property. These roads are not designed for public access and are used by Larimer County staff for maintenance, patrol, monitoring and emergency purposes. Many of these roads were in place when Larimer County acquired the property and have been abandoned or restored.

Ditches

Louden Irrigating Canal and Reservoir Company owns and operates Louden Ditch that bisects the southern end of the open space. The company has granted a crossing easement to the Larimer County Natural Resources Department, allowing the Wild Loop Trail to cross the ditch. No other ditches are located on the open space.

Power Lines

Platte River Power Authority (PRPA) has a utility easement across portions of Devil's Backbone Open Space. Additional encumbrances can be found in the property's title policy.

2.5 Water and Mineral Rights

The Devil's Backbone Open Space is composed of multiple parcels (Figure 6) and some of the rights have been severed from each estate.

Butler Property

There are no water rights associated with the Butler property.

Crowder Property

There are no water or mineral rights associated with this property.

Golden Property

The acquisition of the Golden property included no water rights.

Hidden Valley Property

There are no water rights and the mineral rights are intact.

Hunter Property

There are no water rights. 50% of the mineral rights were included in the land purchase.

Indian Creek Property

There are no water rights and all the mineral rights owned by the previous owner were deeded to the county.

Keyhole Property

There are no water rights associated with the Keyhole property. The mineral estate is intact and was acquired by Larimer County.

Moulton Property

The purchase of the Moulton property included all mineral rights owned by the seller. The acquisition included no water rights.

Olhausen Property

There are no water rights associated with the Olhausen property.

Rimrock Property

There are no mineral or water rights associated with the Rimrock property.

Wild Property

No water rights exist. Mineral rights are owned by a separate party and were not included with the purchase of the Devil's Backbone.

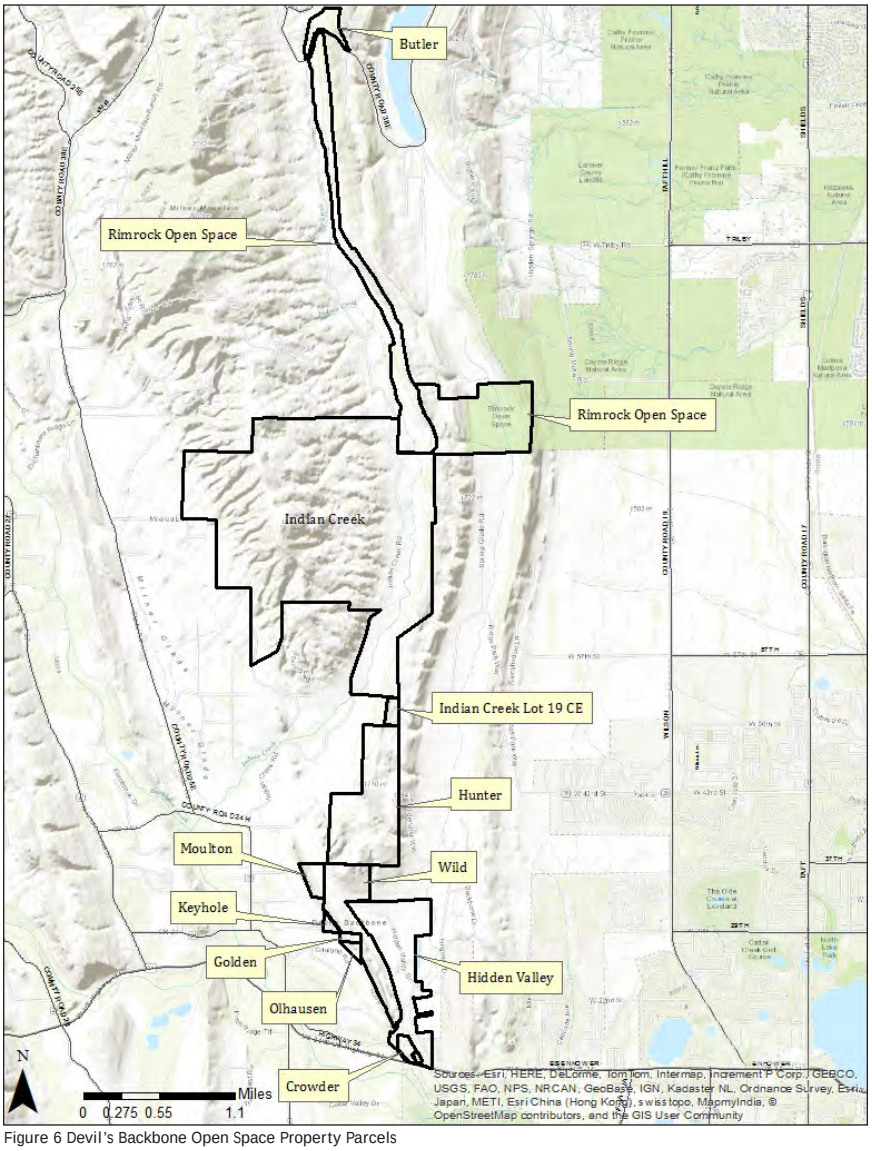

Figure 6 Devil's Backbone Open Space Property Parcels

III. Management Plan

3.1. Recreation Use and Demand


Photo by Kelley Savage

The population of Larimer County increased from 248,987 in 2000 to an estimated 315,988 in 2013, based on data from the US Census. Larimer County projects a total of 420,000 people will live in the County by 2030, an increase of over 100,000 people in just 15 years. These additional residents will increase demand for outdoor recreation, a demand that cannot be met through Devil's Backbone alone. There is a need for more land protection and trail development throughout Larimer County and in close proximity to population centers to meet current and future recreation demand.

The increase in population growth is mirrored in the increase in visitation at Devil's Backbone Open Space. In a 2002 trailhead traffic count, the Devil's Backbone Open Space Trailhead received over 27,000 vehicles in a one year period. From January 1, 2014 to September 3, 2014, on average 197 people per day visited Devil's Backbone Open Space from the trailhead off Hidden Valley Lane. That projects to over 70,000 visitors per year, a substantial increase from 2002.

Visitor Capacity Challenges

Increasing visitation is a sign that the public is satisfied with the Backbone experience and they desire to spend more time at the open space. Based on a survey completed during the management planning process, 84.5% of survey respondents visited Devil's Backbone Open Space more than 3 times a year and 72.8% visited more than 5 times a year.

Repeated visitation is a good indicator of successful open space management, but the additional use can pose significant threats to natural and cultural resources and recreation and education experiences at Devil's Backbone Open Space. The following threats to the open space have been observed or are possible with continued growth in visitation.

Natural Resource Threats

- Threats Observed
    - o Reduction in the frequency of prairie falcon nesting near the Keyhole
    - o Increase in the cover of invasive weeds
    - o Widening of trails, reduction of native plants and development of social trails
    - o Damage to the rock outcropping including graffiti and/or erosion

- Threats Possible
  - Additional trail development and habitat fragmentation
  - Reduction in plant diversity
  - Introduction of a dominant weed into a rare or uncommon plant community
  - Conversion of native plant communities to weedy communities
  - Destruction of imperiled plants like Bell's twinpod
  - Loss of host plants for imperiled butterflies
  - Disturbance to wildlife, abandonment of habitat
  - Habitat loss

Cultural Resource Threats

- Threats Possible
  - Archaeological features such as the hunting blind may be damaged
  - Theft of historic railroad ties, rails and spikes
  - Damage to historic structures such as the mill and dynamite bunker
  - Damage to artifacts during trail construction

Recreation Threats

- Threats Observed
  - Increased user conflicts
  - Reduction of available parking due to increased visitation
  - Widening of trails, reduction of native plants and development of social trails
  - Parking on Hidden Valley Lane causes public safety concerns and neighbor complaints
  - Increase in noise and after hour use
  - Trail closures ignored
  - Increase in pet waste
  - Increase in the number of emergencies

- Threats Possible
    - o Reduction in the quality of the visitor experience
    - o Increase in issuance of parking citations from illegal parking
    - o Increase in frequency of prohibited uses, such as rock climbing or ATV use
    - o Trespassing may occur onto adjacent private property

Education Threats

- Threats Observed
    - o School groups, off-trail use damaging natural resources
    - o Elementary school kids using the open space as a restroom
- Threats Possible
    - o Additional off trail use could result in increased resource damage and public safety concerns
    - o Interpretive signs could be at higher risk of vandalism with additional visitation


Photo by Kelley Savage

3.2 Natural and Cultural Resource Management

Vegetation Management

Devil's Backbone Open Space is a matrix of grasslands, shrubs, riparian areas and ponderosa pine woodlands. The condition of the shrublands is excellent, and no additional management activities are suggested in this plant community. The condition of the first order riparian areas and the ponderosa pine community is unknown and additional monitoring of these plant communities is needed to prescribe management activities that could improve biotic integrity.

