

United States Department of Agriculture Natural Resources Conservation Service

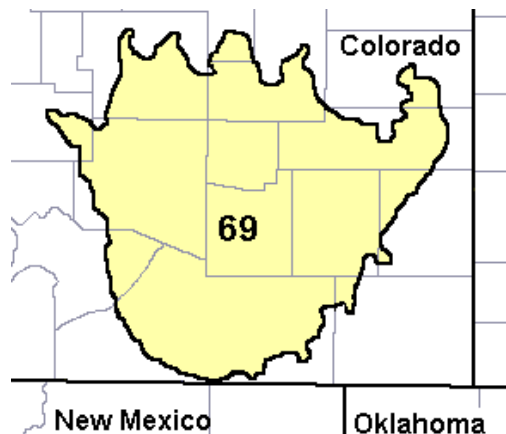
Ecological Site Description

Site Type: Rangeland

Site Name: Limestone Breaks

Site ID: R069XY058CO

Major Land Resource Area: 69 – Upper Arkansas Valley
Rolling Plains



Physiographic Features

This site occurs on nearly level plains to very steep hills. Topography can be rough, broken with numerous ridges and knobs dissected by narrow, intermittent streams.

Landform: plain, hill, ridge, scarp, mesa, cuesta

Aspect: N/A

	<u>Minimum</u>	<u>Maximum</u>
Elevation (feet):	3600	6000
Slope (percent):	1	60
Water Table Depth (inches):	60	60
Flooding:		
Frequency:	none	none
Duration:	none	none
Ponding:		
Depth (inches):	0	0
Frequency:	none	none
Duration:	none	none
Runoff Class:	high	very high

Climatic Features

The mean average annual precipitation varies from 10 to 14 inches per year depending on location and ranges from 5 inches to over 24 inches per year. Approximately 75 percent of the annual precipitation occurs during the growing season from mid-April to late-September. Snowfall can vary greatly from year to year and can range from 20 to 40 inches per year. Winds are estimated to average about 6 to 7 miles per hour annually. Daytime winds are generally stronger than nighttime and occasional strong storms may bring brief periods of high winds with gusts to more than 60 miles per hour.

The average length of the growing season is 155 days, but varies from 147 to 162 days. The average date of first frost in the fall is October 10, and the last frost in the spring is about May 5. July is the hottest month and January is the coldest. It is not uncommon for the temperature to exceed 100 degrees F during the summer. Summer humidity is low and evaporation is high. The winters are characterized with frequent northerly winds, producing severe cold with temperatures dropping to as low as -35 degrees F.

Growth of native cool season plants begins about April 15 and continues to about June 1. Native warm season plants begin growth about May 1 and continue to about August 15. Regrowth of cool season plants occurs in September and October of most years, depending on moisture.

	<u>Minimum</u>	<u>Maximum</u>
Frost-free period (days):	147	162
Freeze-free period (days):	169	186
Mean Annual Precipitation (inches):	10	14

Average Monthly Precipitation (inches) and Temperature (°F):

	Precip. Min.	Precip. Max	Temp. Min.	Temp. Max.
January	0.28	0.27	12.1	46.4
February	0.14	0.36	15.3	52.9
March	0.25	0.68	20.7	61.5
April	0.73	1.16	28.9	71.8
May	0.90	2.21	38.6	81.1
June	0.83	1.79	47.6	91.4
July	2.34	2.38	53.4	96.2
August	1.62	2.00	51.7	93.7
September	1.04	1.12	43.3	86.0
October	0.90	0.78	32.2	74.2
November	0.49	0.51	21.0	58.1
December	0.43	0.27	14.1	48.6

Climate Stations		Period	
Station ID	Location or Name	From	To
CO6763	Pueblo Army Depot	1971	2000
CO3828	Haswell	1922	2001
CO7287	Rush	1924	2001
CO4834	Las Animas	1930	2001

For detailed information visit the Western Regional Climate Center at <http://www.wrcc.dri.edu/> website.

