

## **Chimney Hollow Open Space Stewardship Plan**



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Larimer County Parks and Open Lands**

## TABLE OF CONTENTS

### Stewardship Plan for the Chimney Hollow Open Space

<b>1. INTRODUCTION.....</b>	<b>1-1</b>
1.1 Purpose and Objectives of the Plan .....	1-1
1.2 History .....	1-1
1.3 Scope and Organization of the Plan.....	1-2
1.4 Public and Agency Involvement.....	1-2
<b>2. EXISTING CONDITIONS .....</b>	<b>2-1</b>
2.1 Overview .....	2-1
2.2 Natural Resources.....	2-1
2.3 Visual Resources .....	2-5
2.4 Cultural Resources.....	2-5
2.5 Socioeconomic Resources .....	2-6
<b>3. OPPORTUNITIES, CONSTRAINTS, AND PLANNING ISSUES.....</b>	<b>3-1</b>
3.1 Overview .....	3-1
3.2 Natural Resource Opportunities, Constraints, and Planning Issues.....	3-1
3.3 Cultural Resource Opportunities, Constraints and Planning Issues .....	3-1
3.4 Education Opportunities, Constraints and Planning Issues .....	3-2
<b>4. STEWARDSHIP PLAN .....</b>	<b>4-1</b>
4.1 Overview .....	4-1
4.2 Natural Resources Management.....	4-1
4.3 Cultural Resource Management .....	4-3
4.4 Environmental Education Opportunities .....	4-4
4.5 Land Acquisitions.....	4-4
4.6 Summary of Implementation Steps and Phasing .....	4-5
<b>5. APPENDIX A: Species Lists .....</b>	<b>5-1</b>
<b>6. APPENDIX B: Chimney Hollow Grazing Assessment.....</b>	<b>6-1</b>
<b>7. BIBLIOGRAPHY .....</b>	<b>7-1</b>

## **1. INTRODUCTION**

### **1.1 Purpose and Objectives of the Plan**

Chimney Hollow Open Space is part of a greater vision for the Blue Mountain Conservation Area as identified in the 2001 Larimer County Open Lands Master Plan to protect natural, visual, cultural, and open space values. Chimney Hollow was acquired in November 2004, with the specific intent to protect the native vegetation, rock outcrops, and wildlife habitat, while providing future outdoor recreational opportunities.

The purpose of this document is to: 1) examine the land stewardship objectives for Chimney Hollow Open Space given the current ecological, social, economic, and political environments; 2) provide the formal program and policy guidelines that will direct the short-term stewardship of Chimney Hollow Open Space until a management plan is developed in the future; and 3) develop specific implementation strategies for carrying out various components of this stewardship plan. The overall objectives of the plan are to:

- Protect, manage, and enhance natural, geologic, cultural, and visual resources including maintaining and promoting healthy ecosystems and their processes;
- Provide educational guided public tours until the property is open to future public access while minimizing detrimental impacts upon resources;
- Define implementation policies, programs and responsibilities for the above goals as well as provide specific implementation steps where appropriate.

A management plan that builds on this stewardship plan will be developed prior to opening this property to the public, and will address non-motorized public access as well as land management activities.

### **1.2 History**

The Ute and Arapahoe were known to inhabit the area including Chimney Hollow until the late 1800's. The Chimney Hollow area was homesteaded from the 1870's through the 1930's. Historical uses of the property include primarily livestock grazing over the past 100 years. Earl Ludlow purchased several of the original 1870's homesteads in the area including the lands in Chimney Hollow. In 1918 Ludlow sold his land to the Edmunds brothers, Don, Chan and Jap whose heirs eventually built the house in the northwest corner (Scot Edmunds). Scot Edmunds & partners formed the Edmunds Land and Cattle Co. which later became the Darlington Land and Cattle Company when it was 1/3 purchased by Darlington. Bill Smith purchased the Edmunds holdings following collapse of the Darlington Land and Cattle Company. Later, Chimney Hollow was consolidated by Jake Welty via shrewd trading and buying. Eventually the

Chimney Hollow property became part of the Lyman G. and Sylvia B. Linger Cattle Ranch in 1946. In 1954 the Linger Ranch won an award from the Denver Post for accomplishments in range conservation (Livermore Woman's Club 2003). After the Lingers passed away the ranch went into an estate before it was purchased by Hewlett-Packard (HP) in 1981.

In the western, central portion of property there are old stone fences along a drainage and an old stone structure likely part of an early homestead. The western access road leads to the Knudson Homestead near the base of Blue Mountain where several dwelling foundations still remain (Todd Schooley, personal communication 2005). Some logging occurred in the west-central part of the property and overgrown old logging roads still lead to most ridges. The Knudson homestead is still evident as remnants of a wood house, corrals and a wood stove at the top of the central meadow and at the base of Blue Mountain. The existing house and ranch structures in the northwest portion of the property were built between 1920 and 1946. County Road 18E and the transmission lines through the north portion of the property were built in the 1940's and as early as 1950 the Bald Mountain Gate House and access road, the Flatiron Penstocks and Carter Lake Pressure Tunnel were built. The Bald Mountain Tunnel and Bald Mountain tower site and access road were constructed in 1954. HP purchased the property in 1981 as a potential employee recreational facility and leased the site through 2002 to an area rancher, Todd Schooley, for cattle grazing. The residence in the northwest portion of the property was leased for occupation during this time.

### **1.3 Scope and Organization of the Plan**

The resource stewardship plan for Chimney Hollow Open Space contains three main sections: 1) a review of existing conditions, including natural, visual, cultural, and socioeconomic resources; 2) a discussion of opportunities, constraints, and planning issues related to the stewardship of the open space; and 3) a management plan addressing the existing conditions, opportunities, constraints, and planning issues and outlining implementation steps and phasing.

### **1.4 Public and Agency Involvement**

The draft stewardship plan will be reviewed by the Open Lands Advisory Board, Parks and Open Lands Staff and a technical advisory group (listed below) comprised of various specialists to ensure resource expertise and diverse user group input.

<b>Name</b>	<b>Affiliation</b>	<b>Expertise</b>
K-Lynn Cameron	Larimer County Parks and Open Lands	Open Lands Manager/ Recreation and Planning
Debbie Eley	City of Loveland Natural Areas Program	Natural Areas Technician
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Charles Gindler	Larimer County Parks and Open Lands	Agricultural Management
Lee Grunau	Colorado Natural Heritage Program	Conservation Planner

Maxine Guill	Larimer County Parks and Open Lands	Weed Management
Ken Jessen	Author and Local Historian	Historian
Merrill Kaufman	USFS	Forest Ecologist
Suzanne Kloster	Colorado Division of Wildlife	District Wildlife Manager
Ann Montoya	Larimer County Parks and Open Lands	Education
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## **2. EXISTING CONDITIONS**

### **2.1 Overview**

Chimney Hollow Open Space, comprising 1,847 acres, is located in the Blue Mountain Conservation Area, approximately 5 miles southwest of the City of Loveland (Map 1). Chimney Hollow Open Space was purchased by Larimer County for its natural, visual, cultural, and outdoor recreational values.