The condition of much of the grassland community is poor. Devil's Backbone Open Space has been used intermittently for cattle and horse grazing over the past 100 years, resulting in the introduction of invasive grasses such as feral rye, smooth brome and cheatgrass. Cheatgrass and feral rye have been managed through the use of prescribed fire and herbicides, with mixed results. In portions of the Indian Creek Valley, Larimer County was able to reduce the percentage of cheatgrass from over 80% to less than 10% over a four year period, using the combination of prescribed fire and herbicides. However, in recent surveys of the same valley, invasive grasses have spiked to 30% of the canopy.

Vegetation Management Actions

- Continue partnering with CNHP to monitor all tracked species and communities
- Continue monitoring all common plant communities to assess health and prescribe appropriate management actions
- Continue implementing adaptive, integrated weed control measures.
- Update the Cheatgrass Management Plan to reflect current conditions of the Indian Creek and west Milner Mountain Valley Area and prescribe appropriate actions
- Where feasible, return natural processes, such as fire, to the landscape to create and sustain healthy plant communities
- Avoid driving abandoned and revegetated roads
- Design any future trails to avoid fragmenting rare plants and sensitive plant communities
- Work closely with utility companies to avoid impacting healthy plant communities and restore using Best Management Practices

Wildlife Management

There are several sensitive wildlife species, including nesting and hunting raptors, currently present at Devil's Backbone Open Space. In addition, the area is included in a larger mule deer winter concentration area and includes two black-tailed prairie dog colonies. Rare butterflies inhabit the open space and rattlesnakes are observed from March-October and can be dangerous. Management actions are needed to protect wildlife habitat and ensure public safety.

Photo by Charlie Johnson

Wildlife Management Actions

- Continue monitoring the prairie dog colonies
- Continue raptor nest monitoring
- Continue butterfly monitoring
- Close the Keyhole Trail if nesting raptors are observed in the Keyhole area
- Provide education regarding rattlesnake ecology and visitor safety
- Locate any new trails to avoid sensitive wildlife habitat

III. Management Plan

Cultural Resource Management

Devil's Backbone Open Space has a rich cultural history, from use by Native Americans for hunting to the development of the site for mining, manufacturing and agricultural purposes. Relics of these former land uses still exist and require special attention.

Cultural Resource Management Actions

- Enlist an archaeologist to walk any proposed trails and give clearance for any potential archaeological areas of significance
- Locate any new trails away from archaeological and historical features
- Annually assess the condition of archaeological/historical features, such as the hunting blind
- Enforce looting and vandalism regulations to protect removable historic items, such as railroad spikes

3.3 Visitor Management

Based on a trail counter installed near the Devil's Backbone Trailhead, more than 70,000 visitors are expected to access the open space in 2014. Hiking, mountain biking and horseback riding are allowed on designated trails; and facilities were developed to accommodate these uses and protect surrounding natural and cultural resources.

New Hidden Valley Trail

The Wild Loop Trail is the only northbound trail from the Devil's Backbone Trailhead and requires all visitors to share the same 4-foot wide trail. During

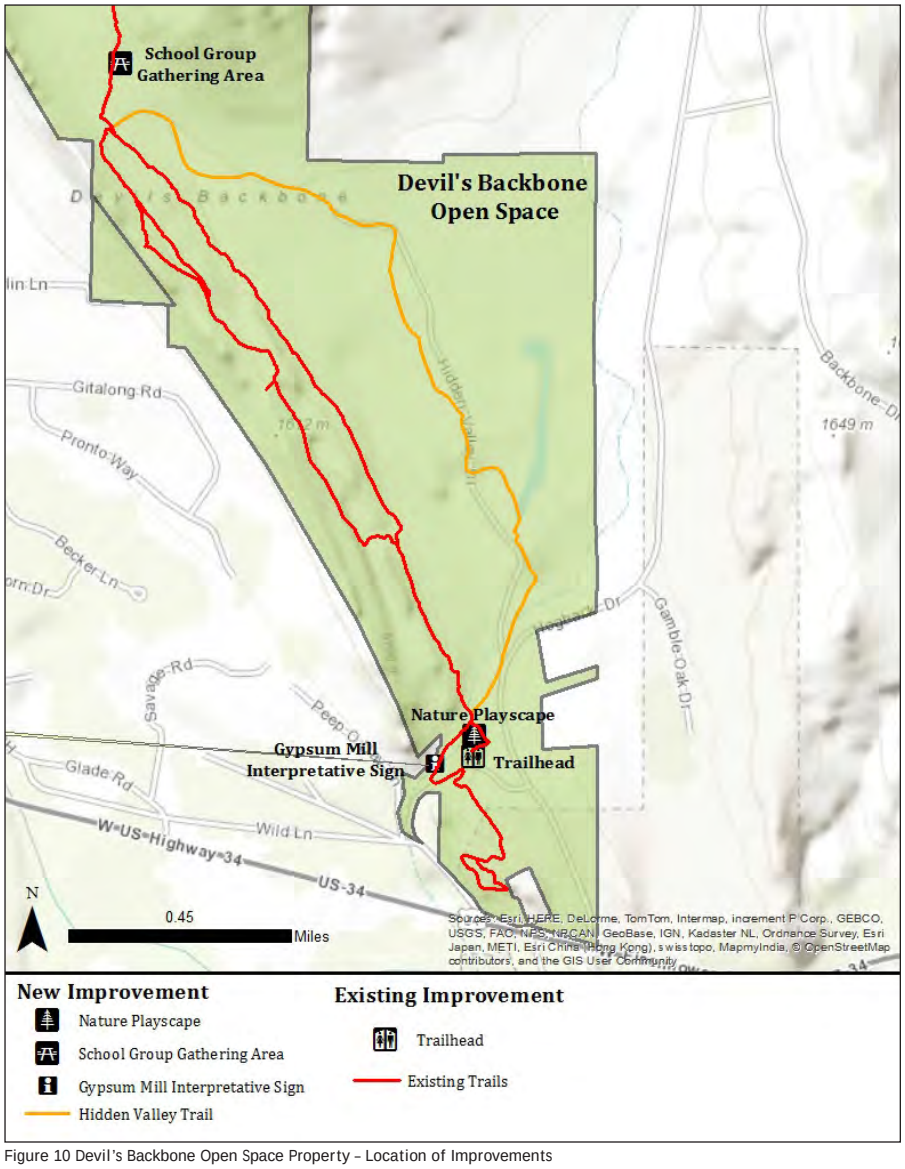

Figure 10 Devil's Backbone Open Space Property – Location of Improvements

busy weekends when the trailhead is full and visitors park along Hidden Valley Lane, more than 150 visitors share the trail at one time. This level of use is not sustainable for the Wild Loop Trail. Social trails have formed in the area, the trail is widening and, with additional visitation, the visitor experience could decline.

A new 1.3-mile Hidden Valley Trail will be built in the Hidden Valley II property to separate uses and relieve congestion on the Wild Loop Trail. Figure 10 shows the location of this trail.

The Hidden Valley II property was purchased in 2003 for its scenic, wildlife, educational and recreational values. This property has been significantly altered in the last century with large pits, spoil piles, rail lines and a dynamite bunker indicating heavy mining use. A survey of critical biological resources was conducted in 2014 by CNHP to ensure the wildlife habitat and environmental resources located on the Hidden Valley II property would not be impacted by a new trail.

Photo by Jeffrey Boring

The report found a small pond that serves as a breeding ground for three amphibian species, remnant tall grass prairie patches, an imperiled plant community and a State and globally vulnerable plant. No threatened or endangered species were observed and the habitat needed to support Preble's meadow jumping mouse was not observed.

