

Evaluations of Special Areas Cimarron and Comanche National Grasslands Land Management Plan

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Contents

| | |
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| Contents | 1 |
| Introduction | 2 |
| 1. Bent Canyon Bluffs Botanical Area | 3 |
| 1.1. Existing Conditions | 3 |
| 1.2. Desired Conditions | 5 |
| 1.3. Conclusions | 5 |
| 2. The Campo Research Natural Area | 6 |
| 2.1. Existing Conditions | 6 |
| 2.2. Desired Conditions | 7 |
| 2.3. Conclusions | 7 |
| 3. The Comanche Lesser Prairie Chicken Habitat Zoological Area | 7 |
| 3.1. Existing Conditions | 8 |
| 3.2. Desired Conditions | 9 |
| 3.3. Conclusions | 10 |
| 4. Mesa de Maya Botanical Area | 10 |
| 4.1. Existing Conditions | 11 |
| 4.2. Desired Conditions | 12 |
| 4.3. Conclusions | 13 |
| 5. OU Creek Botanical Area | 13 |
| 5.1. Existing Conditions | 13 |
| 5.2. Desired Conditions | 14 |
| 5.3. Conclusions | 15 |
| 6. The Picket Wire Canyonlands Paleontological Area | 15 |
| 6.1. Existing Conditions | 15 |
| 6.2. Desired Conditions | 20 |
| 6.3. Conclusions | 21 |
| 7. Picture Canyon Historical Area | 21 |
| 7.1. Existing Conditions | 22 |
| 7.2. Desired Conditions | 23 |
| 7.3. Conclusions | 23 |
| 8. The Santa Fe National Historic Trail | 23 |
| 8.1. Existing Conditions | 24 |
| 8.2. Desired Conditions | 24 |
| 8.3. Conclusions | 25 |
| 9. Vogel Canyon Historical Area | 25 |
| 9.1. Existing Conditions | 26 |
| 9.2. Desired Conditions | 26 |
| 9.3. Conclusions | 27 |
| References | 29 |

Introduction

This document contains the special areas evaluations that were conducted during the planning process for the Cimarron and Comanche National Grasslands (Grasslands) Land Management Plan (Plan). Nine special areas were identified on the Grasslands. Included in the nine are three currently-designated special areas; the Campo Research Natural Area (RNA), the Comanche Lesser Prairie Chicken Habitat Zoological Area, the Santa Fe National Historic Trail. A summary of the evaluations (the existing conditions and the desired conditions) for each special area is found in Part 1 of the Plan. Objectives and guidelines specific to each special area are included in Part 2 and Part 3 of the Plan.

The 2008 Planning Rule¹ (USDA 2008a) includes special areas as one of the five components of a land management plan. Special areas are places in the National Forest System (NFS) identified or designated because of their unique or special characteristics. Special areas may have different management direction that represents their unique or special characteristics. For example, one of the special areas may have desired conditions that differ from the larger ecosystem surrounding it. Project consistency for a special area would be determined in the same way as is consistency with the other plan components; desired conditions, objectives, guidelines, and suitability of areas. For a discussion on project consistency, see the section in the Grasslands Plan titled “About this Plan.”

The following nine areas on the Grasslands have been identified as special areas because of their unique or special characteristics. The three special areas that are currently designated (one research natural area, one national historic trail, and one zoological area) and the six that would be recommended for designation at plan approval (three botanical areas, two historical areas, one paleontological area) are:

1. Bent Canyon Bluffs Botanical Area
2. The Campo Research Natural Area
3. The Comanche Lesser Prairie Chicken Habitat Zoological Area
4. Mesa de Maya Botanical Area
5. OU Creek Botanical Area
6. The Picket Wire Canyonlands Paleontological Area
7. Picture Canyon Historical Area
8. The Santa Fe National Historic Trail
9. Vogel Canyon Historical Area

In 1999, the Colorado Natural Heritage Program (CNHP) evaluated Bent Canyon Bluffs, Mesa de Maya, and OU Creek as potential RNAs (see CNHP 1999a, 1999b, 1999c). CNHP prepared a series of site-specific reports through a challenge cost-share agreement

¹ The 2008 Planning Rule–36 Code of Federal Regulations (CFR)–was published in the Federal Register (FR) April 21, 2008: National Forest System land management planning, final rule, part 219. Washington, DC: Federal Register 73(77):21505-21512.

with the PSICC. These three areas are identified in the Grasslands Plan as *special areas* because of their unique and special characteristics, but makes no recommendation for their nomination as RNAs.

Following are the evaluations for nine Grasslands special areas.

1. Bent Canyon Bluffs Botanical Area

The Bent Canyon Bluffs Botanical Area is in the Picket Wire Canyon-Rolling Plains ecological subsection (McNab and others 2005), approximately 23 miles southwest of La Junta, Colorado. It is in the arid portion of the Shortgrass Prairie Ecosystem on the Timpas unit of the Comanche National Grassland (Comanche), and occupies all or part of the following:

T. 27S, R. 56W, sections 31–34

T. 27S, R. 57W, sections 33–36

The total acreage identified as a Botanical Area is 4,676 acres.

1.4 % of Shortgrass Prairie Ecosystem

0.85 % of the entire 551,940-acre Plan Area²

0.32 % of the entire 1,444,060-acre Planning Area³

Most of the description below was taken from the CNHP's ecological review of the site (CNHP 1999a). This site would provide a reference area for shortgrass prairie and oneseed juniper woodland management. It also exhibits interesting geological formations which include regular limestone outcrops and large septarian concretions.⁴

1.1. Existing Conditions

Bent Canyon Bluffs Botanical Area is a series of limestone outcrops north of Bent Canyon. It is made up of a series of limestone bluffs that extends for approximately seven miles in a west-to-east direction. These highly dissected bluffs rise approximately 150 feet above the plains. Several intermittent drainages that flow southward from the bluffs leave the plains beneath them heavily divided with drainages and arroyos.

The geology is predominantly Cretaceous age sedimentary deposits. Calcareous shale and limestone of the Niobrara Formation overlie Greenhorn limestone and Carlile and Graneros shales, which overlie Dakota Sandstone and the Purgatoire Formation. These

² "The National Forest System lands covered by a plan." 36 Code of Federal Regulations (CFR) 219.16; Federal Register (FR) p. 21512. (The area within the Grasslands administrative boundary that includes only those lands administered by the Forest Service.)

³ The area within the Grasslands administrative boundary that includes Forest Service-administered lands (the Plan Area) and also private and state-owned and state-managed lands.

⁴ A concretion is a mass or a nodule of mineral matter in sedimentary rock. Septarian pertains to the irregular polygonal pattern of internal cracks developed in septaria (irregular polygonal system of calcite-filled cracks occurring in certain rock concretions).

sedimentary strata are visible throughout the landscape. The bluffs are highly erodible Niobrara Limestone. Dakota sandstone is visible at the toe slopes of the bluffs and in the sandstone breaks area within the terrain beneath the bluffs. Arroyos and intermittent drainages have cut through the finer sediments in the low-lying terrain, exposing the dark gray-black soil derived from Graneros shale. These dark sediments contrast with the white Niobrara limestone benches that extend from the bluffs out onto the plains.

Lace hedgehog cactus (*Echinocereus reichenbachii* var. *perbellus*), a species tracked by CNHP, was observed in great abundance during the CNHP ecological review. Texas horned lizard (*Phrynosoma cornutum*) has been observed at Bent Canyon Bluffs. CNHP has no additional records of threatened, endangered, or state-tracked species in the area.