### **2.2 Natural Resources**

#### **a. Climate**

Located along the eastern slope of the Rocky Mountains, this property has a highly variable climate. In general, the climate can be characterized as semi-arid with a strong seasonal variation in temperature, abundant sunshine and relatively low precipitation. The data presented below are averages from August 1948 through December 2003 recorded at the Waterdale Climate Station, (approximately 8 miles north of the property, off the Masonville Road) which is at an elevation of 5,200 ft. (Western Regional Climate Center 2003). While this station is approximately 1000 feet lower than the elevation of the Chimney Hollow Open Space, this is the closest weather station to the property.

The average maximum daily temperature (Fahrenheit) is approximately 80 degrees during May through September and approximately 86 degrees in July and August. Winters are generally cold but are characterized by substantial temperature swings. January is the coldest month with an average daily maximum of 43.2 degrees and an average daily minimum of 13.7 degrees. However, high temperatures in the 50's are not uncommon even in the winter months.

Average annual precipitation is 16.09 inches, with the greatest amount occurring in May. Summer afternoon thunderstorms have the potential to cause erosion problems. Average annual snowfall is approximately 45 inches, but as a result of wind redistribution and topographic patterns, the snow depth can vary throughout the site.

#### **b. Topography/Geology/Soils**

The topography of the Chimney Hollow Open Space is generally characterized as rolling foothills with numerous rocky gulches separating east/west running ridges. Large expanses of open meadows separate ponderosa pine woodlands. Elevations range from 5,800 feet to approximately 7,100 feet at the west boundary.

Soils on the property include the following (USDA-SCS 1980) and are shown on Map 2:

Ratake Rock Outcrop Complex 25-55% slopes: Steep or very steep soils on mountains and ridges. Runoff is rapid and erosion hazard severe.

Trag-Moen Complex 5-30% slopes: Strongly sloping to steep soils on mountains and ridges. Runoff is medium to rapid and erosion hazard is moderate to severe.

Wetmore-Boyle Moen Complex 5-40% slopes: Strongly sloping to steep soils on mountains and ridges. Runoff is rapid and erosion hazard severe.

Wetmore-Boyle Rock Outcrop Complex 5-60% slopes: Strongly sloping to very steep soils on mountains and ridges. Runoff is rapid and erosion hazard severe.

Kirtley Purner Complex 5-20% slopes: Strongly sloping to moderately steep soils on uplands and valley sides. Runoff is rapid and erosion hazard severe.

Kirtley Loam 3-9% slopes: Gently sloping or strongly sloping soil is on uplands and valley sides. Runoff is medium to rapid and erosion hazard severe.

### c. Hydrology

The folding land forms and numerous drainages within Chimney Hollow Open Space drain surface runoff towards the eastern valley (on Northern Colorado Water Conservancy District (NCWCD) land and from there ultimately into Flatiron Reservoir to the north or Dry Creek and ultimately the Little Thompson River to the south. Given the semi-arid climate, these drainages generally carry intermittent flows most common during the spring snowmelt period and after heavy rain events. There are no adjudicated springs, however there are several intermittent springs on the property which feed into the drainages. Stock ponds on the property that were created by damming water behind earthen embankments are scattered north to south but are susceptible to going dry.

### d. Vegetation

Vegetation types present at Chimney Hollow Open Space include a foothills grassland complex (dominated by needle-and-thread grass), mountain mahogany (*Cercocarpus montanus*) shrublands, open ponderosa pine (*Pinus ponderosa*) forest, closed ponderosa pine forest and riparian areas. The property incorporates a diverse landscape with many characteristic features of the Front Range foothills. This heterogeneous landscape supports a mosaic of coniferous forest savannahs, meadows, and rock outcrops. Several small ephemeral streams flow in a predominantly easterly direction. Prior land use practices include some timber harvest (possibly for fence building on the property) and grazing which was ongoing through 2003. Managed primarily as rangeland, in the past this property has been grazed at moderate to high intensity. Vegetation types are shown on Map 3. See Appendix A, Table 3 for a general list of plant species found at Chimney Hollow Open Space.

Foothills Grassland Complex. The foothills grassland complex comprises approximately 50% of the property. Primarily the grasslands are found in the flatter portions of the property and in patches of the rolling foothills. The grassland complex consists of a variety of grass and forb species including needle-and-thread (*Stipa comata*), big bluestem (*Andropogon gerardii*), blue grama (*Bouteloua gracilis*), buffalo grass (*Buchloe dactyloides*), green needlegrass (*Stipa*

*viridula*), pussytoes (*Antennaria rosea*), prickly-pear cactus (*Opuntia macrorhiza*), gayfeather (*Liatris punctata*), buckwheat (*Eriogonum effusum*), Kentucky bluegrass (*Poa pratensis*), fringed sage (*Artemisia frigida*), western wheatgrass (*Agropyron smithii*), and coneflower (*Ratibida columnifera*).

**Mountain Mahogany Shrubland.** Mountain mahogany (*Cercocarpus montanus*) shrublands occur in portions of Chimney Hollow Open Space with moderately steep slopes and shallow soils. While this shrubland community is dominated by mountain mahogany it also includes other shrub species such as three-leaf sumac (*Rhus trilobata*), wax currant (*Ribes cereum*), and rabbitbush (*Crysothamnus nauseosus*). The herbaceous understory consists of various grass and forb species including green needlegrass, western wheatgrass, needle-and-thread, junegrass (*Koeleria macrantha*), bottlebrush squirreltail (*Sitanion longifolium*), purple three-awn (*Aristida purpurea*), broom snakeweed (*Gutierrezia sarothrae*), fringed sage, blue grama, yucca (*Yucca glauca*), prickly-pear cactus, and side-oats grama (*Bouteloua curtipendula*), among others. In portions of the shrubland areas, cheatgrass (*Bromus tectorum*) has become the dominant grass species.