A geologic hazard assessment was completed to determine the safety of the gypsum pits and if public access should be allowed in them. The report found evidence of landslides and unstable walls. Although the floors of the pits appear stable, there is no long-term assurance of their safety (Stewart Environmental Consultants, Inc., 2014). Public access into the pits has been deemed unsafe and therefore will be restricted.

In the past, some of these pits have been used as an unregulated dump. Both woody debris and garbage have been placed in them. Prior to the purchase of the Hidden Valley property, garbage was removed from the pits and woody debris was buried. A Phase I Environmental Assessment was completed and no hazardous waste or environmental contaminants were found. The Colorado Department of Public Health and the Environment declared the site safe, that no surface water or ground water contamination occurs and that no additional mitigation or remediation efforts are needed (Stewart Environmental Consultants, Inc., 2002).

The area around the pits is safe. Therefore the recreational values of the property can be enhanced by building a trail without damaging critical biological resources or endangering the public. In fact, Colorado Parks and Wildlife cleared the proposed Hidden Valley Trail alignment and found that the trail would not displace wildlife or habitat (Appendix D).

III. Management Plan

The Hidden Valley Trail will be multi-use allowing hiking, equestrian use, and mountain biking. The Wild Loop Trail will be converted to foot traffic only. Separating mountain biking and equestrian uses from hiking use is expected to provide a more fulfilling experience for all user groups.

Devil's Backbone Open Space visitors were surveyed about the proposed new trail and designating the Wild Loop Trail as foot traffic only. One hundred percent of the respondents supported building the Hidden Valley Trail and 84% supported making the Wild Loop Trail foot traffic only.

Hiking

Based on observed use over the past 15 years, and confirmed in the surveys completed during the development of this management plan, hiking is the most common activity at Devil's Backbone Open Space. Sixty-one percent of the survey respondents identified themselves primarily as hikers or trail runners and 10.7% indicated they were both hikers and bikers. All 15 miles of trail located at Devil's backbone Open Space are open to hiking and trail running.

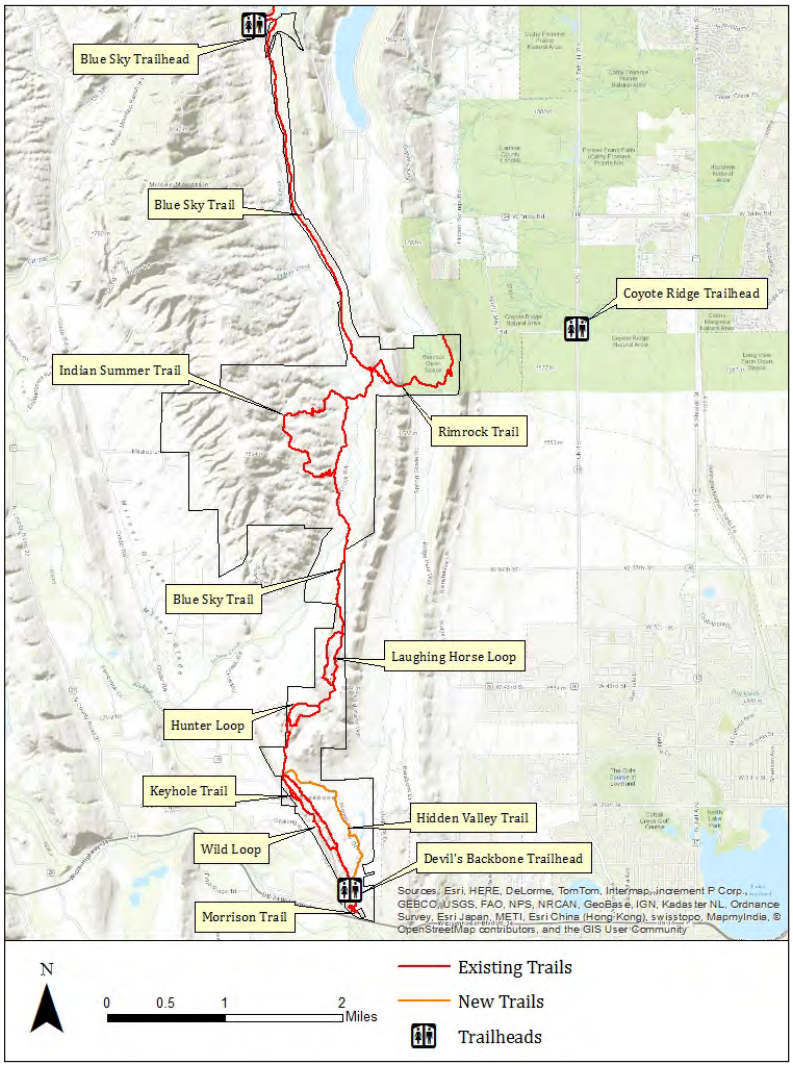

Figure 11 Devil's Backbone Open Space Property – New and Existing Trails

Devil's Backbone Open Space provides a variety of hiking opportunities, from long day trips where visitors hike from one trailhead to another, to short loop hikes. The Wild Loop is the most popular trail section because it is short (1.7 miles), easy and leads to the Keyhole Feature, a 20-foot tall opening in the backbone that provides outstanding views west to the foothills and Rocky Mountain peaks.

Devil's Backbone will continue to be managed to provide a variety of hiking opportunities. The Wild Loop, due to its popularity and proximity to the trailhead, will be managed as a front country trail and may contain more built features such as benches and interpretative signs than the more remote trails.

Figure 11 illustrates the location of the existing trail system as well as the new trail through Hidden Valley.

Mountain Biking

Mountain biking is the second most popular recreation activity at Devil's Backbone Open Space, based on observations over the past 15 years and surveys completed during the development of this management plan. Twenty-three percent of Devil's Backbone visitors surveyed identified themselves primarily as mountain bikers and another 11% identified themselves as both hikers and mountain bikers.

Mountain biking at Devil's Backbone Open Space ranges from easy to difficult. The easiest sections are located along the Blue Sky Trail from County Road 38E to the intersection with the Rimrock Trail. The hill below the Hunter Loop (locally known as Heart Attack Hill), the terrain through Laughing Horse Loop and north into Indian Creek Valley are the rockiest and most difficult sections of trail.

Once the new trail through Hidden Valley is constructed, 13.5 miles of trail will be accessible for mountain bikers. Mountain biking will not be permitted on the following trails: the entire Wild Loop (1.7 miles), the Keyhole Trail (0.2 miles), the Morrison Trail (0.6 miles) and the upper Hunter Loop (0.3 miles).

Horseback Riding

Of the permitted recreation activities at Devil's Backbone Open Space, horseback riding is the least popular, based on observation by open space rangers. This was confirmed during the survey completed for this management planning process. Five percent of survey responders identified themselves as equestrians. The trailer parking stalls located at the Devil's Backbone Open Space trailhead are rarely full and often converted to car stalls during a busy weekend or used by buses during school group events.

Based on feedback from the equestrian community, there are many reasons why Devil's Backbone Open Space is an unpopular horseback riding destination. The open space is located on a rocky hogback and much of the terrain is difficult for an equestrian to negotiate. The section of the Blue Sky Trail that descends from the ridge into the Indian Creek Valley is steep and rocky and required the construction of walls to make the trail more sustainable and safe. Similarly, the trail descending from the eastern hogback on the Rimrock Property has been re-built in consultation with equestrian groups to try to improve the equestrian experience. However, despite these improvements, horseback riding on many sections of trail is challenging due to topographical constraints.

Photo by Judy Swenson

More desirable equestrian trails also exist nearby. Fort Collins' Bobcat Ridge Natural Area is a more popular equestrian destination because the trails are less technical and some trails are equestrian or hiking and equestrian use only. Horsetooth Mountain Open Space and Lory State Park are also popular equestrian destinations in the area.

III. Management Plan

Once the new trail through Hidden Valley is constructed, 13.8 miles of trail will be accessible for equestrians. Equestrian access is not permitted on the following trails: the entire Wild Loop (1.7 miles), the Keyhole Trail (0.2 miles) and the Morrison Trail (0.6 miles).

Other Recreation Activities

The residents of Larimer County are avid and creative outdoor recreationists. Over the last 20 years, mountain biking, fat biking, snowboarding and sport climbing have gone from rare, extreme sports to common recreation activities in some parts of Larimer County. In the future, Devil's Backbone Open Space may be a desirable destination for residents to try the *next* non-motorized recreation activity. Demand for traditional recreation activities, like hunting, may increase as well. Larimer County will review each requested activity separately and permit activities that do not impact existing recreation, natural or cultural resources.