Along the southern edges of the bluffs, where limestone exposures are most evident, woodlands of oneseed juniper (*Juniperus monosperma*) are common. The herbaceous understory is dominated by New Mexico feathergrass (*Hesperostipa neomexicana*). The composition and density of the understory varies depending on the abundance of limestone. Where limestone rock is not common, a dense New Mexico feathergrass grassland occurs beneath the oneseed juniper with very few associated species. Where the limestone is common, there is a sparse understory of several species, including some calciphiles, like woollycup buckwheat (*Eriogonum lachnogynum*). These woodlands also extend down the slopes of the bluffs and are also found on limestone benches on the plains beneath the bluffs. Low shrublands of Bigelow sagebrush (*Artemisia bigelovii*)/Indian ricegrass (*Achnatherum hymenoides*) are found on the bluffs' limestone soils, particularly at the western end of the area. This shrubland is also found on the limestone outcrops of the terrain beneath the bluffs, often with an unusual shrubland of James' seaheath (*Frankenia jamesii*)/Indian ricegrass. Neither of these shrublands is widely distributed in the area.

Much of the terrain below the bluffs is grasslands. The sideoats grama (*Bouteloua curtipendula*)/little bluestem (*Schyzachrium scoparium*) plant association occurs along the slopes of the bluffs near exposed sandstone and in sandstone break areas along drainages in the plains below. The toe slopes of the bluffs support shortgrass prairie of blue grama (*Bouteloua gracilis*) and James' galleta (*Pleuraphis jamesii*). This grassland plant association is widespread on the plains beneath the bluffs. Occasionally it has a shrub overstory of tree cholla (*Opuntia imbricata*) sometimes mixed with rubber rabbitbrush (*Ericameria nauseosa*).

In other instances, the shrub overstory is either fourwing saltbush (*Atriplex canescens*) or pale desert thorn (*Lycium pallidum*). These shrubs and tree cholla occur where fine sediments have accumulated such as in areas with slight depressions. The blue grama/James' galleta plant association intergrades with small patches of alkali sacaton (*Sporobolus airoides*)/western wheatgrass (*Pascopyrum smithii*) wherever soils become more alkaline such as along drainages and near the southern boundary. Some areas of the plains have undergone surface erosion from water flowing off the bluffs. These eroded areas are covered by annual grasses and forbs, most notably leafy false goldenweed

(*Oenopsis foliosa*). In very isolated settings along the banks are occasional small pockets of plains cottonwood (*Populus deltoides* ssp. *monilifera*) and tamarisk (*Tamarix ramosissima*).

At the far western end is the only disturbed part of the area. A gas pipeline operated by the Colorado Interstate Gas Company runs diagonally across the west end of the area. A two-track road parallels this pipeline across the bluffs and down the slopes onto the plains below. A berm has also been created in this part of the bluffs and some of the neighboring grassland contains nonnative invasive plant species. Two-track roads run along the section line between sections 35 and 36 in the center of the area and along the southern boundary fence at the eastern end of the area. A power line crosses the eastern end of the area in a northeast to southwest direction. A two-track road also runs along a limestone ridge at the far eastern end of the area.

Before the land in the Bent Canyon Bluffs Botanical Area was transferred to the Forest Service, it was part of the Pinon [*sic*] Canyon Maneuver Site managed by the Department of Defense. When the area was managed by the Department of Defense (approximately 1980–1994) it was not grazed by cattle. After being transferred to the Forest Service, the land was incorporated into two allotments that are part of the Timpas Grazing District (USDA FS 1998).

1.2. Desired Conditions

The Bent Canyon Bluffs Botanical Area would continue, as much as possible, the natural composition, structure, and processes of the area's ecosystem. It would continue to support high-quality examples of several plant associations, including oneseed juniper/New Mexico feathergrass, James' seaheath/Indian ricegrass, and Bigelow sage/Indian ricegrass shrublands and woodlands. Unique limestone geological formations and associated plant populations would be maintained. On more level terrain, the area would support examples of productive and vigorous shortgrass prairie plant communities. Populations of nonnative invasive plant species would be controlled or eliminated.

Management of this area and authorized projects and activities would emphasize non-manipulative research, education, observation, and monitoring. The Bent Canyon Bluffs Botanical Area would be a reference area for shortgrass prairie and juniper woodlands and would demonstrate the effects of no livestock grazing in similar type habitats on other areas of the Timpas unit of the Comanche. Populations of nonnative invasive plant species would be non-existent or would occur in very low numbers. Only two-track roads used for administrative purposes (for example, those associated with gas pipelines) would be present.

1.3. Conclusions

The unique or special characteristics of Bent Canyon Bluffs include geological formations of limestone outcrops interspersed with unique septarian concretions, and

high quality plant associations and plant communities. The area demonstrates the qualities that would qualify it for designation as a botanical area.

2. The Campo Research Natural Area

The Campo Research Natural Area (RNA) is in the Sandhill-Ogallala Plateau ecological subdivision (McNab and others 2005), approximately three miles south of Campo, Colorado. **In 1987 this area was designated (established) as an RNA** because it was identified as an undisturbed, representative site of a typical shortgrass plains, grama grass/buffalograss potential natural community. Much of the following information is from the site's establishment record. The Campo RNA is 35 acres in the Shortgrass Prairie Ecosystem on the Carrizo unit of the Comanche, and occupies part of the following:

T. 34S, R. 46W, section 23

The total acreage of this established RNA is 35 acres.

Trace⁵ % of Sandsage Prairie Ecosystem

Trace % of the entire 551,940-acre Plan Area

Trace % of the entire 1,444,060-acre Planning Area

2.1. Existing Conditions

The Campo RNA is on open, wind-swept plains in the arid climate of southeastern Colorado. Eolian sand and silt deposits provide the parent materials for soil development. The sandy soils are prone to wind erosion once vegetation has been disturbed. Surrounding land has been subjected to agricultural practices, and soil from those areas is being deposited on this site. The area is underlain by Cretaceous age rocks.

The vegetation of the area was dominated by buffalograss (*Buchloe dactyloides*) at the time the RNA was established, but, because of recent deposition of sand from surrounding areas, buffalograss is less conspicuous than before. Species composition remains similar to that originally present.

The area has received minor human impacts. It is not in any livestock grazing allotment, and has probably never been plowed. Recent deposits of sand from adjacent areas (sand sagebrush prairie) have changed the character of the site from its initial condition.

The vegetation on the sandy soils is generally a shortgrass prairie of blue grama and buffalograss. Bottlebrush squirreltail (*Elymus elymoides*), purple threeawn (*Aristida purpurea*), and sand dropseed (*Sporobolus cryptandrus*) are also common. Shrubs found here include prickly-pear (*Opuntia polyacantha*) and soapweed yucca (*Yucca glauca*). Common forbs include blanketflower (*Gaillardia* sp.), fringed sagebrush (*Artemisia frigida*), scarlet globemallow (*Sphaeralcea coccinea*), and slimflower scurfpea

⁵ A trace percent of any ecosystem, Plan Area, or Planning Area would be less than 0.01%.

(Psoralidium tenuiflorum).

When comparing the present plant communities to an earlier map of the area, it is apparent that the conditions for which the site was initially established as an RNA have changed.

The CNHP has no records of threatened, endangered or sensitive species in the RNA boundaries.

2.2. Desired Conditions

Natural plant communities would be in good condition. The area would support examples of a good-quality shortgrass prairie community. There would be few nonnative invasive plants in the area, primarily at the edges near existing roads, and evidence of past land use would continue to be limited. Recreation uses for the Campo RNA would include hiking, hunting, or nature study. The Campo RNA would continue to support, within the area's capability, examples of a good-quality shortgrass prairie community for education, monitoring, non-manipulative research, and observation.

The unique characteristics for which this RNA was established would be reviewed and evaluated to assess if it is or can be capable of sustaining the qualities and quantities of the elements that would represent the region's biological diversity.

2.3. Conclusions

The unique or special characteristics of the Campo RNA, for which the area was initially established, have been altered because of recent deposits of sand from adjacent agricultural areas. This has changed the character of the site so that it may no longer exhibit the good-quality habitat that was present in 1987. However, pending review and evaluation, the Campo RNA would continue as a designated (established) RNA.