#### **Open Ponderosa Pine Forest**

The open ponderosa pine forests (10-30% canopy cover) in the western portion of the property include a diverse array of native understory species including bluebunch wheatgrass (*Pseudoroegneria spicata*), pine dropseed (*Sporobolus asper*), needle-and-thread grass, green needlegrass, purple three-awn, blue grama, wildrye (*Elymus elymoides*), golden aster (*Heterotheca villosa*), sulphur flower (*Eriogonum umbellatum*), antelope bitterbrush (*Purshia tridentata*), three-leaf sumac, common juniper (*Juniperus communis*), ninebark (*Physocarpus monogynus*), Rocky Mountain juniper (*Juniperus scopulorum*), Douglas fir (*Pseudotsuga menziesii*), mountain mahogany, waxflower (*Jamesia americana*), prickly pear cactus, thickspike wheatgrass (*Elymus macrorurus*), among other grass and forb species.

#### **Closed Ponderosa Pine Woodlands**

The closed ponderosa pine forest is denser with 30% or greater canopy cover, fewer meadows and less understory present.

#### **Riparian Areas**

There are many small riparian drainages throughout the property. Dominant riparian tree and shrub species include wild plum (*Prunus americana*), sandbar willow (*Salix exigua*), plains cottonwood (*Populus deltoides*), chokecherry (*Prunus virginiana*), peachleaf willow (*Salix amygdaloides*), skunkbush, snowberry (*Symphoricarpos oreophilus*), and narrowleaf cottonwood (*Populus angustifolia*). Dominant understory in the riparian areas include Kentucky bluegrass, needle-and-thread, western wheatgrass, sticky geranium (*Geranium caespitosum*), field horsetail (*Equisetum arvense*), poison ivy (*Toxicodendron rydbergii*), native thistle (*Cirsium canescens*), and field mint (*Mentha arvensis*), among others.

#### **Rare or Endangered Species**

The Colorado Natural Heritage Program (CNHP) conducted an inventory of this property both in July 2002 and 2004 (CNHP 2004). This open space is part of the Green Ridge Potential

Conservation Area (ranked B2 – very high biodiversity significance) due primarily to the presence of the globally imperiled ponderosa pine/mountain mahogany/big bluestem (*Pinus ponderosa/Cercocarpus montanus/Andropogon gerardii*) community (ranked G2 S2). This woodland plant association is found only in the Front Range north of Boulder in the transition zone between forests on higher slopes and grasslands in valley bottoms. Unique in this association is the presence of big bluestem, a species that abundantly occurs in the tallgrass prairie of the plains to the east, but is less common in the foothills. There are also locations in the western 1/3 of the property on the lower slopes of Blue Mountain that support the ponderosa pine/spike fescue (*Pinus ponderosa/Leucopoa kingii*) (G3 S3) community. Ponderosa pine/spike fescue woodlands are indicators of late successional forest stands.

Slim-stemmed witchgrass (*Dichanthelium linearifolium*) was also found on a few rock outcrops on the property. This species of grass, though somewhat uncommon in Colorado, is not currently tracked by the Colorado Natural Heritage Program and is ranked as globally secure (G5). However, it is ranked S1 in Wyoming and may warrant consideration for tracking in Colorado as well. Colorado is at the western edge of this species' distribution.

There remains some possibility that the tributaries may contain the rare Ute ladies'-tresses orchid (*Spiranthes diluvialis*), however the drainages were not thoroughly searched in 2002 due to extremely dry conditions, and in 2004 during the CNHP inventory none were observed.

The eastern hillslope on the NCWCD property includes west-facing slopes of a large hogback that runs from Flatiron Mountain south to the Little Thompson River, separating the Chimney Hollow drainage from Carter Lake. These slopes include a fair (C ranked) occurrence of the mountain mahogany/New Mexico feathergrass (*Cercocarpus montanus/Stipa neomexicana*) (G2G3 S2S3) community.

#### Exotic Plants and Noxious Weeds.

Chimney Hollow Open Space has been grazed historically at moderate to heavy levels. Some exotic plants have also become established as a result of historic land uses and introductions from surrounding areas. Known exotics at Chimney Hollow Open Space include dalmatian toadflax (*Linaria gennistifolia* ssp. *dalmatica*), crested wheatgrass (*Agropyron cristatum*), musk thistle (*Carduus nutans*), Canada thistle (*Cirsium arvense*), and three bromes (*Bromus tectorum*, *Bromus japonicus* and *Bromus inermis*). While all of these exotics are actively monitored and controlled by the Open Lands Program, Canada thistle, musk thistle, and dalmatian toadflax are regulated by Larimer County.

#### e. Wildlife

The entire Blue Mountain Conservation Area completes protection of a 9,000-acre east to west wildlife movement corridor. This area provides habitat for a variety of species including big game and non-game species including elk, black bear, coyote, fox, mule deer, voles, mice, turkey, rabbits, bobcat and various reptile and insect species. This property is designated as elk severe winter range and a winter concentration area for elk, mule deer and turkey by the Colorado Division of Wildlife. As many as 300 elk have been seen wintering on the property. Additionally, the property is designated as bald eagle winter range (NDIS 2002). While not on

the open space, two active golden eagle nests are located in the cliffs to the east of the valley and in 2003 and 2004 each successfully fledged at least one chick. A third golden eagle nest is located in the vicinity of the Blue Mountain Bison Ranch. The golden eagles frequent Chimney Hollow Open Space as part of their hunting grounds along the forest edges. Similarly, while not located on the open space, a red-tailed hawk and a raven nest site are each present south of the State Land Board Parcel, and the birds can be seen using the open space on occasion. Prairie falcons (CNHP ranking G5S4), Cooper's hawks and sharp-shinned hawks have also been observed on the open space.

#### *Rare or Endangered Wildlife*

The riparian drainages on-site include suitable habitat for the hops feeding azure butterfly (*Celastrina humulus*) and/or Preble's meadow jumping mouse (*Zapus hudsonianus preblei*). However, the presence of these two species has not been determined.

### **2.3 Visual Resources**

Blue and Bald mountains are significant features of Larimer County's mountain backdrop. Blue Mountain is adjacent to Chimney Hollow Open Space and Bald Mountain is a private inholding. The steep slopes on the western portion of the property form the outslope of Blue Mountain and are moderately timbered and feature interesting rock outcrops that dot the landscape throughout the property. This open space provides protection for the southern Larimer County foothills mountain backdrop and comprises the scenic backdrop to the communities of Fort Collins, Loveland and Berthoud. On clear days both Bald and Blue mountains are visible from I-25. From the top of Bald Mountain one can see as far south as Pikes Peak in Colorado Springs and to the north, Horsetooth Rock.

### **2.4 Cultural Resources**

Chimney Hollow Open Space has a rich cultural history. Incursions by native peoples, homesteading, current day cattle ranching, and residential development all mark a significant cultural history in this area. There are several known cultural features of interest at Chimney Hollow Open Space including the remains of the Knudson Homestead, some rock walls in several drainages, and the standing house and outbuildings along CR 18E (Map 4). The Knudson Homestead and the rock walls have some historic value and tell some of the cultural past of this area. The house along CR 18E is in poor condition and poses more of a liability and cost than a cultural resource.