Dogs

Dogs are allowed at Devil's Backbone Open Space, except for the Rimrock Trail. Dogs must be on leash and under control at all times. Keeping pets on leash prevents the harassment of wildlife and ensures a safe experience for all users. Owners are responsible for removing dog excrement and pick up bags are available at the trailheads.

Dogs are not allowed on the Rimrock Trail for management consistency with Fort Collins' neighboring Coyote Ridge Natural Area.

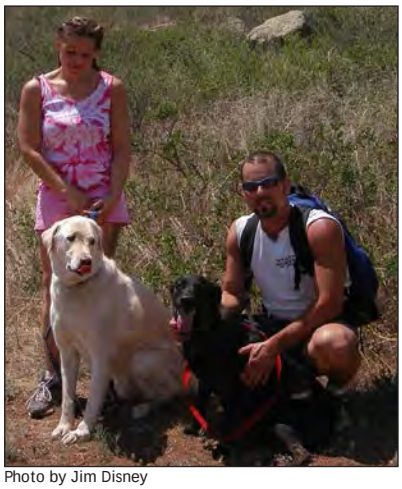

Photo by Jim Disney

Morrison Trail

The Morrison Trail is a unique trail in Larimer County's trail system. This trail was designed to highlight the geological features found throughout the open space and is designed to be wheelchair accessible. This natural surface trail meets the USFS accessibility standards, including 5% grade or less, 8.33% grade up to 200 feet, or 10% up to 30 feet, trail width at least 36 inches and passing space 60 inches wide every 1,000 feet.

Devil's Backbone Trailhead

The Devil's Backbone Trailhead has been reconfigured a few times since the property was opened for public access in 1999. The current Devil's Backbone Trailhead was built in 2003 and contains 64 vehicle parking stalls and five horse trailer stalls. On weekends and holidays, the parking lot is often full and visitors park along Hidden Valley Lane. Hidden Valley Lane is owned by Larimer County and is not designed or designated for parking. The shoulders are not paved and no parking bumpers are installed or parking lines marked.

Larimer County also has an agreement with the Hidden Valley HOA to allow residents to use Hidden Valley Lane as the primary residential access. Parking along Hidden Valley Lane

can be a nuisance and a safety concern for both residents and Devil's Backbone Open Space visitors.

Ripley Design, Inc. was hired in 2014 to evaluate the existing Devil's Backbone Trailhead and develop two conceptual designs that would accommodate an additional 35 vehicles. Thirty-five additional vehicles approximates the number of cars that park along Hidden Valley Lane when the trailhead is full.

Reconfiguring the parking lot will accommodate existing parking demand and relocate parking from Hidden Valley Lane to the parking lot. Once the trailhead is reconfigured, a total of 99 parking spaces will be available for visitors. The reconfigured lot is the buildout for this trailhead, as additional parking will further degrade natural resources and compromise visitor experience. Larimer County will also sign Hidden Valley Lane as "No Parking" and cite illegally parked vehicles on the road.

Two conceptual trailhead designs were produced and displayed at each public meeting, intercept event, the site visit with the Technical Advisory Committee, a meeting with the Loveland Open Lands Commission and a meeting with Hidden Valley residents. The compact trailhead concept that reduces the area of disturbance was consistently preferred (Figure 12). This option also includes a reduction in horse trailer stalls from five to three, based on the lack of use of Devil's Backbone Open Space by equestrians.

During the survey completed for this management planning process, 88% of survey respondents supported reconfiguring the trailhead to add parking stalls and prohibit parking on Hidden Valley Lane.

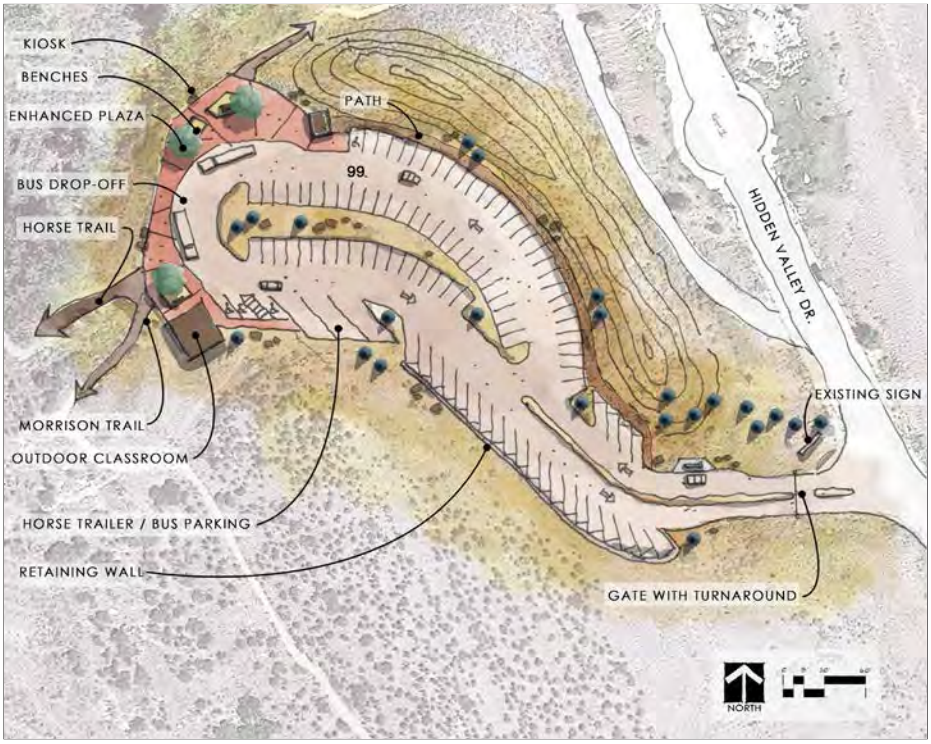

Figure 12 Copnceptual Trailhead Design

Future Trailhead

Three trailheads provide public access to Devil's Backbone Open Space: Devil's Backbone Trailhead on the south, Fort Collins' Coyote Ridge Trailhead on the east and the Blue Sky Trailhead on the north. Additional land protection and trail development are needed to meet growing recreation demand. The capacity issues experienced at Devil's Backbone Open Space are common at Horsetooth Mountain Open Space, Coyote Ridge Natural Area and other public lands along the Front Range.

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To meet this demand, a western Devil's Backbone Trailhead is desirable. The 2004 Devil's Backbone Open Space Management Plan highlighted the interest to build a future western trailhead, located on the southwest portion of the Indian Creek Property. A trail system would be built to connect the new trailhead with the Indian Summer or Blue Sky trails on the east side of Milner Mountain. The primary constraint to providing a western trailhead is lack of legal access to the open space.

New Keyhole Parcel

Larimer County acquired a 6.88-acre parcel that abuts the west side of the Keyhole in November 2014. The parcel comprises the immediate foreground to the western vista through the Keyhole. In addition to the scenic benefits, it provides a buffer from neighboring development, provides wildlife habitat, and protects geological features.

Photo by Charlie Johnson

Recreational use of the parcel will be determined through a site assessment, needs evaluation and coordination with neighboring landowners. The site could potentially be accessed by the public from the Keyhole Trail and through the Keyhole feature to serve as an informal gathering area for education and general public use. The parcel cannot be accessed by the general public from adjacent roads due to lack of public right of way. The site could also be managed as a buffer to the Keyhole area, where raptors occasionally nest.

Management Area Designations

Devil's Backbone Open Space is divided into two management zones: a frontcountry area and a backcountry area. They were developed based on visitor experience, proximity to the trailheads, natural and cultural resources and level of development. The frontcountry zone is defined by higher levels of development such as frequent interpretative signs, benches, kiosks, vault toilets, shelters and other hardened areas. The Wild Loop Trail and Morrison Trail are the two trails that are designated as frontcountry trails. The three trailheads are also considered frontcountry areas.

The remainder of Devil's Backbone Open Space is more remote, receives less visitor use and provides critical habitat. Therefore, additional improvements may not be needed or appropriate. All areas of Devil's Backbone Open Space outside of the Wild Loop Trail, Morrison Trail and the three trailheads are designated as backcountry areas.