3. The Comanche Lesser Prairie Chicken Habitat Zoological Area

The Comanche Lesser Prairie Chicken Habitat Zoological Area is in the Sandhill-Ogallala Plateau subsection of the Southern High Plains ecological region (USDA FS 1993), and is east and west of Campo, Colorado. It is in the Sandsage Prairie Ecosystem on the Carrizo unit of the Comanche, and occupies all or part of the following:

T. 34S, R. 44W, sections 22, 23, 24, 25, 26, 27, 34, 35, 36

T. 35S, R. 44W, sections 2, 3, 9, 10, 11, 12, 13, 14, 15, 16

The total acreage of this designated Zoological Area is 10,177 acres.

6.2 % of Sandsage Prairie Ecosystem

1.8 % of the entire 551,940-acre Plan Area

0.7 % of the entire 1,444,060-acre Planning Area

With the approval of the 1984 Pike and San Isabel National Forests, Cimarron and Comanche National Grasslands Land and Resource Management Plan (1984 Plan) (USDA FS 1984), this area was **designated** as the Comanche Lesser Prairie Chicken Habitat Zoological Area, located in management area 10C. In 1987, this area was designated as the Comanche Lesser Prairie Chicken Natural Area by the State of Colorado by Articles of Designation between the Colorado Natural Areas Program and the Forest Service. Historically this area supported one of the highest densities of lesser prairie chickens (*Tympanuchus pallidicinctus*) (species-of-concern) in the State of Colorado, but the species has declined in abundance in this area over the past 15 years. However, the area still provides a contiguous block of appropriate habitat for the birds in Colorado.

3.1. Existing Conditions

The Comanche Lesser Prairie Chicken Habitat Zoological Area has rolling sandsage prairie dissected by ephemeral streams that generally flow south and southeast to the Cimarron River. The landscape is uneven, underlain by extensive areas of Quaternary eolian sand. This area is dominated by sand sagebrush shrublands and perennial bunch grasses. Sand sagebrush/sand dropseed/blue grama is the dominant shrubland cover type occupying much of the area.

The vegetation has been allowed to succeed from abandoned farm land to native sandsage prairie shrubland. The species composition of existing plant communities differs from earlier conditions in several important ways. Key bunchgrass species that are limited in distribution and abundance include big bluestem (*Andropogon gerardii*), indiangrass (*Sorghastrum nutans*), little bluestem (*Schyzachrium scoparium*), prairie sandreed (*Calamovilfa longifolia*), sand lovegrass (*Eragrostis trichodes*), and sand bluestem (*Andropogon halii*). Blue grama has become a dominant grass species in the understory of sand sagebrush in many areas. Some areas that were previously farmed also contain near-monocultures of sideoats grama. Grazing by livestock occurs in all parts of the area. Wildfires have been actively suppressed for the past three decades, and no prescribed burns have been conducted in this area.

Of the few shrub species in the area, sand sagebrush (*Artemisia filifolia*) is the most prominent. Soapweed yucca and scattered tree cholla are also present. Common herbs include

- Engelmann's daisy (*Engelmannia peristenia*)
- Golden prairie clover (*Dalea aurea*)
- Greenleaf five-eyes (*Chamaesaracha coronopus*)
- Hairy false goldeneaster (*Heterotheca villosa*)
- Ragweed (*Ambrosia* spp.)

Vegetation species composition was measured along 30 transects in the area during 1996–1998, and indicated that purple threeawn, sand dropseed (*Sporobolus cryptandrus*)

and buffalograss were the three most abundant grass species, while blue grama and silver bluestem (*Bothriochloa saccharoides*) were present at lower abundance. Taller-structure bunchgrasses, such as sand bluestem and little bluestem, do currently occur in the area, but were too rare to be detected by this level of sampling intensity (30 transects). Measurements of vegetation structure (visual obstruction readings) on 18 transects in the area during 2003–2006 found 5%–12% of the observations were ≥ 12 inches and 22%–35% of observations were 5–11 inches.

There are no known populations of rare plants in the area. Disturbed areas in the sand sagebrush prairie may provide habitat for sandhill goosefoot (*Chenopodium cycloides*), a plant currently on the Regional Forester’s Sensitive Species list⁶ that has been identified as a species-of-concern⁷. Populations of noxious weeds in the area are generally small and scattered. There are some areas with cheatgrass (*Bromus tectorum*), but its populations and extent can vary widely from year to year.

The area is known particularly for its local population of lesser prairie chicken (*Tympanuchus pallidicinctus*). Other birds of the area include:

1. Cassin’s sparrow (*Aimophila cassinii*)
2. Ferruginous hawk (*Buteo regalis*)
3. Horned lark (*Eremophila alpestris*)
4. Swainson’s hawk (*Buteo swainsonii*)
5. Western meadowlark (*Sturnella neglecta*)

3.2. Desired Conditions

Plant communities would be primarily tall-structure vegetation dominated by native bunchgrasses and sand sagebrush. Plant communities where the sagebrush understory is dominated by blue gramma, buffalograss, and purple threeawn would have declined in extent, and would be largely replaced by a sagebrush understory dominated by bunchgrass species including big bluestem, little bluestem, sand bluestem, sand lovegrass, and switchgrass (*Panicum virgatum*). Agricultural fields previously dominated by sideoats grama would be restored to higher levels of plant diversity, including native tall-structure bunchgrasses and sand sagebrush. Overall vertical structure of the vegetation would be increased to levels where 10%–15% of the area has visual obstruction readings ≥ 12 inches, and 25%–50% has visual obstruction readings of 5–11 inches.

Hazards to lesser prairie chickens (such as permanent barbed wire fencing) would be few in number. Trees that could attract lesser prairie chicken predators, other than those trees that provide a nesting site for ferruginous hawks, would not exist in the special area.

⁶ You can view the Region 2 Regional Forester’s Sensitive Species list at: <http://www.fs.fed.us/r2/projects/scp/sensitivespecies/index.shtml> [accessed 03 June 2008].

⁷ See the summary document of the selection process for species-of-concern for a description of species-of-concern and a list of these species for the Grasslands (USDA FS 2008b).

Agricultural fields previously dominated by sideoats grama would be restored to higher levels of plant diversity, including native tall structure bunchgrasses and sand sagebrush. Nonnative invasive plant species would not exist in the special area.

While overall vegetative structure would have increased, the landscape would also include a diversity of areas in different successional stages and with varying vegetative heights. Conditions would include spatial and temporal variability in livestock grazing, ranging from areas that are intensively grazed to areas that are ungrazed for one or more years. Recreation use for lesser prairie chicken viewing would not result in excessive disturbance to the lesser prairie chicken population.

3.3. Conclusions

The unique or special characteristics of the Comanche Lesser Prairie Chicken Habitat Zoological Area, designated as a special area in 1984 (USDA FS 1984), include its contiguous block of habitat for lesser prairie chicken. The area once supported one of the highest densities of lesser prairie chickens in the State of Colorado. As such, the area is designated by Articles of Designation under the Colorado Natural Areas Act⁸ as an established (since 1987) Colorado Natural Area by the Colorado Natural Areas Program in the Department of the Natural Areas Council. Through this separate administrative process,⁹ the Responsible Official identifies this area as a designated Colorado Natural Area, under the terms of the Articles of Designation including the responsibility for habitat management until such time that the agreement is terminated by either the Forest Service or the Colorado Department of Natural Resources.

For these reasons, the area referred to as the Comanche Lesser Prairie Chicken Habitat Zoological Area would retain its special area designation as a zoological area.

4. Mesa de Maya Botanical Area

The Mesa de Maya Botanical Area is in the Tablelands-Red Hills ecological subsection, approximately 15 miles west of Kim, Colorado (McNab and others 2005). It is in the Shortgrass Prairie Ecosystem on the Carrizo unit of the Comanche and occupies all or part of the following:

T. 33S, R. 55W, sections 7, 8, 17, 18

The total acreage identified as a Botanical Area is 518 acres:

0.15% of the Shortgrass Prairie Ecosystem

0.09% of the entire 551,940-acre Plan Area

0.04% of the entire 1,444,060-acre Planning Area

The vegetation composition of the area includes shortgrass prairie grasslands, shrublands,

⁸ C.R.S. 36-10-101 *et seq.*

⁹ FSH 1909.12, sec. 11.15

and piñon (*Pinus edulis*)/juniper woodlands. The Mesa de Maya Botanical Area has interesting geological and botanical resources that are unique from surrounding areas on the Grasslands. Most of the description below is taken from the CNHP, which provided an ecological review of the site as (CNHP 1999b).