The property was visited by an archaeologist from Colorado State University in 2003 to determine if there was any significant likelihood of archaeological value. From this visit, there is more likelihood that early peoples would have used the lands along the rimrock cliffs on the adjacent NCWCD lands than at Chimney Hollow Open Space itself.

## **2.5 Socioeconomic Resources**

### **a. Chimney Hollow Open Space Land Status**

The Larimer County Open Lands Program acquired the 1,847-acre Chimney Hollow Open Space for approximately \$3.8 million in November 2004. The land was purchased from HP simultaneous with HP selling the remaining 1,600 acres on the eastern side of the valley to the NCWCD. Larimer County received an open space grant from Great Outdoors Colorado (GOCO) totaling \$950,000 towards the acquisition cost.

#### *Encumbrances*

There are no known mineral or agricultural leases on the property. Known encumbrances include (see Map 5):

- A utility easement consisting of an existing power line to the Western Area Power Authority (WAPA) present on the NCWCD lands and intended to be relocated to the west of where the future reservoir would be built and on Larimer County lands. Larimer County is working with WAPA to ensure that the future powerline location is visually and otherwise discreet if located onto Chimney Hollow Open Space (Map: Powerline Realignment Corridor).
- A crossing easement for the penstock (large aboveground pipe) feeding water into Flatiron Reservoir, as well as access easements to the NCWCD to maintain the penstocks and other related operations.
- Access easements to the top of Bald Mountain and to the Tri-State Generation and Transmission Association inholdings (approx 1-2 acre inholdings each).
- Two parallel transmission lines owned by WAPA (Flatiron/Pole Hill and Estes/Lyons lines) that cross portions of the northern part of the property and follow portions of CR 18E.
- In the Intergovernmental Agreement for the Chimney Hollow Reservoir and Open Space Partnership, various reciprocal accesses with water district have been outlined.

#### *Trails*

Currently there are no established or designated trails.

#### *Roadways*

Existing roadways that access Chimney Hollow Open Space include an access road stemming from CR 18E and traversing through both Bureau of Reclamation and NCWCD lands and extending west to the base of Blue Mountain. The other existing legal access to the property is west of the penstocks from CR 18E to the top of Bald Mountain. There is a driveway into the existing structures in the northwest portion of the open space.

#### *Outbuildings*

There are several structures including a small ranch house, bunkhouse, two corrals, several sheds and an adjudicated well located in the northwestern portion of the property. The main house is heated by means of natural gas and also includes a water well and pump in the basement, a septic system and leach field. In an accidental fire in March 2005, two of the loafing sheds were lost and approximately 8 acres of grassland burned adjacent to CR 18E.

### *Fences*

Existing fencelines on the south, west and north boundaries are in average condition, mostly barbed wire. There is no fencing along the eastern boundary separating the NCWCD and Larimer County lands.

### *Water and Mineral Rights*

**Water rights.** There are no water rights associated with Chimney Hollow Open Space.

**Mineral rights.** Mineral rights are intact.

### *Environmental Assessment*

Based upon a Phase I Environmental Assessment of the property, there are no environmental hazards associated with Chimney Hollow Open Space (Weston Solutions Inc., 2003). However, there is a small dump near to the northwestern residence/ranch buildings that includes old lumber, water heaters, gates, bed springs, a furnace and other miscellaneous debris intended to be removed fall 2005.

### *Agriculture*

The previous landowner predominantly used the lands on Chimney Hollow Open Space for grazing cattle and horses. The Natural Resource Conservation Service (NRCS) conducted a site visit to the entire ranch which totaled 3,447 acres including Chimney Hollow Open Space in April 2002 to determine the range condition and capacity. The completed NRCS report is attached as Appendix D.

#### **b. Adjacent Land Use**

Surrounding lands are a combination of public lands and private property, mainly consisting of large ranches and low to high density rural residential (Map 1).

The Open Lands Program has protected several properties in the Blue Mountain Project Area including the 4,100-acre Blue Mountain Bison Ranch Conservation Easement, the 240-acre Harper Conservation Easement and the 177-acre Ramsay-Shockey Open Space adjacent to Pinewood Reservoir. Larimer County also manages recreational lands surrounding Flatiron, Carter Lake and Pinewood Reservoirs for active recreation. Chimney Hollow Open Space is bordered on the north and southwest by 35-acre subdivisions, to the west by large private ranches and to the east by the NCWCD. To the southeast is State Land Board land that was previously leased by HP for grazing, however that lease expired end of January 2005. Long-term, the District plans to build a water storage reservoir on-site that would be comparable in size to Carter Lake. A high rimrock hogback separates the NCWCD lands from moderate density residential lands above the cliff line and beyond to Carter Lake and surrounding Bureau of Reclamation lands and reservoirs.

#### **c. Access, Circulation and Traffic.**

County Road 18E provides access to Chimney Hollow Open Space. The unpaved access road can be used for maintenance and management purposes by Larimer County and for guided public tour access. Long-term access in partnership with the NCWCD will entail construction of a new road that will connect above the future dam facility and provide the main access to the open

space for maintenance, future public access and emergency access. Two other direct access points to the open space are off of CR 18E and were constructed by the NCWCD as access easements for maintenance of the penstocks.

**d. Public Facilities, Utilities and Services**

Currently, in its undeveloped state, there are no public facilities or utilities available. Fire protection and public safety services are available however.

*Fire protection.* Fire protection is ultimately the responsibility of the Larimer County Sheriff's Department. The open space, however, is also served by the Loveland Rural Fire Protection District.

*Public safety.* Larimer County Parks and Open Lands Rangers are responsible for the education and enforcement of departmental regulations. Rangers assist the Sheriff's Department and other law enforcement agencies in responding to and preventing criminal activity at the open space. Rangers and staff may also be available to provide visitor assistance and emergency and medical needs. The Thompson Valley Ambulance Service responds to more serious medical emergencies, while rescue and searches are conducted by the Larimer County Search and Rescue team of the Sheriff's Department.

**e. Recreational Use and Demand**

With increasing population along the Front Range, the demand for close, convenient recreational opportunities is also increasing. The current (2003) population of Larimer County is approximately 265,679, with 124,767 living in Fort Collins. With existing foothills, regional and local parks and open spaces experiencing heavy use, there is a need for additional trails and open spaces. Similarly, while there are other recreational areas nearby, the focus is on high intense recreation, whereas Chimney Hollow will emphasize less intense, non-motorized recreational use. Chimney Hollow Open Space is a key component of protecting an open space and trail corridor in the foothills.