Visitor Management Actions

- Work with mountain bike and equestrian community to design the Hidden Valley Trail
- Pursue grant funding to help fund new trail and trailhead construction

- Finalize Devil's Backbone Trailhead design
- Construct new trail and trailhead improvements
- Sign the Wild Loop Trail as foot traffic only and patrol regularly
- Publicize the new trail, trailhead reconfiguration and changes in use of the Wild Loop Trail
- Sign Hidden Valley Lane as "No Parking" and cite illegally parked vehicles
- Monitor the condition of all trails and complete regular maintenance per Larimer County Natural Resources trail standards
- Harden Wild Loop Trail as needed to prevent erosion
- Continue to notify visitors of alternative recreation destinations to reduce capacity issues
- Explore methods of educating visitors about trailhead capacity before arrival
- Evaluate and repair the Highway 34/Hidden Valley Lane intersection
- Review requests for new non-motorized recreation activities that do not impact existing recreation, natural or cultural resources
- Work with neighborhoods to the west of Indian Creek to determine the feasibility and potential for a future western trail connection
- Pursue legal access from Glade Road and the development of a new western trailhead
- Continue to patrol and enforce open space rules and regulations

3.4 Education Plan

Devil's Backbone Open Space is one of Larimer County's most popular destinations for outdoor education. Larimer County works closely with the Thompson and Poudre School Districts providing field trips for more than 1,000 Pre-K – 12th grade students at Devil's Backbone Open Space, in a given year. The subject matter for these hikes correlates with Colorado Academic Standards, with a focus on geology, wildlife and cultural history.

The Backbone is also used by college students each year. The geological value of Devil's Backbone is unparalleled and students and their instructors come from Colorado State University, University of Colorado, University of Northern Colorado and as far away as Colorado Springs to study the exposed geologic formations.

Key Interpretative Messages

The geology, history and wildlife of Devil's Backbone Open Space distinguish it from other public lands and provide the foundation for the key interpretative messages that are shared with open space visitors. The key messages include:

- Visitors should enjoy Devil's Backbone but need to be aware of their surroundings and specific risks of hiking in the foothills of Colorado, including rattlesnakes.

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- Devil's Backbone Open Space provides unique opportunities for understanding the geology of the Front Range of the Rocky Mountains.
- Devil's Backbone Open Space represents significant portions of Loveland's local history including the entrepreneurial spirit of Alfred Wild and Mariano Medina.

These messages are conveyed in a variety of ways, including the trailhead kiosk, use of interpretative signs and brochures, naturalist-led programs, school field trips, online tools and social media feeds.

Target Audiences for Interpretive Signs

Interpretative signs provide an important dimension to the visitor experience by telling stories and directing attention to an aspect of the property. Existing signs at Devil's Backbone tell the story of historical figures, colorful rock formations and mountain peaks.

These signs are not designed for all visitors and future signs will need to be targeted for specific audiences.

New interpretative signs will be designed for walkers, hikers and families. These users move at a pace that is conducive to stopping frequently and reading. Mountain bikers, equestrians, and trail runners are not target audiences for wayside signs. These users are on the move and generally do not stop to read interpretative signs.

Since the Wild Loop will be designated as foot-traffic only, additional interpretative signs may be installed here. No interpretive elements will be planned for the Hidden Valley Trail since it will be designed for mountain biking.

Banner and Tagline

Branding an open space with a banner and tagline is important; it helps reinforce the key interpretative messages and establishes site identity. A banner is an artistic adaptation of a defining characteristic of the property and for Devil's Backbone Open Space, it will likely include the outline of the Devil's Backbone formation. A tagline is a short, memorable narrative of the property. An example of a possible Devil's Backbone Open Space tagline is *Loveland's History, Written in Stone*. Devil's Backbone Open Space does not have a banner and tagline and as existing signs are replaced they will be updated to include a banner and tagline for the site.

Photo by Rick Price

Naturalist Programming

In addition to self-guided tours, Larimer County offers hikes led by trained Volunteer Naturalists. These volunteers complete a 5-week training program and provide 30-40 free, guided hikes throughout the year. Topics include wildlife, wildflowers and geology. Programs typically draw 5-15 participants and are 2 hours in length.

Trailhead Tables are another naturalist-led interpretative opportunity. Naturalists set up a table at a trailhead with a specific topic or theme, such as rattlesnakes, horses or human/wildlife interactions. These tables are a great way to interact with many people and to address a specific management issue or educational objective.

Tiny Trekkers is a program designed for 2-5 year olds and currently takes place at the picnic tables on the Wild Loop. Tiny Trekkers programs occur 1-2 times each month and focus on building empathy for and exploring the natural world. Topics include local plants and animals and other age-appropriate lessons.

Nature Playscape

Nature Playscapes were identified as a recommendation in Larimer County's 2012 Plug in to Nature study, to help address the gap between children and the natural world. A Nature Playscape is an open area where kids can participate in unstructured nature play. Playing in the dirt, stacking rocks, collecting insects and building forts are activities that help form critical thinking skills, develop love and enjoyment for nature and build confidence and social skills. A Nature Playscape area is planned for the Wild Loop picnic area, just north of the trailhead.

This picnic area is already being utilized by families for nature play and exploration. The Nature Playscape will include the addition of natural features that encourage play such as rocks, logs and berms, or other minor topographical features. Areas for digging and creative mowing to add "rooms" are also a possibility. Layout of additional logs can encourage the building of forts and other temporary structures. There is no water in this area so water features and additional plantings will be avoided.

New School Group Gathering Area

The Wild Loop is a popular area for school field trips and a gathering area is needed on the north end of the loop. Currently, large school groups are broken into smaller groups at the outdoor classroom and disperse across the Wild Loop Trail. Multiple areas are needed to allow children to congregate, eat lunch and interact. The Keyhole Formation area, Playscape and outdoor classroom can serve as gathering areas. The school groups often turn around at the north end of the Wild Loop to head back to the trailhead. This is a logical place to add an improved gathering area and is already disturbed due to off-trail use. This area will be improved with local boulders, to provide a new gathering area.

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Future Interpretative and Kiosk Signs

Interpretative signs are an asset in telling Devil's Backbone Open Space's story. Additional signs are needed to highlight the historical use and wildlife of the property, including:

- History of Alfred Wild - two 24x36 high pressure laminate signs
  - General history of the Wild family and gypsum mill (to be located along the trail near the existing gypsum mill foundation)
    - Gypsum mine and 2-gauge railroad (to be located on the west side of the Wild Loop Trail where visitors can get a good view of Hidden Valley - consideration will be taken to place sign as to not disrupt scenic resources or flow of traffic)
    - If a need arises to label the powder cache on the new Hidden Valley Trail, a small label sign there could also be utilized.
- Recommendations for existing signs
  - When Mariano Medina sign is replaced, consider redesigning to reflect design standards of Alfred Wild sign
  - Replace Backbone Born from the Rockies geology sign to correct information that is not factual and change placement
  - Update kiosk to reflect new branding (banner, tagline, etc.). Overall design of kiosk itself should reinforce that brand
  - New rotating signs on the kiosk to reflect management/resource concerns and new interpretive opportunities
    - Winter: General cultural history sign - Alfred Wild (possibly include Mariano Medina)
    - Spring: Wildflowers
    - Summer: Summer hiking safety, rattlesnakes and heat exhaustion
    - Fall: Geology

Larimer County staff will evaluate interpretive signs annually, with ad hoc evaluation due to vandalism or other damage. Signs will be replaced every 8 years or sooner if damage occurs.

Public Safety and Access Messaging

In addition to the geological and natural history lessons Devil's Backbone offers, the public needs to be updated on changing conditions that may affect a visitor's use and enjoyment of the open space. The Devils' Backbone Trailhead can fill up quickly or close due to muddy conditions. Social media is used to encourage visitation at off-peak times of day, provide education on new parking regulations or alert subscribers to a trail closure.

Devil's Backbone Open Space provides excellent rattlesnake habitat and many rattlesnakes are seen each year by staff and visitors. A kiosk sign will focus on the life history of rattlesnakes, visitor situational awareness and trail safety. Heat exhaustion (human and

canine) is also a concern and a kiosk sign will focus on avoiding the hottest times of day in summer, dressing in layers, bringing water and wearing a hat.