4.1. Existing Conditions

The Mesa de Maya Botanical Area is along the northern slopes of Mesa de Maya, a series of eroded basalt-capped mesas extending for 40 miles from southeastern Colorado into northeastern New Mexico and northwestern Oklahoma. The mesa tops are rimmed in basalt, and the slopes beneath the rims are made up of eroding sandstone strewn with rocks from above. Many of the north-facing slopes are covered by old basalt flows. The steep, north-facing slopes are interspersed with benches that are most commonly found at the mid-slope position. Soils at the toe slopes are quite deep and contain small rock debris.

Because of differences in aspect, elevation, and slope, the vegetation of the area is quite varied. The thin soils of the mesa top support mixed prairie grassland. Slopes support shrublands that intergrade with piñon/juniper woodlands. Side canyons support piñon/juniper woodlands with occasional ponderosa pine (*Pinus ponderosa*). Benches support grasslands and juniper woodlands with dense shrub understories. Lower rocky slopes support extensions of woodland and shrubland vegetation, as well as xeric tallgrass prairie.

The area has received human impact. There is one user-created trail up the slopes of the mesa and the thick vegetation makes foot travel challenging. A guzzler for wildlife is located on the lower slopes of the mesa. The mesa tops have been used for livestock grazing.

The CNHP has no records of threatened, endangered, or state-tracked species in the Mesa de Maya area.

The vegetation on the thin soils of the tops of the mesa generally has a mixed-grass prairie of blue grama/western wheatgrass. The grasslands of the mesa tops vary in condition. A small population of cheatgrass is present on the rim of the mesa.

Shrub communities line the rim of the mesa. The shrub communities are unlike any others on the Comanche, dominated by two species of oak brush with several other shrubby species. Most commonly, skunkbush sumac (*Rhus trilobata*)/littleleaf mock orange (*Philadelphus microphyllus*) grows along and just below the basalt. This community intergrades with juniper woodland communities. There is a small pocket of a skunkbush sumac/wax currant (*Ribes cereum*) shrubland community along the basalt at the western end of the area. The slopes of the mesa are a series of woodlands that vary in their species composition. Cool, north-facing slopes support both oneseed and Rocky Mountain juniper (*Juniperus scopulorum*) woodlands. A piñon pine/gray oak (*Quercus*

grisea) community intergrades with Rocky Mountain juniper/mountain mahogany (*Cercocarpus montanus*). Steep mid- to upper slopes more commonly support the Rocky Mountain juniper woodland types, whereas the piñon pine community is more common on the mid- to lower slopes of north-facing slopes. The oaks in the piñon pine/gray oak community grow so thick that they are practically impenetrable. Two oak species, and the hybrid of them, make up this shrub understory: gray oak and Sonoran scrub oak (*Quercus turbinella*). Littleseed ricegrass (*Piptatherum micranthum*) is found in the sparse understory.

The toe slopes are covered with scattered rock debris from above and have accumulated deep soils. These areas support scattered piñon pine/gray oak woodlands and xeric tall grass prairie of big bluestem/little bluestem. New Mexico feathergrass grassland is interspersed between the woodlands and xeric tallgrass prairie.

An adjacent ravine on private property is dominated by ponderosa pine, some of which extends onto the Comanche. The shortgrass prairie on top of the mesa has breeding long-billed curlews (*Numenius americanus*) (species-of-interest)¹⁰.

Livestock grazing has affected some areas which now support nonnative invasive plant species and purple threeawn and broom snakeweed (*Gutierrezia sarothrae*). Stock tanks and two-track roads leading to nearby private property are present on the mesa tops and grasslands beneath the area. A two-track road leads up the north-facing slope of the mesa to a guzzler. In the past, some ponderosa pine individuals have been cut along the rims of the botanical area.

When the present distribution of plant communities is compared to an earlier topographic map of the area, it appears that the woody vegetation, particularly oak thickets, has increased over the mesa slopes.

4.2. Desired Conditions

The existing conditions represent the desired conditions. The area would continue to support good quality examples of shortgrass prairie community types and woodland plant associations. Variations in these community types would continue because of differences in slope, aspect, and elevation. There would be few nonnative invasive plant species in the area. There would be limited evidence of past land use. The plant associations of the mesa slopes would be in good condition, with no unnaturally eroded areas and no conspicuous populations of nonnative invasive plant species. Tallgrass prairie and New Mexico feathergrass grasslands, while very small in size, would continue to be in good condition. Authorized projects or activities in this area would emphasize non-manipulative research, education, observation, and monitoring in the area. Only two-track roads used for administrative purposes would be present.

¹⁰ See the summary document of the selection process for species-of-interest for a description of species-of-interest and a list of these species for the Grasslands (USDA FS 2008b).

4.3. Conclusions

The unique or special characteristics of Mesa de Maya include its unique basalt formations that cap the mesa consisting of substantial cliffs and large talus slopes, and its unique plant species found in the area, where the shrub communities are unlike any others on the Comanche. For these reasons, Mesa de Maya is identified as a botanical area.

5. OU Creek Botanical Area

The OU Creek Botanical Area is in the Picketwire Canyon [sic]-Rolling Plains ecological subsection (McNab and others 2005), approximately seven miles northeast of Kim, Colorado. This area is in the Riparian and Aquatic Ecosystem and the Shortgrass Prairie Ecosystem and occupies all or part of the following:

T. 31S, R. 52, Sections 22, 23, 26, 27, 34, 35

The total acreage identified as a Botanical Area is 3,196 acres:

Trace % of the Riparian and Aquatic Ecosystem

0.95% of Shortgrass Prairie Ecosystem

0.58% of the entire 551,940-acre Plan Area

0.22% of the entire 1,444,060-acre Planning Area

Primary vegetation composition is shortgrass prairie and shrubland. Colorado fraseria (*Frasera coloradoensis*) (species-of-concern) is found in the Botanical Area. Most of the following description is taken from the CNHP's ecological review of the site (CNHP 1999c).

5.1. Existing Conditions

The OU Creek Botanical Area has a series of flat to rolling uplands dissected by OU Creek, an intermittent stream that drains the area. The stream and its tributaries have carved through much of the surrounding plains and have left the landscape uneven and with exposures of the underlying bedrock including Dakota sandstone and Greenhorn limestone. Greenhorn limestone outcrops are also present on eroded uplands. The upland areas are covered by shortgrass prairie grasslands that integrate with shrublands on the lower slopes of the uplands and along the banks of the stream.

Blue grama/buffalograss and blue grama/western wheatgrass plant associations cover much of the uplands in the area. Sand sagebrush/sand dropseed/blue grama is the dominant shrubland cover type; it occupies much of the lower slopes of the uplands and the drainage corridor. Other shrubland plant communities have a minor presence along the banks of the drainage, occurring under localized conditions.

An extensive population of Colorado fraseria, a species-of-concern for the Grasslands, is found in the area (an endemic known only from southeastern Colorado). Wheel milkweed

(*Asclepias uncialis* ssp. *uncialis*), a species-of-concern, is also found here. Ferruginous hawks (a species-of-interest) and loggerhead shrikes (*Lanius ludovicianus*) have been documented breeding in the area.

The vegetation is a series of grassland and shrubland types common to the shortgrass plains. The most common plant associations are blue grama/buffalograss and blue grama/western wheatgrass. These are widespread over most of the upland terrain particularly in areas that are slightly rolling to flat. The lower slopes of the uplands are frequently covered by a shrubland of sand sagebrush and soapweed yucca with an understory dominated by grass species such as blue grama, purple threeawn, needle-and-thread (*Hesperostipa comata*), and sand dropseed. These shrublands become quite thick near the banks of OU Creek. Other widely scattered shrublands also occur along the drainage. A skunkbush sumac/wax currant shrubland occurs where highly eroded banks reveal rocky, sandstone breaks. At the northern end of OU Creek, are small isolated patches of mountain mahogany/needle-and-thread shrublands. Bigelow sagebrush/Indian ricegrass shrublands are also found at this end of the stream on rocky, graduated slopes. This shrubland is on calcareous soils with woollycup buckwheat and New Mexico feathergrass. Soapweed yucca occurs with a dense understory of little bluestem in small, scattered patches along very dry, exposed portions of the drainage.