**f. Operations Budget and Funding**

Chimney Hollow Open Space operations and capital improvement projects will be funded through Help Preserve Open Space sales tax dollars. Based on a long-term management cost study conducted in 2000 by the Larimer County Open Lands Program, start up annual management costs for this area are projected to be \$40,634 (\$22/ac/yr) and after the first 2 years \$20,317 (\$11/ac/yr) prior to development of a trailhead and trail. Once a trail and trailhead are developed and open to the public, annual maintenance costs are projected to be \$401/ac/yr multiplied by the number of acres impacted by public access. Maintenance dollars will cover the cost of rangers and regulation enforcement, weed management, administration, fence repair, trash removal, education, trail maintenance, vegetation restoration, and other management needs.

### **3. OPPORTUNITIES, CONSTRAINTS, AND PLANNING ISSUES**

#### **3.1 Overview**

During development of this stewardship plan, input was received from voluntary and informal Technical Advisory Group, the Open Lands Advisory Board and staff concerning opportunities, constraints, and planning issues in regards to the current existing conditions and short-term stewardship of Chimney Hollow Open Space [In Process]. These issues may be divided into three key components: 1) natural resources, 2) cultural resources, and 3) environmental education.

#### **3.2 Natural Resource Opportunities, Constraints, and Planning Issues**

- *Protect, manage, and enhance natural resources including maintaining and promoting healthy ecosystems and their processes.*

***Natural resource opportunities*** include:

- Protecting Chimney Hollow Open Space from development pressure, which will preserve the integrity of this important landscape.
- Maintaining, restoring and enhancing the natural vegetation communities, including returning disturbed portions of the site to pre-homesteading conditions.
- Enhancing wildlife habitat, which will enable the continued use of the area by wildlife such as raptors, mountain lion, coyote, deer, fox, etc.

***Constraints and planning issues*** associated with the natural resources of the property include the following:

- Noxious weed species have the potential to impair grassland and riparian area health.
- Removing debris from the property is important for safety and aesthetics and these areas should be revegetated with native species to prevent weed growth.
- Grazing management may conflict with future visitor management.
- Grazing management may be costly and require water and fence developments.
- Fire management may be of concern to adjacent landowners.
- Fencing may impact native wildlife if not done appropriately.

#### **3.3 Cultural Resource Opportunities, Constraints and Planning Issues**

- *Protect and enhance the area's cultural resources and history.*

***Cultural Resource opportunities*** include:

- Protection of the historic Knudson Homestead remains for educational purposes and the intrinsic value of the history of this valley.

***Constraints and planning issues*** regarding cultural resource management are:

- The Knudson Homestead is in ruins and further measures to preserve the remains would be costly.
- The house and outbuildings along CR 18E are a safety concern as well as an eyesore.
- Removal of the house and outbuildings along CR 18E may be costly.
- Work with the NCWCD on the relocation of the WAPA powerline to minimize impacts to both visual and cultural resource values.

### **3.4 Education Opportunities, Constraints and Planning Issues**

- *Provide and enhance educational opportunities regarding the area's natural and cultural history and visual resources and the importance of responsible land use and stewardship.*

***Education opportunities*** include:

- Guided public tours onto Chimney Hollow Open Space with staff and volunteer naturalists to allow interim access to this property and an opportunity to learn about existing resources and future management goals.
- Opportunity for assessment of public desires for this open space through information gathering during public tours.

***Constraints and planning issues*** regarding education are:

- Education on the importance of buffer lands for habitat and wildlife refuges may be important to garner public support to protect areas of the property that aren't anticipated to have general public access.
- Incorporating guided trips by staff and/or volunteer naturalists onto this open space will enhance and diversify the educational opportunities available in the Blue Mountain Conservation Area.
- Allowing guided public use may have the potential negative affect of attracting individuals to this open space outside of guided tours. Any unauthorized access by the public may impact adjacent landowners or on-site resources.
- Large groups visiting the site may overwhelm the capacity of the open space and result in resource impacts or reduce the quality of other visitors.
- Public access may increase weed prevalence.

## **4. STEWARDSHIP PLAN**

### **4.1 Overview**

To meet the purpose and objectives of the Chimney Hollow Open Space Stewardship Plan and to address the opportunities, constraints, and planning issues brought forth by the Technical Advisory Team, Open Lands Advisory Board, and staff, the plan is divided into three main components: 1) natural resource management; 2) cultural resource management; and, 3) education opportunities. These three components, while addressed separately, are interrelated and will likely impact and influence each other. A summary of implementation steps and recommended timing is presented.

#### **Overall Vision**

The 2001 Open Lands Master Plan identifies the Blue Mountain Conservation Area as a priority for open space protection for its natural, visual, and open space values. Based on this Master Plan which was developed with extensive citizen planning efforts, the Board of County Commissioners, the Parks and Open Lands Department and the Open Lands Advisory Board agree that Chimney Hollow Open Space fits this goal.

The Larimer County Parks and Open Lands' vision for Chimney Hollow Open Space is to protect the native vegetation, natural rock outcrops, native wildlife, and cultural resources while in the long-term providing outdoor recreational opportunities. Future potential recreational opportunities would be based upon a management plan and are envisioned to include a trailhead and non-motorized access trails. The future Chimney Hollow Reservoir to be built by the Northern Colorado Water Conservancy District, will create additional recreation opportunities which will be managed by Larimer County Parks and Open Lands. Future trail designs will focus on minimizing impacts to sensitive wildlife, riparian areas and rare plant communities and leaving portions of the property undisturbed while enabling visitors to enjoy this magnificent area.

In the near-term, this stewardship plan outlines the vision for natural and cultural resources as well as educational opportunities. Educational programs including guided public tours and future on-site educational activities will allow visitors the opportunity to learn about the native flora and fauna, and cultural history of the area. Additionally, visitors will have the opportunity to learn how to protect this valuable natural resource area and how it fits into the greater context of the Blue Mountain Conservation Area.

### **4.2 Natural Resources Management**

Natural resources management addresses the health and dynamics of the plant and wildlife communities and the preservation of natural and geologic features and scenic vistas of the Chimney Hollow Open Space. For purposes of this plan, natural resources management is

grouped into three categories: a) grassland and shrubland health management; b) wildlife management; and c) forest health management.

**a. Grassland and shrubland health management.**

Vegetation management at Chimney Hollow Open Space will focus on restoration of native species in degraded areas, maintaining native plant communities already in good condition and reducing non-native species. Portions of the property, along roads and in riparian areas have had greater use (traffic, grazing, etc) and become invaded by non-native species over time. The property has been actively grazed historically and feasibility for continuation of grazing practices should be investigated.