Influencing Water Features

Wetland Description:	<u>System</u>	<u>Subsystem</u>	<u>Class</u>	<u>Sub-class</u>
None	None	None	None	None

Stream Type: None

Representative Soil Features

The soils of this site are very shallow and shallow. Permeability is moderate. Typically these soils formed in slope alluvium and residuum from limestone. They occur on hills, ridges, scarps, cuestas, mesas, and plains. The available water capacity is typically very low or low. The surface layer ranges from 2 to 7 inches thick and is typically loam or channery loam. Rock fragment content ranges from 0 to 35 percent. Limestone occurs at depths of 6 to 20 inches. The pH of these soils generally ranges from moderately alkaline to strongly alkaline. The soil moisture regime is ustic aridic but ranges to aridic in the driest areas of MLRA 69. The soil temperature regime is mesic.

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Exposed areas of limestone and bare ground are inherent to this site. Where slopes are gentle, water flow paths should be broken, irregular in appearance or discontinuous with numerous debris dams or vegetative barriers and exhibit slight to no evidence of rills, wind scoured areas or pedestaled plants.

As slopes become steep and bare areas increase, expect to find evidence of water flow patterns and pedestaled plants. Sub-surface soil layers, where not affected by bedrock, are non-restrictive to water movement and root penetration.

Major soil series correlated to this ecological site include: Penrose

Soil series that will be correlated to other MLRA's when outdated soil surveys are updated are: none

Other soil series that have been correlated to this site include: Minnequa

Parent Material Kind: slope alluvium, residuum

Parent Material Origin: limestone

Surface Texture: loam

Surface Texture Modifier: channery

Subsurface Texture Group: loam, clay loam

Surface Fragments $\leq 3''$ (% Cover): 0 to 35 percent

Surface Fragments $> 3''$ (%Cover): 0 to 15 percent

Subsurface Fragments $\leq 3''$ (% Volume): 0 to 35 percent

Subsurface Fragments $> 3''$ (% Volume): 0 to 15 percent

Rock fragments are generally gravel or channers.

	<u>Minimum</u>	<u>Maximum</u>
Drainage Class:	well	well
Permeability Class:	moderate	moderately slow
Depth (inches):	6	20
Electrical Conductivity (mmhos/cm)*:	0	4
Sodium Absorption Ratio*:	0	10
Soil Reaction (1:1 Water)*:	7.9	9.0
Soil Reaction (0.1M CaCl₂)*:	7.6	9.0
Available Water Capacity (inches)*:	0.4	4
Calcium Carbonate Equivalent (percent)*:	40	75

*These attributes represent 0-40 inches in depth or to the first restrictive layer.

Plant Communities

Ecological Dynamics of the Site:

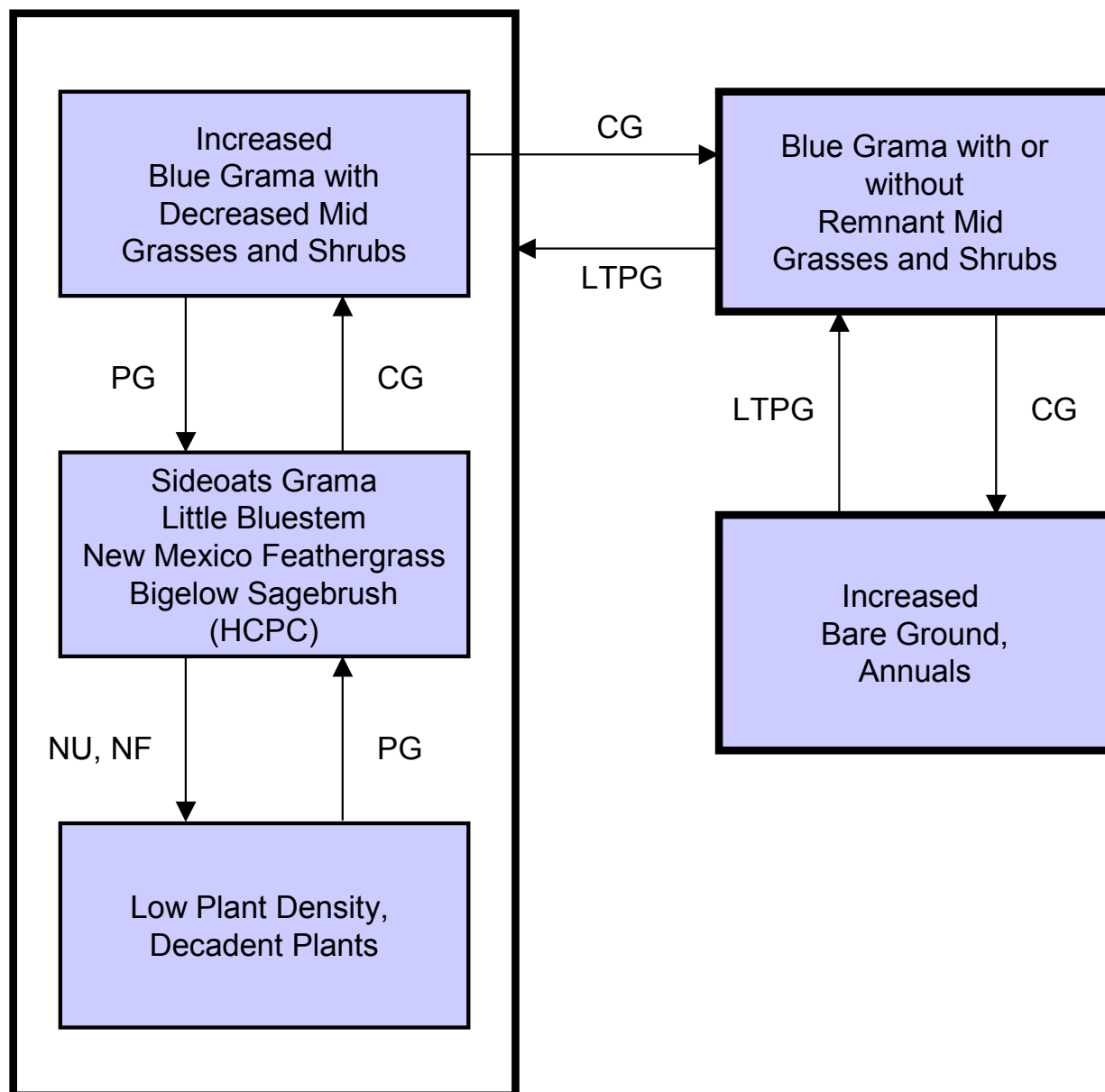
Continuous grazing without allowing for adequate recovery opportunities between grazing events causes this site to deteriorate. Grasses such as little bluestem, sideoats grama, big bluestem, switchgrass, yellow Indiangrass, New Mexico feathergrass, western wheatgrass and needleandthread decrease in both frequency and production. Blue grama, hairy grama and galleta will increase. Forbs and shrubs such as purple prairie clover, American vetch, winterfat and fourwing saltbush will decrease. Mid and tall grasses can eventually be removed from the plant community. Over the long-term, continuous use will result in large amounts of bare ground. Species such as red threeawn, sand dropseed, mat loco, sessile nailwort, small soapweed, broom snakeweed and annuals will increase or invade the site.

Drier and warmer climatic conditions exist in the central portion of MLRA-69. This area includes the eastern half of Pueblo county, northern Otero, extreme northwestern Bent, western edge of Kiowa, southern edge of Lincoln and all of Crowley County. These conditions are primarily caused by a rain shadow effect from the southern Rocky Mountains. Evapotranspiration rates (atmospheric demand) will be higher in this area of MLRA-69. Total annual production will typically be lower.

The historic climax plant community (description follows the plant community diagram) has been determined by study of rangeland relic areas, areas protected from excessive disturbance, seasonal use pastures, short duration/time controlled grazing and historical accounts.

The following is a diagram that illustrates the common plant communities that can occur on the site and the transition pathways (arrows) among communities. Bold lines surrounding each plant community or communities represent ecological thresholds. The ecological processes will be discussed in more detail in the plant community descriptions following the diagram.