The effects of the area's long history of livestock grazing are most evident in the stream bottoms, but the uplands also show signs of overuse from previous landowners. Vegetative conditions are improving with better management under Forest Service administration. There are few trees other than some small peachleaf willow (*Salix amygdaloides*) in the middle of OU Creek. A dam constructed at the south end of the stream alters the hydrological regime. Stock tanks are located frequently along the stream reaches. Remnants of an old homestead with stone fences and planted locust trees are at the northern end of the area, along with old two-track roads and wire fences.

5.2. Desired Conditions

The OU Creek Botanical Area would continue to support examples of good quality shortgrass prairie community types and its unique shrubland communities, including the skunkbush sumac/wax currant, mountain mahogany/needle-and-thread, and Bigelow sagebrush/Indian ricegrass associations. The area harbors a type of bedrock that would continue to support a well-distributed and self-sustaining population of Colorado fraseria. Unique geological features with potential paleontological resources would be protected from surface disturbances.

Authorized projects and activities in this special area would emphasize education, monitoring, non-manipulative research, and observation. Livestock grazing would continue to be authorized in combination with prescribed fire to provide the periodic disturbance and moderate vegetative cover desired in areas with known populations of Colorado fraseria. Populations of nonnative invasive plant species would be controlled or eliminated.

5.3. Conclusions

The unique or special characteristics of the OU Creek include its unique botanical and geological resources, and the high-quality ecosystems that could be a model for comparison to management on other parts of the Comanche. In particular, the special area supports a large population of Colorado fraseria, an endemic species known only from southeastern Colorado. OU Creek exhibits qualities that identify it as a botanical area.

6. The Picket Wire Canyonlands Paleontological Area

The Picket Wire Canyonlands (the Canyonlands) is a portion of the Purgatoire River Valley, its tributaries, and side canyons, beginning approximately 20 miles south of La Junta and extending discontinuously for about 24 miles along the Purgatoire River. The Canyonlands are in the Picketwire [sic] Canyon-Rolling Plains ecological subsection (McNab and others 2005) in the Riparian and Aquatic, and Canyonland Ecosystems on the Timpas unit of the Comanche. The Canyonlands occupies all or part of the following:

- T. 27S, R. 55W, sections 20, 26–29, 32–35
- T. 28S, R. 55W, sections 3, 4, 5, 7–9, 17–19, 29, 30–32
- T. 29S, R. 55W, sections 5 and 6
- T. 28S, R. 56W, sections 13, 23–26, 34–36
- T. 29S, R. 57W, sections 2–5, 7–10, and 18
- T. 30S, R. 57W, sections 9, 17–21, 30

The total acreage identified as a Paleontological Area is 16,728 acres.

- 37% of Canyonland Ecosystem
- 6% of Riparian and Aquatic Ecosystem
- 3% of the entire 551,940-acre Plan Area
- 1% of the entire 1,444,060-acre Planning Area

Public Law 101-510, sec. 2825 mandates that Picket Wire Canyonlands be managed “to conserve and protect the paleontological, archaeological, wildlife, vegetative, aquatic, and other natural resources of the area.”

The predominant vegetation composition in the Canyonlands includes oneseed juniper woodland, shrubland, and grassland (CNHP 1999d and 1999e). Before 1983, the Canyonlands had been used for livestock grazing; currently there is no grazing in the area. Only those with a Forest Service-issued permit are allowed to be in the Canyonlands between dusk and dawn; public motorized access is also prohibited without a permit (Closure Order #91-10) (USDA FS 1991). Daytime, non-motorized public access into the northern and largest unit is at Withers Canyon Trailhead. There is no ready public access to the southern and smallest unit.

6.1. Existing Conditions

Abundant and diverse paleontological resources in the Canyonlands include trace, plant,

invertebrate, and vertebrate fossils from the Permian through the Cretaceous geologic periods. A structural geologic monocline (Black Hills) trends through the center of the Canyonlands, pushing up late Paleozoic and early Mesozoic rock layers that are regionally exposed only in this small area.

The premier attribute of the Canyonlands is a large assemblage of dinosaur trackways exposed in the Jurassic Morrison Formation (150 million years old). Hundreds of recreationists visit the site annually by a publicly accessible hiking trail or Forest Service conducted auto tours. Over 1,300 prints, which are naturally exposed along the banks of the Purgatoire River for roughly one-half mile, represent about 100 individual dinosaur trackways. The tracks include those of at least four distinct kinds of dinosaurs, including sauropods, small and large theropods, and ornithopods. This site is internationally recognized as one of the most significant assemblages of dinosaur tracks, and continues to be the subject of ongoing studies. The Purgatoire River, which unearthed the site, is beginning to erode portions of the tracksite away along the edge of the stream. Erosion control structures (rock vanes) have significantly slowed this process. Simultaneously, the river's action is exposing new areas of the track-bearing limestone layer.

The Canyonlands also holds many occurrences of dinosaur bones, eroding from the same Jurassic layers (Morrison Formation). Less than half of the Canyonlands holdings have been surveyed for paleontological resources, but thirty-five individual occurrences of dinosaur bones have been recorded. Three of these sites have been excavated, including a dinosaur bone quarry (the Last Chance site), which is being excavated in partnership with the Denver Museum of Nature and Science, and includes the remains of minimally four dinosaur skeletons, including sixty percent of a large and well-preserved skeleton of *Apatosaurus* (Schumacher 2008). This and other quarries have also revealed partial skeletons of the dinosaurs *Allosaurus* and *Camarasaurus*.

The Cretaceous Dakota Sandstone, a resistant, cliff-forming unit that rims the canyon area, holds an abundance of plant fossils and dinosaur tracks in many areas (Schumacher 2003). These dinosaur tracks are not related to those of the main Purgatoire trackway (they are over 50 million years younger and represent a different ecosystem). Dinosaurs represented include iguanodontids and ornithomimids, and recently (February 2008) an abundance of such tracks were discovered occurring in the Dakota Sandstone along Minnie Canyon.

Other paleontological resources in the Canyonlands are concentrated in the Cretaceous Glencairn Shale (a diverse marine invertebrate community of bivalves and ammonites) and Entrada Sandstone (plant fossils and isolated stream deposits containing a rare assemblage of Middle Jurassic vertebrates) (Schumacher 2004).

6.1.a. Heritage and historic resources

The Canyonlands has many important, well-preserved pre-historic and historic archaeological sites, many of which are eligible to the National Register of Historic

Places (NRHP). The Rourke Ranch Historic District in the Canyonlands was listed on the NRHP in 2000.

The uniqueness of the Canyonlands owes largely also to its prehistoric sites, which have remained almost completely undisturbed. The excellent preservation and high density of Late Prehistoric (A.D. 100–1450) sites—with features such as domestic architecture, rock art, and middens with tens of thousands of discarded tools and food refuse items—make this an rich area for research on the cultural, geographical, and temporal relationships of a long-term Late Prehistoric community in southeastern Colorado. Important proto-historic rock art resources and sites reflecting the Biographic rock art traditions (for example, scratched horses and pictographs) are also present and well preserved. These date to the Proto-Historic to Early Historic periods, ca. A.D. 1450 to 1525 to 1846 (Mitchell 2002).

The Canyonlands is a distinctive context for studying the early Hispanic and Anglo-American settlement of southern Colorado. The period from initial Hispanic and Anglo-American settlement in the 1860s to the end of a viable Hispanic community in the early 1900s (Late Historic A.D. 1846–1955) is documented in Canyonlands sites. These sites represent activities such as cattle ranching, community development, religious practices, sheep ranches, and subsistence farming. Except for the destruction of some sites by the 1904 Purgatoire River flood, most historic sites appear to have remained undisturbed.