The management of non-native plant species is closely intertwined with maintaining native plant health and is addressed in depth in the Integrated Pest Management Plan for the Larimer County Open Lands Program (Larimer County 1999).

*Implementation Steps:*

- Map existing degraded areas within existing vegetation types (grassland, shrubland and forested habitats).
- Inventory non-native vegetation and incorporate Chimney Hollow Open Space into the Larimer County Parks and Open Lands Integrated Pest Management Plan.
- Implement the Pest Management Plan.
- Revegetate degraded areas such as where cattle have trampled and in areas following removal of trash piles with native species.
- Assess the potential for livestock grazing management on the property (particularly appropriate stocking rates, intensity, duration and timing of grazing, potential lessees, water availability, and fencing) or the potential for native grazers to meet grazing management goals due to the high presence of elk and mule deer populations on site.
- Incorporate information on revegetation and weed management efforts as part of educational programs.

**b. Wildlife management.**

Chimney Hollow Open Space supports a variety of wildlife including numerous bird, raptor, and mammal species. Classified by the Colorado Division of Wildlife as elk severe winter range and a winter concentration area for elk, mule deer and turkey, all three of these species can be found on the open space. To help control disease with elk, deer or other wildlife on the property, Larimer County reserves the capability to allow game management through hunting or culling on a limited basis in conjunction with the Division of Wildlife. It is possible that with development of the future reservoir, these large numbers of deer and elk will be displaced in larger abundance on the open space. If this occurs, these large populations of elk and deer browsing and grazing on-site may meet grazing management goals once the reservoir is built.

As the habitat on the property is in good condition currently, minimal improvements to this property are necessary. Forest management activities can incorporate habitat improvements by leaving snags or stack slash for small mammal cover. Annual monitoring of the springs and water in the bermed ponds would be important to ensure water availability for wildlife. Some revegetation and weed management or hard surfacing with rock around these ponds would be beneficial to help prevent weed regrowth.

*Implementation steps:*

- Ensure forest management projects incorporate leaving ponderosa snags as wildlife habitat or piling cuttings for small mammal cover.
- Coordinate with U.S. Fish and Wildlife Service (USFWS) on threatened and endangered species issues. Complete USFWS follow up Preble's meadow jumping mouse trapping or extension requests as needed for any future development activities including trails that would occur within potential Preble's habitat (i.e. primarily riparian areas).
- Maintain an updated presence/absence list of species that use the property, specifically occurrences of sensitive or declining species (both plants and wildlife), to allow for an update in management strategy as new information is found.
- Develop a means to monitor grazing/browsing impacts of elk and deer on the open space to determine if grazing management goals are being met with native browsers alone both pre and post reservoir.

**c. Forest Health Management**

Forest health management will be important for addressing the multi-purpose goals of wildlife habitat improvement, fire hazard reduction, and overall forest health. The closed ponderosa woodland areas on the property show signs of overcrowding – pole trees, reduced ground cover and deformed growth patterns. The open ponderosa woodlands are in better condition overall, however trees are encroaching into the meadow areas and should be assessed for management actions that would keep the open meadows within these savannah areas.

*Implementation steps:*

- Contract with the Colorado State Forest Service or other agency to develop a forest health management plan and implementation phasing.
- Implement the Forest Health Management Plan over a phased period.

**4.3 Cultural Resource Management**

There is a rich cultural history at Chimney Hollow Open Space. Incursions by native peoples, homesteading, current day cattle ranching, and residential development all mark a significant cultural history in this area. There are several known cultural features of interest at Chimney Hollow Open Space including the remains of the Knudson Homestead, some rock walls in several drainages, and the standing house and outbuildings along CR 18E. The Knudson Homestead and the rock walls have some historic value and represent some of the cultural past of

this area. The house along CR 18E is in poor condition and poses more of a liability and cost than resource value.

*Implementation step:*

- Have the property reviewed by the State Historic Preservation Office for any registered historic sites.
- Incorporate cultural history of the site into educational information and/or programs.
- Determine if any historical items of value exist among the remains of the Knudson homestead and determine a use or location for them to be stored.
- Remove all farm dumps and associated debris that have no historical value from the property.
- Remove or demolish the house and outbuildings along CR 18E. Investigate area police/fire departments removing house as a practice site.

#### **4.4 Environmental Education Opportunities**

Educational opportunities at Chimney Hollow Open Space (until future general public access) include staff and volunteer naturalist guided public tours of the site with a focus on education and interpretation of the natural, cultural and open space resources. In partnership with NCWCD and their adjacent land ownership, these tours will also highlight the future reservoir and recreational opportunities.

To minimize concerns related to unauthorized visits resulting from visitors viewing the site via field trips, participants will be educated regarding reasons for the property not currently being open to general public access. Additionally, the property may be used for appropriate research, resource monitoring, and/or as an outdoor laboratory/classroom by the university and local schools.

*Implementation steps:*

- Set up guided public tours to the open space.
- Develop educational materials that would be available for use by volunteer naturalists leading guided public tours and that could be used for future educational information when open to the public.
- Encourage appropriate research, educational studies, long-term monitoring projects and use of the property as an outdoor classroom by the university, local schools or other appropriate groups.

#### **4.5 Land Acquisitions**

Protection of lands adjacent to Chimney Hollow Open Space is desirable in order to buffer the open space from becoming an island surrounded by development. Various tools that may be used in land protection would include fee-simple acquisition, conservation easements, or

working with other agencies such as the State Land Board for placement of those lands in the Conservation Trust Program. Any lands added to the Open Space will be on a willing seller basis and fall under the guidelines of this Resource Stewardship Plan. In addition, acquisition of adjacent lands or trail easements and connections could be important in the future for connecting larger trail systems.

*Implementation steps:*

- Continue to work with adjacent property owners to protect additional lands as appropriate to buffer Chimney Hollow Open Space.
- Continue to discuss with other agencies the possibility for connection of trails in a larger framework of regional trails in this area.

#### **4.6 Summary of Implementation Steps and Phasing**

A tabular summary of implementation steps and proposed timelines are provided below. These steps will be prioritized and implemented in a timely manner.