Online Resources and Social Media

Devil's Backbone Open Space has a Site Page as well as a current conditions page on the Larimer County Natural Resources Department's website. Each page provides information about the property including location and directions, hours of operation and recreation opportunities. The Site Page includes maps, regulations and management plan notes. The Current Conditions Page includes up to date information about the condition of the site and trails, general information about Devil's Backbone Open Space and links to social media feeds.

Social media has become an important tool in notifying the public about trail closures and promoting recreation. Field staff communicates Devil's Backbone Open Space conditions including trails and the capacity of the parking lots via the Natural Resource Department's Facebook page and Twitter feeds. These feeds are the most up to date information about the current conditions of the site.

Mobile applications provide a new dimension to experiencing Devil's Backbone Open Space. Geo-referencing PDF maps are available for users to download and use in 3rd Party Map applications. Geo-referencing PDF maps are available via the Larimer County Natural Resources Department website.

Evaluation of Education Program

A successful education program includes an evaluation tool that allows Program Managers to adjust programs to achieve success. The following tools will be used to assess the Education Program:

- Interpretive Signs
  - o Set up tables at trailhead to collect feedback from trail users on a weekend
- Naturalist Programs
  - o Currently, a summary evaluation is conducted through Google forms (https://docs.google.com/a/co.larimer.co.us/forms/d/1j04-ehHS8qeuFkdLBl8XCBOCt9xR1B89g9KrkmdGdR8/viewform)
- School Groups
  - o School groups are evaluated through formative assessments including informal feedback from teachers
- Nature Playscape
  - o Develop a method for tracking use and work with the academic community to measure success in developing interest in nature play

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Education Plan Actions

- Continue working with the Poudre and Thompson School Districts to promote Devil's Backbone as an outdoor learning and field trip destination
- Continue training Volunteer Naturalists and schedule guided hikes and Trailhead Table events
- Continue the Tiny Trekkers Program
- Work with staff and the Open Lands Advisory Board to develop a Devil's Backbone banner and tagline
- Fabricate and install new interpretative and kiosk signs; replace signs as needed

Photo by Patricia Brennan

- Pursue a grant to help fund the new School Group Gathering Area, interpretive amenities and Nature Playscape
- Design and construct the School Group Gathering Area and Nature Playscape to provide off-trail recreation activities for youth
- Monitor off-trail use areas and harden or adapt to improve safety and avoid undesirable resource damage
- Regularly inspect interpretative signs for vandalism, replace/repair as needed
- Coordinate field trips to utilize existing restroom facilities
- Continue with website updates, social media feeds and new technology that provides better visitor services
- Evaluate education programs

3.5 Management Plan Implementation

The Devil's Backbone Management Plan Update will go into effect upon adoption by the Natural Resources Director. Changes in regulations, such as the dedication of the Wild Loop Trail as foot-traffic only, will go into effect at a future date, when the new Hidden Valley Trail is built. A summary of each management action and timeline for implementation is found in Appendix A.

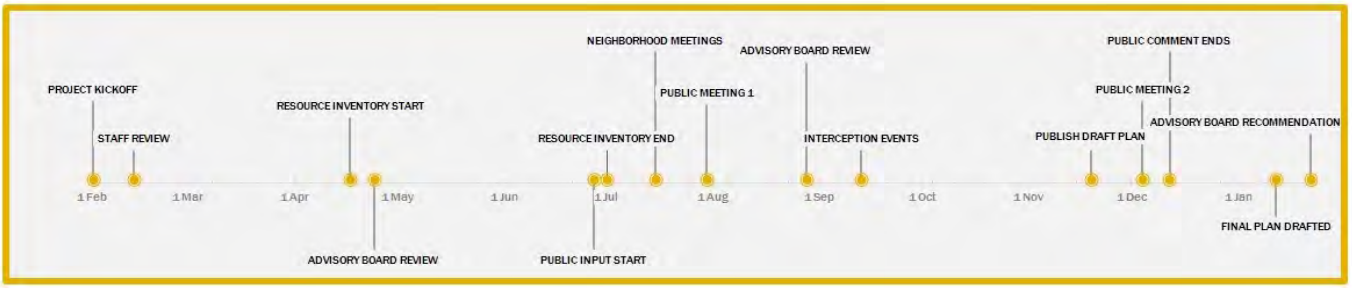

Figure 1. Devil's Backbone Management Plan Update Schedule

4.1 APPENDIX A

Devil's Backbone Open Space Management Plan Implementation Steps

Implementation Steps	Material or Contract Cost Estimate	2015	2016	Beyond 2016
Vegetation Management				
Work with CNHP to monitor all tracked species and communities	$3,000			As needed
Monitor all common plant communities to assess health and prescribe appropriate management actions	$0	X	X	Annually
Implement adaptive, integrated weed control measures	$0	X	X	Annually
Update the Cheatgrass Management Plan to reflect current conditions of the Indian Creek and west Milner Mountain Valley Area and prescribe appropriate actions	$15,000		X	
Return natural processes, such as fire, to the landscape to create and sustain healthy plant communities	$0			As feasible
Avoid driving abandoned and revegetated roads	$0	X	X	Annually
Design any future trails to avoid fragmenting rare plants and sensitive plant communities	$0			As needed
Work closely with utility companies to avoid impacting healthy plant communities and restore using Best Management Practices	$0	X	X	As needed
Wildlife Management				
Monitor raptor nests	$0	X	X	Annually
Monitor imperiled butterflies	$5,000			Triennially
Close trails as needed, if raptors nest nearby	$0	X	X	Annually
Provide education regarding rattlesnake ecology and visitor safety	$0	X	X	Annually

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Implementation Steps	Material or Contract Cost Estimate	2015	2016	Beyond 2016
Locate any new trails to avoid sensitive wildlife habitat	$0	X	X	Annually
Cultural Resource Management				
Enlist an archaeologist to walk any proposed trails and give clearance for any potential archaeological areas of significance	$0	X	X	As needed
Locate any new trails away from archaeological and historical features	$0	X	X	As needed
Annually assess the condition of archaeological/ historical features, such as the hunting blind	$0	X	X	Annually
Enforce looting and vandalism regulations to protect removable historic items, such as railroad spikes	$0	X	X	Annually
Visitor Management				
Work with mountain bike and equestrian community to design the Hidden Valley Trail	$0	X		
Pursue a grant to help fund new trail and trailhead construction	$0		X	
Finalize Devil's Backbone Trailhead design	$5,000	X		
Construct new trail and trailhead improvements	$125,000			2017
Sign the Wild Loop Trail as foot traffic only and patrol regularly	$500			2017

Implementation Steps	Material or Contract Cost Estimate	2015	2016	Beyond 2016
Publicize the new trail, trailhead reconfiguration and changes in use of the Wild Loop Trail	$0			2017
Sign Hidden Valley Lane as “No Parking” and cite illegally parked vehicles	$500			2017
Monitor the condition of all trails and complete regular maintenance per Larimer County Natural Resources trail standards	$0	X	X	X
Harden Wild Loop Trail as needed to prevent erosion	$2,000			X
Notify visitors of alternative recreation destinations to reduce capacity issues	$0	X	X	X
Explore methods of educating visitors about trailhead capacity before arrival	$0	X	X	X
Evaluate and repair the Highway 34/Hidden Valley Lane intersection	$5,000	X		
Review requests for new non-motorized recreation activities and impact on existing recreation, natural or cultural resources	$0	X	X	X
Work with neighborhoods to the west of Indian Creek to determine the feasibility and potential for a future western trail connection	$0			X
Pursue legal access from Glade Road and the development of a new western trailhead	Unknown			X
Patrol and enforce open space rules and regulations	$0	X	X	X

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Implementation Steps Education Plan	Material or Contract Cost Estimate	2015	2016	Beyond 2016
Work with the Poudre and Thompson School Districts to promote Devil's Backbone as an outdoor learning and field trip destination	$0	X	X	X
Train Volunteer Naturalists and schedule guided hikes and Trailhead Table events	$1,000	X	X	X
Coordinate the Tiny Trekkers Program	$0	X	X	X
Work with staff and the Open Lands Advisory Board to develop a Devil's Backbone banner and tagline	$0	X		
Pursue a grant to help fund the new School Group Gathering Area, interpretive amenities and Nature Playscape	$0		X	
Fabricate and install new interpretative and kiosk signs; replace signs as needed	$18,000			X
Design and construct the School Group Gathering Area and Nature Playscape to provide off-trail recreation activities for youth	$17,000			X
Monitor off-trail use areas and harden or adapt to improve safety and avoid undesirable resource damage	$0			X
Regularly inspect interpretative signs for vandalism, replace/repair as needed	$900	X	X	X
Coordinate field trips to utilize existing restroom facilities	$0	X	X	X
Continue with website updates, social media feeds and new technology that provides better visitor services	$200	X	X	X
Evaluate education programs	$0	X	X	X