The Canyonlands' significant Late Prehistoric and Late historic occupations make it eligible to the NRHP as an Archaeological District and also a Historic District. Other NRHP-eligible sites date to other prehistoric, protohistoric and historic periods. The Canyonlands receives a high volume of recreational use because of its unique historical, natural, paleontological, rock art, and scenic resources. Interpretation of historic and natural resources is provided. While a high percentage of heritage resources in the area are in good to excellent condition, some sites are being affected or are threatened by neglect, public visitation, unmanaged recreation, vandalism, and by natural processes, such as alluvial and eolian erosion, wildlife, and wildland fires.¹¹

More than 80% of the Canyonlands has been inventoried for heritage resources. Over 500 archaeological sites have been documented; these span approximately the past 11,500 years. Approximately 54% of these are considered significant and eligible to the NRHP, 22% are recommended as not eligible, and 24% will require archaeological testing to determine the presence of important archeological deposits. The Rourke Ranch Historic District is listed on the NRHP.

¹¹ Wind erodes the earth's surface by deflation (removing loose, fine-grained particles by the turbulent action of the wind) and by abrasion (wearing down surfaces by grinding action and sand blasting of windborne particles).

6.1.b. Botanical, wildlife, and other resources¹²

The Canyonlands extends over a broad elevational gradient that is unusual on the plains; it represents a broad range of natural variation within a diversity of ecosystem types. Because of the differences in aspect, elevation, and slope, the vegetation of the area is quite varied. Slopes support shrublands that intergrade with juniper woodlands. Side canyons support piñon-juniper woodland. Benches support grasslands and juniper woodlands.

Much of the exposed bedrock that makes up the Canyonlands above the Purgatoire River is steep and is only sparsely vegetated. The uppermost part of the canyon is steep slopes harboring juniper woodlands; the graminoid understory changes depending on aspect, elevation, and slope. Mountain mahogany and skunkbush sumac shrublands are plentiful on the lower slopes. Blue grama/James' galleta grasslands, often with an overstory of tree cholla, is found on gravelly benches overlooking the river, at the base of mesa slopes and on canyon floors.

The area has high-quality examples of woodland plant associations in the oneseed juniper series. Oneseed juniper/blue grama, oneseed juniper/black grama, and oneseed juniper/mountain mahogany plant associations are widespread throughout the Canyonlands. Oneseed juniper woodlands occupy most of the slopes. There are shrublands on canyon bottoms, in narrow side canyons, and integrate with woodlands on upper slopes. Grasslands cover much of the flat to rolling terrain of canyon bottoms, benches, and plateaus above the Purgatoire River Canyon.

Before 1982, there was livestock grazing throughout the canyon; this is evidenced by numerous rock walls and corrals. Hydrological modifications like berms, canals and stock tanks are also present. Nonnative invasive plant species have also affected parts of this special area. Most of the area, however, is in excellent condition.

The CNHP has several records of rare plants and animals in the area. Populations of longhood milkweed (*Asclepias macrotis*), are known at several locations. Others are listed in Table 6-1. Recently there have been rediscoveries of a giant centipede (*Scolopendra heros*); several species of spider have been discovered that had not previously recorded by the State of Colorado.

¹² Most of the botanical information was taken from the CNHP, which provided an ecological review for Bravo Canyon and Rourke Canyon as potential RNAs (CNHP 1999d and 1999e).

Table 6-1. CNHP list of rare plants and animals in Picket Wire Canyonlands

| Rare plants | Rare animals |
|---|--|
| Dwarf wild indigo (<i>Amorpha nana</i>) | Gray vireo (<i>Vireo vicinior</i>) |
| Eaton's lip fern (<i>Cheilanthes eatonii</i>) | Hepatic tanager (<i>Piranga flava</i>) |
| Purple cliffbrake (<i>Pellaea atropurpurea</i>) | Rufous-crowned sparrow (<i>Aimophila ruficeps</i>) |
| Wooton's lip fern (<i>Cheilanthes wootonii</i>) | Scott's oriole (<i>Icterus parisorum</i>) |
| Wright's cliff-beak (<i>Pellaea wrightiana</i>) | |

Oneseed juniper woodlands extend over many of the mesa slopes and canyonlands in the area. The graminoid understory changes in composition depending on slope, aspect, and elevation. The oneseed juniper/black grama and oneseed juniper/blue grama plant associations are the most common; together they create a mosaic on the mesa slopes along the entire length of the area. Oneseed juniper/mountain mahogany and oneseed juniper/New Mexico feathergrass plant associations occur in small pockets under localized conditions. Scattered piñon pine was observed in these community types but was not dominant.

Shrubland communities intergrade with woodlands over much of the mesa slopes from the upper to toe slope position, and line narrow side canyons and drainages. The mountain mahogany/sideoats grama plant association often lines the graduated lower slopes of wide canyon mouths. The skunkbush sumac/littleleaf mock orange plant association occurs on dry, exposed slopes and extends from just below the mesa rims to the lower slopes. The skunkbush sumac/wax currant plant association fills narrow side drainages and canyons. A veil of riverbank grape (*Vitis riparia*), western white clematis (*Clematis ligusticifolia*), and Virginia creeper (*Parthenocissus quinquefolia*) often covers these shrub species, along with common elderberry (*Sambucus nigra*). Knobs of eroded sedimentary strata on the terraces overlooking the Purgatoire River support sparse juniper woodlands with dense shrub understories of mountain mahogany. The graminoid layer varies in composition. Some of these knobs have exposed gypsiferous to calciferous soils that support shrublands of spiny greasebush (*Glossopetalon spinescens*)/James' seaheath. This plant association is extremely localized in the area, occurring only with exposures of these soil types.

Much of the flat to rolling terrain of the wide-mouthed canyons and terraces above the Purgatoire River support shortgrass prairie grassland of blue grama and James' galleta. Tree cholla/blue grama, a variation of this grassland association, occurs where fine soils accumulate, such as in slight depressions. Canyon bottoms that have been disturbed support a shrubland of rubber rabbitbrush/tree cholla with an understory of James' galleta and blue grama. This herbaceous layer is often made up of a high number of exotic

species and native increasers. Small patches of black grama/hairy grama (*Bouteloua hirsuta*) grassland are found on very dry south-facing, rocky upper mesa slopes. This grassland is a minor vegetation type of the area.

Canyon bottoms are vegetated with a blue grama/James' galletta grassland that often has a shrub overstory of tree cholla and rubber rabbitbrush. Mesa slopes are generally oneseed juniper woodlands with a graminoid layer that changes depending on slope position and elevation. Widely scattered shrublands of skunkbush sumac and common hoptree (*Ptelea trifoliata*) intergrade with these woodlands. They are most prevalent below the mesa rims and on arid slopes. Small pockets of mountain mahogany are found under localized conditions. West-facing slopes generally have widely-spaced woody vegetation; east facing slopes have dense woody vegetation. Mesa tops have open oneseed juniper woodlands with occasional piñon pine and a graminoid understory of New Mexico feathergrass. This community type is most evident along the mesa rims. In some areas, New Mexico feathergrass forms dense grassland with a few other grass species and no overstory. In the centers of the mesas are depressions that collect finer sediment that supports blue grama/James' galletta grasslands with an overstory of tree cholla. In some sites along the mesa top, are small patches of needle-and-thread-blue grama. Side canyons and intermittent drainages are dense with shrubs that include common hoptree, skunkbush sumac, tasselflower brickellbush (*Brickellia grandiflora*), mountain mahogany, and trumpet gooseberry (*Ribes leptanthum*).

6.2. Desired Conditions

6.2.a. Paleontological and heritage resources

Paleontological resources would continue to be explored, recorded, and preserved in partnership with outside institutions. Volunteer projects would continue to provide the bulk of survey and labor efforts. When the total Canyonlands area has been surveyed for paleontological resources, a cyclical system of survey and salvage would be instituted. The cumulative results of surveys would be made publicly available through popular literature, interpretive signage, and peer-reviewed publications.