## Summary of Implementation steps for Chimney Hollow Open Space

Chimney Hollow Open Space Implementation Steps	Cost Estimate	2005	2006	2006 and beyond	Responsible program*
<b>Grassland and shrubland health</b>					
Assess potential for grazing management	Minimal		Spring	Biannual	Open Land Program
Integrate into existing IPM Plan	Staff Person	Summer			Weed Program
Implement IPM Plan				Continual	Weed Program
Revegetate disturbed areas with native seed mix		Fall			Open Lands Program
<b>Wildlife management</b>					
Ensure forest management activities incorporate habitat improvements.					Open Lands Program
Complete any USFWS Preble's requirements.	\$3000 trapping				Open Lands Program
Maintain species list				As Needed	Open Lands Program
<b>Forest Health Management</b>					
Contract with CSFS to complete a forest mgmt plan	\$3500				Open Lands Program
Implement forest management plan				As phased	Open Lands Program
<b>Education opportunities</b>					
Offer guided public tours.	Minimal	Summer/Fall			Open Lands Program
Develop educational materials for tours and future use.	Minimal	Summer/Fall		Continual	Open Lands Program
Encourage appropriate research/educational activities.	Minimal			Continual	Open Lands Program
<b>Cultural resource management</b>					
Have property reviewed by SHPO	Minimal	Summer			Open Lands Program
Incorporate cultural history into educational materials	Volunteer		Summer		Open Lands Program
Determine if any historical items exist at Knudson Homestead	Minimal	Summer			Open Lands Program
Remove all farm dumps and associated debris	\$4000	Summer			Open Lands Program
Remove or demolish house along CR 18E		Winter			Open Lands Program
<b>Land acquisitions</b>					
Explore land acquisition and trail connections	Continual			Continual	Open Lands Program

## 5. APPENDIX A: Species Lists

**Table 1: Common mammal species at the Chimney Hollow Open Space**

Common name	Scientific name
Mule deer	( <i>Odocoileus hemionus</i> )
Mountain lion	( <i>Felis concolor</i> )
Coyote	( <i>Canis latrans</i> )
Elk	( <i>Cervus canadensis</i> )
Least chipmunk	( <i>Eutamias minimus</i> )
Uinta chipmunk	( <i>Eutamias amoenus</i> )
Rock squirrel	( <i>Citellus variegatus</i> )
Golden-mantled squirrel	( <i>Citellus lateralis</i> )
Hispid pocket mouse	( <i>Perognathus hispidus</i> )
Deer mouse	( <i>Peromyscus maniculatus</i> )
Rock mouse	( <i>Peromyscus difficilis</i> )
Mexican woodrat	( <i>Neotoma mexicana</i> )
Prairie vole	( <i>Microtus ochrogaster</i> )
Porcupine	( <i>Erethizon dorsatum</i> )
Red fox	( <i>Vulpes vulpes</i> )
Raccoon	( <i>Procyon lotor</i> )
Striped skunk	( <i>Mephitis mephitis</i> )
Mountain cottontail rabbit	( <i>Sylvilagus nuttalli</i> )

**Table 2: Plant species identified at Chimney Hollow Open Space**

<b>Grasses</b>	
Slim-stemmed Witchgrass	<i>Dichanthelium linearifolium</i>
Needle-and-Thread	<i>Stipa comata</i>
Green Needlegrass	<i>Stipa viridula</i>
Blue Grama	<i>Bouteloua gracilis</i>
Buffalo Grass	<i>Buchloe dactyloides</i>
Little Bluestem	<i>Schizachyrium scoparium</i>
Spike Fescue	<i>Leucopoa kingii</i>
Side-oats Grama	<i>Bouteloua curtipendula</i>
Indian Ricegrass	<i>Oryzopsis hymenoides</i>
Purple Three-awn	<i>Aristida purpurea</i>
Bluebunch Wheatgrass	<i>Pseudoroegneria spicata</i>
Bottlebrush Squirreltail	<i>Sitanion longifolium</i>
Wild Rye	<i>Elymus elymoides</i>
Thickspike Wheatgrass	<i>Elymus macrorurus</i>
Junegrass	<i>Koeleria macrantha</i>
Western Wheatgrass	<i>Agropyron smithii</i>
Kentucky Bluegrass	<i>Poa pratensis</i>
Big Bluestem	<i>Andropogon gerardii</i>
<b>Shrubs</b>	
Mountain Mahogany	<i>Cercocapus montanus</i>
Skunkbush	<i>Rhus trilobata</i>
Hawthorn	<i>Crataegus macrantha</i>
Wax Currant	<i>Ribes cereum</i>
Rabbitbush	<i>Crysothamnus nauseosus</i>
Wild Plum	<i>Prunus americana</i>
Antelope Bitterbrush	<i>Purshia tridentata</i>
Sandbar Willow	<i>Salix exigua</i>
Ninebark	<i>Physocarpus monogynus</i>
Chokecherry	<i>Prunus virginiana</i>
Snowberry	<i>Symporicarpos oreophilus</i>
Broom Snakeweed	<i>Gutierrezia sarothrae</i>
<b>Trees</b>	
Ponderosa Pine	<i>Pinus ponderosa</i>
Peachleaf Willow	<i>Salix amygdaloides</i>
Douglas Fir	<i>Pseudotsuga menziesii</i>
Common Juniper	<i>Juniperus communis</i>
Narrowleaf Cottonwood	<i>Populus angustifolia</i>
Rocky Mountain Juniper	<i>Juniperus scopulorum</i>
Plains Cottonwood	<i>Populus deltoids</i>
<b>Succulents</b>	
Prickly Pear Cactus	<i>Opuntia macrorhiza</i>

Nipple Cactus	<i>Coryphantha missouriensis</i>
Cactus sp.	<i>Opuntia polyacantha</i>
<b>Forbs</b>	
Violet	<i>Viola purpurea</i>
Violet	<i>Viola nuttallii</i>
Salsify	<i>Tragopogon dubius</i>
Fringed Sage	<i>Artemisia frigida</i>
Yucca	<i>Yucca glauca</i>
Gayfeather	<i>Liatrus punctata</i>
Sunflower spp.	<i>Helianthus spp.</i>
Sulphur Flower	<i>Eriogonum umbellatum</i>
Buckwheat	<i>Eriogonum effusum</i>
Coneflower	<i>Ratibida columnifera</i>
Pine Dropseed	<i>Sporobolus asper</i>
Field Horsetail	<i>Equisetum arvense</i>
Thistle	<i>Cirsium canescens</i>
Field Mint	<i>Mentha arvensis</i>
Globemallow	<i>Sphaeralcea coccinea</i>
Prairie Sage	<i>Artemesia ludoviciana</i>
Surfpea	<i>Psoralea tenuiflora</i>
Nailwort	<i>Paronychia jamesii</i>
Drummond Milkvetch	<i>Astragalus drummondii</i>
Sand Lily	<i>Leucocrinum montanum</i>
Wild Blue Flax	<i>Adenolinum lewisii</i>
Wild Onion	<i>Allium textile</i>
Western Wallflower	<i>Erysimum asperum</i>
Wax Flower	<i>Jamesia americana</i>
Blue Mustard	<i>Brassica elongata</i>
Woods Rose	<i>Rosa woodsii</i>
Alyssum	<i>Alyssum parviflorum</i>
False Dandelion	<i>Nothocalais undulata</i>
Golden Smoke	<i>Corydalis aurea</i>
Mouse Ear	<i>Cerastium strictum</i>
Groundsel	<i>Senecio fendleri</i>
Wild Geranium	<i>Geranium caespitosum</i>
Puccoon	<i>Lithospermum incisum</i>
Western Wallflower	<i>Erysimum asperum</i>
Poison Ivy	<i>Toxicodendron rydbergii</i>
Alumroot	<i>Heuchera parviflora</i>
Death Camas	<i>Toxicoscordion venenosum</i>
Prickly Poppy	<i>Argemone sp.</i>
Pussytoes	<i>Antennaria rosea</i>
Yarrow	<i>Achillea lanulosa</i>