4.2 APPENDIX B: Species Lists

Table 1: Wildlife species observed or likely present at Devil's Backbone Open Space

Common Name	Scientific Name
Mammals	
Coyote	*Canis latrans*
Elk	*Cervus canadensis*
Golden-mantled ground squirrel	*Citellus lateralis*
Rock squirrel	*Citellus variegatus*
Black-tailed prairie dog	*Cynomys ludovicianus*
Porcupine	*Erethizon dorsatum*
Least chipmunk	*Eutamias minimus*
Uinta chipmunk	*Eutamias umbrinus*
Mountain lion	*Felis concolor*
Striped skunk	*Mephitis mephitis*
Prairie vole	*Microtus ochrogaster*
Mexican woodrate	*Neotoma mexicana*
Mule deer	*Odocoileus hemionus*
White-tailed deer	*Odocoileus virginianus*
Hispid pocket mouse	*Perognathus hispidus*
Rock mouse	*Peromyscus difficilis*
Deer mouse	*Peromyscus maniculatus*
Raccoon	*Procyon lotor*
Mountain cottontail rabbit	*Sylvilagus nuttalli*
Black bear	*Ursa americanus*
Red fox	*Vulpes fulva*
Birds and Raptors	
Grasshopper sparrow	*Ammodramus savannarum*
Red-tailed hawk	*Buteo jamaicensis*
Goldfinch species	*Carduelis spp.*
Turkey vulture	*Cathartes aura*
Lark sparrow	*Chondestes grammacus*

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Common Name	*Scientific Name*
Common Raven	*Corvus corax*
Blue grosbeak	*Guiraca caerulea*
Barn swallow	*Hirundo rustica*
Bullock's oriole	*Icterus bullockii*
Northern mockingbird	*Mimus polyglottos*
Lazulie bunting	*Passerina amoena*
Cliff swallow	*Petrochelidon pyrrhonota*
Spotted towhee	*Pipilo maculatus*
Black-capped chickadee	*Poecile atricapilla*
Vesper sparrow	*Pooecetes gramineus*
Rock wren	*Salpinctes obsoletus*
Brewer's sparrow	*Spizella breweri*
Eurasian-collard dove	*Streptopelia decaocto*
Western meadowlark	*Sturnella neglecta*
American robin	*Turdus migratorius*
Mourning dove	*Zenaida macroura*
Amphibians	
Western tiger salamander	*Ambystoma mavortium*
Woodhouse's toad	*Anaxyrus woodhousii*
Boreal chorus frog	*Pseudacris maculata*
Reptiles	
Six-lined Racerunner Lizard	*Aspidoscelis sexlineatus*
North American Racer	*Coluber constricto*
Prairie rattlesnake	*Crotalus viridis*

Table 2: Plant species observed or likely present at Devil's Backbone Open Space

Common Name	*Scientific Name*
Grasses	
Indian Rice Grass	*Achnatherum hymenoides*
Scribner's Needlegrass	*Achnatherum scribneri*
Crested Wheatgrass	*Agropyron cristatum*
Western Wheatgrass	*Agropyron smithii*
Big Bluestem	*Andropogon gerardii*
Purple Three-awn	*Aristida purpurea*
Fork-tipped Three-awn	*Aristida basiramea*
Side-oats Grama	*Bouteloua curtipendula*
Blue Grama	*Bouteloua gracilis*
Smooth Brome	*Bromus inermis*
Japanese Brome	*Bromus japonicus*
Cheatgrass	*Bromus tectorum*
Orchard Grass	*Dactylis glomerata*
Squirrel Tail	*Elymus longifolius*
Slender Wheatgrass	*Elymus trachycaulus*
Prairie Junegrass	*Koeleria macrantha*
Spike Fescue	*Leucopoa kingii*
Perennial Rye	*Lolium perrenne*
Indian Ricegrass	*Oryzopsis hymenoides*
Timothy Grass	*Phleum pratense*
Canada Bluegrass	*Poa compressa*
Kentucky Bluegrass	*Poa pratensis*
Little Blue Stem	*Schizachyrium scoparium*
Common Rye	*Secale cereale*
Needle-and-Thread	*Stipa comata*
New Mexico Feathergrass	*Stipa neomexicana*
Green Needle	*Stipa viridula*

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Common Name	*Scientific Name*
Sedges	
Water Sedge	*Carex aquatilis*
Grassyslope sedge	*Carex oreocharis*
Rocky Mountain sedge	*Carex saximontana*
Shrubs	
Mountain Mahogany	*Cercocapus montanus*
Rabbitbush	*Chrysothamnus nauseosus*
Broom Snakeweed	*Gutierrezia sarothrae*
Chokecherry	*Prunus virginiana*
Slim Scurfpea	*Psoralidium tenuiflorum*
Skunkbush	*Rhus trilobata*
Wax Currant	*Ribes cereum*
Western Snowberry	*Symphoricarpos occidentalis*
Mountain Snowberry	*Symphoricarpos oreophilus*
Trees	
Russian Olive	*Elaeagnus angustifolia*
Rocky Mountain Juniper	*Juniperus scopulorum*
Ponderosa Pine	*Pinus ponderosa*
Plains Cottonwood	*Populus deltoides*
Succulents	
Barrel Cactus	*Coryphantha sp.*
Prickly Pear	*Opuntia polyacantha*
Forbs	
Yarrow	*Achillea lanulosa*
Wild Blue Flax	*Adenolinum lewisii*
Lavender hyssop	*Agastache foeniculum*
Wild Onion	*Allium textile*
Allyssum	*Allyssum parriflorum*
Plains ragweed	*Ambrosia linearis*

Common Name	*Scientific Name*
Pussytoes	*Antennaria rosea*
Parsley sp.	*Apiaceae sp.*
Fendler's Sandwort	*Arenaria fendleri*
Prickly Poppy	*Argemone hispida*
Common Sagewort	*Artemisia campestris*
Wild Tarragon	*Artemisia dracunculus*
Fringed Sage	*Artemisia frigida*
Prairie Sage	*Artemisia ludoviciana*
Milkweed	*Asclepias speciosa*
Dwarf milkweed	*Asclepias uncialis*
Drummond's milkvetch	*Astragalus drummondii*
Platte milkvetch	*Astragalus plattensis*
Shorts Milkvetch	*Astragalus shortianus*
Front Range milkvetch	*Astragalus sparsiflorus*
Bahia	*Bahia dissecta*
Elongated mustard	*Brassica elongata*
Mariposa Lily	*Calochortus venustus*
Musk Thistle	*Carduus nutans*
Mouse ear chickweed	*Cerastium strictum*
Winterfat	*Ceratoides sp.*
Blue Mustard	*Chorispora tenella*
Canada Thistle	*Cirsium arvense*
Redstem springbeauty	*Claytonia rubra*
Golden Smoke	*Corydalis aurea*
Hoary frostweed	*Crocanthemum bicknellii*
Miner's Candle	*Cryptantha virgata*
Hound's Tongue	*Cynoglossum officinale*
Orchard Grass	*Dactylis glomerata*
Purple Praire Clover	*Dalea purpurea*
Geyer Larkspur	*Delphinium geyeri*
Carolina Whitlowgrass	*Draba reptans*
Wild Buckwheat	*Eriogonum effusum*