Heritage resources would continue to be protected and preserved through a variety of mechanisms, not limited to official site registration. Deferred maintenance of priority heritage assets would be reduced and these sites stabilized. Sites that cannot be stabilized would be mitigated. The NRHP eligibility status would be determined for all identified cultural resources, a condition that would probably take longer than the 15-year planning period. Consultations with tribal governments about the management of cultural resources in the Canyonlands would take place on a regular basis.

Research that improves the knowledge, understanding, and appreciation of prehistoric and historic sites and geoarchaeology of the Canyonlands would be encouraged. Public appreciation, enjoyment, and understanding of these heritage resources would continue to be promoted, and interpretative signage highlighting the Canyonlands' unique resources

would be provided. Public access to the area would be controlled and the effects of visitor use would be monitored to help preserve natural and heritage resources. Uses of the special area would be managed so that the physical integrity and cultural, natural, and scenic resources are not diminished.

6.2.b. Botanical, wildlife, and other resources

The Picket Wire Canyonlands Paleontological Area would continue to support the existing diversity of plant associations that results from its wide range of elevations, slopes, and aspects. Many of the plant associations covering sizeable acreages, particularly in the oneseed juniper woodland cover type, would be in very good to excellent quality. Also, the sheer size of the special area would continue to allow for a wide representation of environmental variation, landscape patterns, and plant associations.

Plant communities on mesa slopes, side canyons, and terraces would continue to receive minimal human impacts. Areas disturbed by previous farming would support a diversity and abundance of native shrubs and grasses. Tamarisk populations along the Purgatoire River would have been controlled and replaced by native grasses, shrubs, and trees. Ongoing management of nonnative invasive plant would prevent effects on native plant communities. Tamarisk control and vegetation restoration projects would also provide for habitat needs of a diversity of wildlife species.

The Forest Service would meet annually and work collaboratively with the Department of Defense (DOD) and the Colorado Division of Wildlife (CDOW) to develop and achieve habitat and population goals for a self-sustaining elk population in the Canyonlands. Tamarisk control and vegetation restoration projects would also provide for habitat needs of scaled quail (*Callipepla squamata*), wild turkey (*Meleagris gallopavo*), deer (*Odocoileus* sp.), and bighorn sheep (*Ovis canadensis*).

The Forest Service would meet annually and work collaboratively with the DOD (Pinon [sic] Canyon Maneuver Site) to ensure administrative access into the Picket Wire Canyonlands Paleontological Area.

6.3. Conclusions

The unique or special characteristics of the Picket Wire Canyonlands include its aquatic, heritage, paleontological, vegetative, wildlife, and other natural resources. Picket Wire Canyonlands exhibits the qualities that identify it as a paleontological area.

7. Picture Canyon Historical Area

Picture Canyon Historical Area is unique for its heritage resources and the recreation opportunities these provide. Currently this area has restricted motor vehicle use under PSICC Order #08-12 (USDA FS 2008c) because of environmental, seasonal, or management considerations. The Picture Canyon Historical Area is eligible to be

nominated to the NRHP as a historic district. Picture Canyon Historical Area is in the Canyonland Ecosystem and the Riparian and Aquatic Ecosystem on the Carrizo unit of the Comanche and occupies all or part of the following:

- T. 35S, R. 47 W, section 7, S½; S½ N½; NE¼ NW¼
- T. 35S, R. 47W, section 18, N½ N½

The total acreage identified as a Historical Area is 752 acres.

- 1.8% of the Canyonland Ecosystem
- trace% of the Riparian and Aquatic Ecosystem
- 0.14% of the entire 551,940-acre Plan Area
- 0.05% of the entire 1,444,060-acre Planning Area

7.1. Existing Conditions

The Picture Canyon Historical Area includes a moderately deep, entrenched tributary of the Cimarron River. On the valley floor are two large permanent springs; there are intermittent seeps and small springs along the base of the Mesa Rica Formation that forms the canyon wall. Elevation in the canyon is approximately 4,300 feet above mean sea level.

Picture Canyon Historical Area has many heritage resources that probably date between A.D. 100 and 1920. Site types include food processing areas, habitation shelters, historic inscriptions, homesteads, lithic scatters, and rock art. Some rock art images represent the Late Prehistoric Plains Representational and Abstract tradition and probably date to the late Developmental or early Diversification periods, ca. A.D. 950 to 1150. Most, however, represent Plains Ceremonial (for example, V-necked warrior, shields, parallel and intersecting grooves) and Biographic traditions (for example, scratched horse and pictographs). The Ceremonial and Biographic rock art traditions date to the Proto-Historic to Early Historic periods, ca. A.D. 1450 to 1525 to 1846 (Mitchell 2002).

The prairie above the rim of Picture Canyon is dominated by little bluestem and blue grama. Other plants in the prairie include broom snakeweed, hairy false goldeneaster, soapweed yucca, and twistspine pricklypear (*Opuntia macrorhiza*).

The riparian area below the cliffs has

1. Cuman ragweed (*Ambrosia psilostachya*)
2. Indiangrass
3. Narrowleaf willow (*Salix exigua*)
4. Netleaf hackberry (*Celtis laevigata* var. *reticulata*)
5. Sand bluestem

Many rock outcrops are void of vegetation but protected sites and some cliff tops have oneseed juniper. Also in protected areas of the cliffs are locally unusual ferns: Eaton's lipfern (*Cheilanthes eatonii*), ebony spleenwort (*Asplenium platyneuron*), and purple cliffbrake.

Picture Canyon Historical Area receives a high volume of recreational use and has been heavily vandalized. There is no archaeological conservator to mitigate and de-emphasize the visual impact of heavily vandalized rock art panels. Little interpretation of the historic and natural resources is found in Picture Canyon Historical Area. Vandalism continues to be a problem in the canyon. Unmanaged recreation, grazing, and natural weathering processes are also eroding some archaeological deposits.

7.2. Desired Conditions

The Picture Canyon Historical Area would continue to support its historical, recreational, and scenic opportunities. Uses of the special area would not diminish its physical integrity and cultural, natural, and scenic resources. Heritage resources would be protected from the adverse effects of grazing and unmanaged recreation. Heritage resources would be stabilized when and if erosion occurs. Scenic values and qualities of the area would continue. Research that improves the knowledge and understanding of heritage sites would be encouraged. Public appreciation, enjoyment, and understanding of these resources would be promoted and interpretive signage that highlights the unique cultural and natural resources would be provided. Uses of the special area would be managed so that the physical integrity and cultural, natural, and scenic resources are not diminished.

7.3. Conclusions

The unique or special characteristics of Picture Canyon include its scenic, historical, and recreational opportunities. The area identified as Picture Canyon has the qualities that identify it as a historical area.

8. The Santa Fe National Historic Trail

The Santa Fe Trail played an essential role in the westward expansion of the U.S. and in trade relations with Mexico between 1821 and 1880. The Trail was designated a National Historic Trail by Congress in 1987, under the authority of the National Trails System Act, Public Law 100-35.

Two routes, two branches, and one stage road of the Santa Fe National Historic Trail cross portions of the Grasslands:

1. Aubrey Cutoff Branch (1850–1860)
2. Barlow-Sanderson Wagon Road Branch (also known as the Vogel Canyon Branch) (1855–1870)
3. Cimarron Route branch (1821–1880)
4. Granada to Fort Union Wagon Road Branch (1872–1874)
5. Mountain Route Branch (1821–1880)

On November 23, 1993, the Colorado State Historic Preservation Officer listed the

Barlow-Sanderson Wagon Road Branch (historic property number 5OT452) as officially eligible for inclusion in the NRHP. Combined, the length of these branches and their segments is approximately 68.5 miles and encompasses approximately 8,170 acres.