<b>Non-natives</b>	
Dalmation Toadflax	<i>Linaria gennistifolia</i> ssp. <i>dalmatica</i>
Musk Thistle	<i>Carduus nutans</i>
Canada Thistle	<i>Cirsium arvense</i>
Mullein	<i>Verbascum thapsus</i>
Dandelion	<i>Taraxacum officinale</i>
Ragweed	<i>Ambrosia trifida</i>
Redstem Filaree	<i>Erodium cicutarium</i>
Gumweed	<i>Grindelia squarrosa</i>
Bindweed	<i>Fallopia convolvulus</i>
Crested Wheatgrass	<i>Agropyron cristatum</i>
Cheatgrass	<i>Bromus tectorum</i>
Smooth Brome	<i>Bromus inermis</i>
Japanese Brome	<i>Bromus japonicus</i>

## **6. APPENDIX B: Chimney Hollow Grazing Assessment**

### **Natural Resources Conservation Service 2002**

This report focused on the entire former HP property and therefore includes both the land now owned by Larimer County and the lands owned by the NCWCD.

It is apparent that there has been a heavy pattern of use running north-south on either side of the main road. There has been less use as one moves upslope to either the west or the east. In the bottom of Chimney Hollow along Dry Creek the willows are grazed but the slopes near the creek bed are stable and vegetated. The impact of grazing on the willows is greater on the north end where they have been grazed harder. The willow community will never be as dense as one would expect to find along a permanent watercourse but there should be an opportunity for young plants to reach maturity. Under the continuous grazing scenario, young shoots are grazed down to nubs. New growth on older plants is also hit hard so the end result is that the shrub community begins a decline. Thereby decreasing food and cover for many other wildlife species.

There are several catchments (dams) on the drainages however, those won't supply much water, if any, during a dry year. The water situation is seasonal at best. Therefore, grazing will always be concentrated near any available source of water and consequently the vegetation will be overgrazed. Once the vegetation is overgrazed and dies out that opens the door for weed invasion. The first road west up the hill leads to a pond that is dry. There are 4 ponds 4 miles SW from the house at the base of Blue Mountain but they too are dry. The ponds along the road in the school section have a little water from runoff but it won't last long. When the draws have water it is usually only in the spring.

Years ago, a portion of the valley near the road was converted to introduced cool season pasture species. The loss of any warm season native species that had historically been found there limits the quality of grazing to only be had in the cool season. Mid-summer warm season grazing isn't as good as it could be due to this conversion.

#### **Current Situation**

Animals usually graze year-round. Currently there are 10 horses and 33 head of cattle on the property. We can look at the 12-month requirements for the animals that have been out there annually for a 4 year period:

<u>Year</u>	<u>Animal Numbers</u>	<u>12 Month Requirements</u>
Now -	10 horses & 33 head of cattle	$125 + 396 = 521$ AUM's
2001 -	15 calves, 30 cows, 2 bulls	$360 + 32 = 392$ AUM's
2000 -	170 cow/calf pairs, 10 bulls	$2040 + 162 = 2202$ AUM's
1999 -	250 cow/calf pairs, 10 bulls	$3000 + 162 = 3162$ AUM's

The actual requirements will be less because animals will be off at some point in time.

### **Estimated Production**

Of the 3,400+ acres, there are about 1,857 grazable acres.

1,123 acres of Loamy Park/Shallow Loam range sites

$$698 \text{ ac} \times 198\#/ \text{ac. useable forage} = 138,204 \#$$

$$425 \text{ ac} \times 228\# = 77,748 \#$$

$$84 \text{ ac} \times 75\# = 6,300 \#$$

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$$222,252 \#$$

568 Acres of Loamy Foothill range site (partially converted)

$$568 \text{ ac} \times 198\# = 112,464 \#$$

166 Acres of Shallow Foothill / Shallow Loam range sites

$$166 \text{ ac} \times 333\# = 55,278 \#$$

### **Total Useable Production**

$$222,252 + 112,464 + 55,278 = 389,994\#$$

$$389,994 \# / 1100 = 354 \text{ AUM's}$$

$$389,994 \# / 900 = 433 \text{ AUM's}$$

Carrying Capacity is estimated to be 354 – 433 AUM's

This would support the equivalent of 30 – 36 cow/calf pairs for 12 months or 70 – 86 for 5 months.

Continuous grazing is a bad situation. Combining it with a lack of stockwater is even worse. The lower portion along either side of the road should be producing upwards of 1000#/acre of useable forage but it is only producing in the range of 200#/ac. Since Dry Creek is normally the most dependable source of water, the livestock has made a habit of grazing that area hard and re-grazing it before the plants have had a chance to recover. There are areas of grass higher up the hillside, however, it is difficult to get the animals to utilize it without salting or developing water in those areas to attract them. Without cross fencing and watering facilities to facilitate proper grazing use your options are limited. Herding the livestock is one way to drive them to areas where you want them to feed and allow them to drift back to water and then repeat the process. This is labor intensive though. In a drought year such as 2002, care must be taken not to stress and overgraze the plants. The way things have been, I would suggest not even thinking of turning out until at least June 1. In addition to this, I would take a hard look at reducing the livestock numbers by as much as 50% of carrying capacity and only having them on the range for a limited amount of time.

By developing water and employing the use of portable electric fencing, you can dictate where the animals graze, the duration of their grazing and insure that grazed plants receive the rest that they require.

### **Water Development**

Dry creek lies in the Quaternary zone that yields small amounts of water to wells. The slopes above this area are part of the Fountain Formation that can yield small to moderate amounts of water. The County well logs show some wells in the adjacent sections:

Sec 18 T4N R70W has a well 265' deep with a water level at 55' producing 3 gpm.

Sec 16 T4N R70W has a well 265' deep producing 15 gpm

Several wells in Sec 31 T5N R70W, average 97' depth, water level at 53' and a production of 1.5 gpm.

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