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Common Name	*Scientific Name*
Sulfur Flower	*Eriogonum umbellatum*
Western Wallflower	*Erysimum asperum*
Rocky Mountain Spurge	*Euphorbia robusta*
Wild Strawberry	*Fragaria virginiana*
Blanket Flower	*Gaillardia pulchella*
Bicknell's cranesbill	*Geranium bicknellii*
Wild Geranium	*Geranium caespitosum*
Gumweed	*Grindelia squarrosa*
Sunflower	*Helianthus spp.*
Hairy Goldenaster	*Heterotheca villosa*
Alumroot	*Heuchera sp.*
Mountain Bladder-pod	*Lesquerella montana*
Sand Lily	*Leucocrinum montanum*
Purple Gayfeather	*Liatris spicata*
Puccoon	*Lithospermum incisum*
Many Flowered Puccoon	*Lithospermum multiflorum*
Lupine	*Lupinus*
White Sweet Clover	*Melilotus alba*
Mountain Bluebell	*Mertensia humilis*
Bluebells	*Mertensia lanceolata*
Bee Balm	*Monarda fistulosa*
Jeweled blazingstar	*Nuttallia speciosa*
Evening Primrose	*Oenothera spp.*
Prairie goldenrod	*Oligoneuron album*
Lambert's Locoweed	*Oxytropis lambertii*
Nailwort	*Paronychia jamesii*
One-sided Penstemon	*Penstemon secundiflorus*
Rocky Mountain phacelia	*Phacelia denticulata*
Scorpion Weed	*Phacelia heterophylla*
Bell's Twinpod	*Physaria bellii*
Rydberg twinpod	*Physaria vitulifera*

Common Name	*Scientific Name*
Rocky Mountain Polypody	*Polypodium saximontanum*
Rocky Mountain cinquefoil	*Potentilla ambigens*
Blue Leaf Cinquefoil	*Potentilla argentea*
Slim Scurfpea	*Psoralidium tenuiflorum*
Prairie Coneflower	*Ratibida columnifera*
Curly Dock	*Rumex crispus*
Russian Thistle	*Salsola iberica*
Bullrush	*Scirpus spp.*
Skull Cap	*Scutellaria brittonii*
Groundsel	*Senecio fendleri*
Jim Hill Mustard	*Sisymbrium altissimum*
Goldenrod	*Solidago multiradiata*
Globemallow	*Sphaeralcea coccinea*
Sand dropseed	*Sporobolus cryptandrus*
Dandelion	*Taraxacon officinale*
Pennycress	*Thlaspi spp.*
Death Camas	*Toxicoscordion venenosum*
Western Spiderwort	*Tradescantia occidentalis*
Salsify	*Tragopogon dubius*
Venus' looking glass	*Triodanus leptocarpa*
Moth Mullein	*Verbascum blattaria*
Mullein	*Verbascum thapsus*
Violet	*Viola nuttallii*
Prairie violet	*Viola pedatifida*
Violet	*Viola purpurea*
Yucca	*Yucca glauca*

III. Appendices

4.3 APPENDIX C

Education Program Inventory and Analysis

A. Existing personal/non-personal interpretation on-site

I. Trailhead Kiosk - Interpretive Panels. 42x38 .08 Aluminum Designed by Jason Silkey. Fabricated by TNT Installed in 2008 Condition: Good

A series of four seasonal interpretive panels are utilized on the trailhead kiosk.

- Winter - Wildlife Adaptations

This sign details some of the adaptations local wildlife have developed in order to sustain themselves throughout the winter. Elk, birds, bobcats and bears are all featured on this sign.

- Spring – Raptors

This sign highlights some local raptor species including Prairie Falcons and Ravens, both of which nested in the area when the sign was developed. It was intended that this sign would assist with the wildlife closure of the Keyhole which used to take place during the spring/early summer

- Summer – Wildflowers

This sign discussed the various sorts of wildflowers and special plants found at the area including Bell's Twinpod. The sign also details pollinators and discusses the features of plants that make them more attractive to one pollinator or another.

- Fall - Geology

This sign gives a brief overview of the geologic history of Devil's Backbone open space, including the formation of the backbone and the erosion and deformation that left behind the rock feature visible today.

II. Geology – Morrison Loop

A series of four signs that detail the geologic history of Devil's Backbone open space spread out on the Morrison Trail. This sign series was intended to serve not only the casual trail user, but also as visual aids for earth science school field trips. All signs are 1/2" Exterior HPL 2 are 18x24, 3 are 36x24 All were designed by Interpretive Graphics Fabricated by Fossil Industries Installed July 2011 Condition: Good

- The Rock Cycle

This sign and associated rock cages detail the rock cycle and discuss the

formation of the three major rock types. Each rock type is illustrated with examples in a gabion style cage.

- Formations of Devil's Backbone

  This sign highlights the four visible rock formations at Devil's Backbone Open Spaces, and shows an example of each in context with one another. The sign shows illustrations of what the landscape may have looked like when the formations were created.

- Backbone Born from the Rockies

  This sign discusses the orogeny of the Rocky Mountains and relates it to the formation of the Devil's Backbone itself.

- Colorado's Fossil Legacy

  This sign discusses the Morrison formation specifically and details the process of fossil formation with an illustration.

- Rounded Rock Puzzle

  This sign describes how rounded metamorphic cobbles of various sizes came to armor the terrace where the sign is located. Flooding and watershed science are discussed along with glacial geology.

III. Mariano Medina

This sign located near the overlook on the Wild Loop Trail highlights the life of Mariano Medina, a historic figure who homesteaded nearby. Medina's life and eccentricities are detailed in this sign. 36x24 HPL Produced by Fossil Industries Designed by Periwinkle Designs Funding from Household Finance Grant Installed in 2008. Condition: Fair

IV. Peak Locator

This sign is located at the overlook on the Wild Loop trail and identifies the visible peaks within the viewshed and their elevations. 60x14 Designed by Periwinkle Designs Fabricated by Fossil Industries Installed in 2008 Replaced multiple times since due to vandalism. Condition: Fair

V. Self Guided Interpretive Brochure

This brochure, available in the trailhead kiosk, has interpretive messages which the visitor can interact with at a series of numbered posts along the Wild Loop trail. Messages in the brochure include Alfred Wild's innovations and entrepreneurialism, the wildlife habitat Devil's Backbone Open Space provides, and the Morrison Formation.

III. Appendices

4.4 APPENDIX D: Colorado Parks and Wildlife Compliance Letter

COLORADO
Parks and Wildlife
Department of Natural Resources

Area 2 - Lon Hagler
4207 W CR 16E
Loveland, CO 80537
P 970.472.4460 | F 970.472-4468

October 13, 2014

Jeffrey Boring
Resource Specialist II
Larimer County
970-619-4569

Re: Devils Backbone Open Space Trail Expansion

Dear Mr. Boring

Thank you for the opportunity to comment on the Devils Backbone Open Space Trail Expansion. The proposal reviewed includes an approximately 1.5 mile extension on the already existing trail system on Devils Backbone Open Space. The new trail will be located approximately .2 miles east of the existing trail system and it runs parallel to the backbone with the purpose of serving as a bypass for congestion on the already existing trail. The proposed trail will be multi use and will accommodate horseback, biking, and walking.

On behalf of Colorado Parks and Wildlife (CPW) I reviewed the material you provided and made a site visit, and we do not anticipate negative impacts for wildlife or habitat due to this project. There were no noticeable nests of protected species, and the site contained minimal amounts of quality food, water, and shelter. The proposed trail does not enter or cross sensitive areas designated on the project map and is therefore unlikely to have a negative impact on them.

CPW feels that the proposed trail will have minimal impacts on wildlife in the area including: deer, elk, coyotes, foxes, raccoon, skunks, and other small mammals. The area has also been known to be visited occasionally by black bear, mountain lion, and bobcat. Raptors and miscellaneous songbird species also frequent the parcel. The proposed trail will not limit movement of wildlife species and is expected to have minimal impact based on line of sight disturbance caused by the existing trail. CPW expects minimal impact on predatory species such as coyotes as the trail should not affect prey base, movement, or dens.

CPW would recommend that additional fencing added to the site or existing fences renovated due to this project should be of a design that is wildlife friendly. On your request we can provide information on Wildlife friendly fencing. It would also be interesting to explore

opportunity to install guzzlers or other devices that may provide water for wildlife on this largely arid upland site.

Again, CPW appreciates the opportunity to review and comment on the proposed trail expansion/alignment at Devils Backbone open space. If there are further questions or concerns that CPW may address as this project moves forward please feel free to contact me at 970-472-4463.

Sincerely,

Clayton Brossart
District Wildlife Manager

CC: S. Yamashita, T. Kroening, M. Taylor, L. Rogstad, C. Brossart

IV. Bibliography

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