The National Park Service is the designated administrating agency for the Santa Fe National Historic Trail. To help ensure that the trail is appropriately marked, protected, interpreted, and developed, the NPS coordinates and monitors the efforts of many governmental and non-governmental landowners. This evaluation is drawn from and is consistent with the Santa Fe National Historic Trail Comprehensive Management and Use Plan (USDI NPS 1990) and the Memorandum of Understanding between the NPS and the PSICC signed March 6, 1991 (USDA FS and USDI NPS 1991).

8.1. Existing Conditions

The Cimarron has 29 miles of the Cimarron Route Branch of Santa Fe National Historic Trail and its segments. The Cimarron Branch itself is 24 miles long (1,325 acres), the longest Trail segment on public land. Middle Springs and Point of Rocks are important historical sites along the trail and are eligible for inclusion in the NRHP. Both sites have recreation opportunities and interpretative signage.

On the Comanche, the Mountain Branch, Aubrey Branch, Granada to Fort Union Wagon Road Branch, and the Barlow-Sanderson Wagon Road Branch segments total approximately 39.5 miles (6,845 acres). Santa Fe Trail interpretive signage and recreational opportunities are provided at Barlow-Sanderson interpretive signage (near Vogel Canyon), Timpas Picnic Area, Sierra Vista Overlook, and Iron Springs.

The Santa Fe Trail itself is a fragile resource, extremely vulnerable to erosion and human and animal impacts. The condition and surface visibility of Trail ruts vary across the Grasslands from well preserved and easily visible to poorly preserved with no surface visibility. Ruts that are not visible on the surface may be buried below the modern ground surface. Archaeological testing of Trail segments with no surface ruts may be necessary to determine if subsurface ruts are present. To date, this sort of testing has been conducted only in the narrow rights-of-way of oil and gas pipeline projects that cross the Trail (for example, south of Tobe, Colorado).

8.2. Desired Conditions

The identified segments of the Santa Fe National Historic Trail would continue to perpetuate the inherent physical integrity and cultural, natural, and scenic resources of the Trail, consistent with the Santa Fe National Historic Trail Comprehensive Management and Use Plan (USDI NPS 1990) and the Memorandum of Understanding between the NPS and the PSICC signed March 6, 1991 (USDA FS & USDI NPS 1991). The Forest Service would continue to cooperate with the Santa Fe National Historic Trail Advisory Council on matters relating to trail administration.

Visible and subsurface rut segments and associated sites would be protected in their current condition. Visible ruts would be stabilized when and if erosion directly affects those ruts. Archaeological testing of Trail segments that show no surface ruts would determine the presence of subsurface ruts. Recreational facilities and interpretative signage would provide high-quality recreational opportunities and would not diminish the Trail's physical integrity, scenic values, or cultural and natural resources. Scenic values and qualities of the designated historic route would be maintained or improved. Research that improves the knowledge, understanding, and appreciation of trail remnants and related resources, and the overall commemoration of its national significance, would continue to be encouraged. Outdoor recreation, public enjoyment, appreciation and understanding of the Trail and related sites and side trails would be promoted. Uses of the Trail and related sites would be managed so that physical integrity and cultural, natural and scenic resources of the Trail are not diminished.

8.3. Conclusions

The unique or special characteristics of the Grasslands' branches of the Santa Fe National Historic Trail include the trail-related cultural and natural resources found along the trail route, in addition to its educational, historic, recreational and scenic opportunities. The Santa Fe National Historic Trail has the qualities that identify it as a special area.

9. Vogel Canyon Historical Area

Vogel Canyon Historical Area is unique for its heritage resources and the recreation opportunities these provide. The Vogel Canyon Historic District was listed on Colorado's State Historic Register in 1995. It is in the arid portion of the Shortgrass Prairie Ecosystem and the Canyonland Ecosystem on the Timpas unit of the Comanche, and occupies all or part of the following:

- T26S, R.55W, section 24, S $\frac{1}{2}$ S $\frac{1}{2}$; NE $\frac{1}{4}$ SE $\frac{1}{4}$; SE $\frac{1}{4}$ NE $\frac{1}{4}$
- T26S, R.54W, section 19, W $\frac{1}{2}$ SW $\frac{1}{4}$; SW $\frac{1}{4}$, NW $\frac{1}{4}$
- T26S, R.54W, section 30, NW $\frac{1}{4}$ NW $\frac{1}{4}$

The total acreage identified as a Historical Area is 416 acres.

- 0.97% of Canyonland Ecosystem
- Trace % of Shortgrass Prairie Ecosystem
- 0.08% of the entire 551,940-acre Plan Area
- 0.03% of the entire 1,444,060-acre Planning Area

Currently motor vehicle use in this area is restricted under PSICC Order #08-12 because of environmental, management, or seasonal considerations (USDA FS 2008b).

9.1. Existing Conditions

Vogel Canyon Historical Area includes a tributary to the Purgatoire River. Rock cliffs are primarily Dakota sandstone weathered to a light color with some heavily patinated¹³ rock faces. Water is scarce, but generally available from several natural springs at cliff bases. Elevations range between 4,300 to 4,400 feet above mean sea level. Vogel Canyon has many heritage resources that date probably between 500 B.C. to A.D. 1920. Prehistoric site types found in the canyons include food processing areas, habitation shelters, lithic scatters, and rock art. Many rock art panels may date from as early as 500 B.C. to as late as A.D. 1600; this is based on relational information to Great Basin, Rio Grande, Plains Biographic, and the Pecked Representational rock art styles. The rock glyphs suggest that the shelters were used intensively during the Late Archaic and Ceramic Periods, 100 B.C. to A.D. 1500 (Kane and others, 1995). Historic sites include the Vogel Canyon Wagon Road Branch (associated with the Santa Fe National Historic Trail), a stage station, earlier sheep ranching, and early homesteading during the Depression Era.

The area above the canyon rim of Vogel Canyon Historical Area is in shortgrass prairie dominated by blue grama. Near the rim of the canyon, shortgrass prairie intermingles with oneseed juniper woodlands. Common herbs in these plant communities include Dakota mock vervain (*Glandularia bipinnatifida*), horsetail milkweed (*Asclepias subverticillata*), and rusty lupine (*Lupinus pusillus*). Skunkbush sumac and golden currant (*Ribes aureum*) are scattered in rocky areas at the rim of the canyon. Much of the area below the canyon walls is dominated by cheatgrass, although the riparian strip has stands of native grasses including switchgrass and vine mesquite (*Panicum obtusum*). Tamarisk is scattered in the riparian areas near the springs.

Vogel Canyon Historical Area receives a high volume of recreational use and has been heavily vandalized. During the 1990s, the Forest Service contracted an archeological conservator to mitigate and de-emphasize the visual impact of the heavily vandalized rock art panels. Public interpretation and educational materials have been developed and installed in Vogel Canyon. Vandalism continues to be a problem, although it appeared to decrease slightly in Vogel Canyon after the conservation and interpretative project was completed. Unmanaged recreation, grazing, and natural weathering processes are also eroding some archaeological deposits.

9.2. Desired Conditions

The Vogel Canyon Historical Area would continue to support its important and fragile heritage resources and the high-quality recreation and education opportunities these provide. Uses of the area would not diminish physical integrity and cultural, natural, and scenic resources. Heritage resources would be preserved and protected from vandalism, unauthorized recreation, vehicle uses, and livestock grazing. Heritage resources would be

¹³ Covered by a coat of patina. Patination is the chemical process by which a patina is formed.

stabilized if and when erosion occurs. Scenic values and qualities of the area would continue to be exhibited. Research that improves the knowledge and understanding of heritage sites would continue to be encouraged. Outdoor recreation, and the public enjoyment, appreciation, and understanding of these heritage resources would be promoted and interpretative signage highlighting the area's unique cultural and natural resources would be provided. Uses of the area would be managed so that physical integrity and cultural, natural, and scenic resources would not be diminished.

9.3. Conclusions

The unique or special characteristics of Vogel Canyon include its important educational, heritage, historical, scenic resources, and recreation opportunities. Vogel Canyon exhibits the qualities that would qualify it for designation as a historical area.

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