Plant Communities and Transitional Pathways



CG - continuous grazing without adequate recovery opportunity, **HCPC** - Historic Climax Plant Community, **LTPG** - long-term prescribed grazing (>40 years), **NF, NU** - no fire, non-use, **PG** - prescribed grazing with adequate recovery opportunity

Plant Community Composition and Group Annual Production

			Sideoats Grama, Little Bluestem, New Mexico Feathergrass, Shrubs (HCPC)		
COMMON/GROUP NAME	SCIENTIFIC NAME	SYMBOL	Group	lbs./acre	% Comp
GRASSES & GRASS-LIKES			1	420 - 480	70 - 80
sideoats grama	Bouteloua curtipendula	BOCU	1	120 - 150	20 - 25
little bluestem	Schizachyrium scoparium	SCSC	1	90 - 120	15 - 20
New Mexico feathergrass	Hesperostipa neomexicana	HENE5	1	90 - 120	15 - 20
blue grama	Bouteloua gracilis	BOGR2	1	60 - 90	10 - 15
galleta	Pleuraphis jamesii	PLJA	1	18 - 42	3 - 7
western wheatgrass	Pascopyrum smithii	PASM	1	6 - 30	1 - 5
needleandthread	Hesperostipa comata ssp. comata	HECOC8	1	6 - 18	1 - 3
green needlegrass	Nassella viridula	NAVI4	1	6 - 18	1 - 3
hairy grama	Bouteloua hirsuta	BOHI2	1	6 - 18	1 - 3
Indian ricegrass	Achnatherum hymenoides	ACHY	1	6 - 18	1 - 3
big bluestem	Andropogon gerardii	ANGE	1	0 - 18	0 - 3
Indiangrass	Sorghastrum nutans	SONU2	1	0 - 18	0 - 3
switchgrass	Panicum virgatum	PAVI2	1	0 - 18	0 - 3
plains muhly	Muhlenbergia cuspidata	MUCU3	1	6 - 12	1 - 2
black grama	Bouteloua eriopoda	BOER4	1	0 - 6	0 - 1
hairy tridens	Erioneuron pilosum	ERPI5	1	0 - 6	0 - 1
pinyon ricegrass	Piptochaetium fimbriatum	PIFI	1	0 - 6	0 - 1
prairie junegrass	Koeleria macrantha	KOMA	1	0 - 6	0 - 1
prairie sandreed	Calamovilfa longifolia	CALO	1	0 - 6	0 - 1
ring muhly	Muhlenbergia torreyi	MUTO2	1	0 - 6	0 - 1
rough tridens	Tridens muticus var. elongatus	TRMUE	1	0 - 6	0 - 1
sand dropseed	Sporobolus cryptandrus	SPCR	1	0 - 6	0 - 1
sun sedge	Carex inops ssp. heliophila	CAINH2	1	6 - 18	1 - 3
threadleaf sedge	Carex filifolia	CAFI	1	0 - 6	0 - 1
other perennial grasses		2GP	1	6 - 18	1 - 3
FORBS			2	60 - 90	10 - 15
American vetch	Vicia americana	VIAM	2	6 - 12	1 - 2
dotted gayfeather	Liatris punctata	LIPU	2	6 - 12	1 - 2
purple prairie clover	Dalea purpurea	DAPU5	2	6 - 12	1 - 2
cutleaf evening-primrose	Oenothera coronopifolia	OECO2	2	0 - 6	0 - 1
desert Indian paintbrush	Castilleja applegatei	CAAP4	2	0 - 6	0 - 1
desert princesplume	Stanleya pinnata var. pinnata	STPIP	2	0 - 6	0 - 1
Fremont goldenweed	Oonopsis foliosa var. foliosa	OOFOF	2	0 - 6	0 - 1
hairy goldaster	Heterotheca villosa	HEVI4	2	0 - 6	0 - 1
Hood's phlox	Phlox hoodii	PHHO	2	0 - 6	0 - 1
James' cryptantha	Cryptantha cinerea var. jamesii	CRCIJ	2	0 - 6	0 - 1
Louisiana sagewort	Artemisia ludoviciana	ARLU	2	0 - 6	0 - 1
mat loco	Astragalus kentrophyta	ASKE	2	0 - 6	0 - 1
narrowleaf penstemon	Penstemon angustifolius	PEAN4	2	0 - 6	0 - 1
plains blackfoot daisy	Melampodium leucanthum	MELE2	2	0 - 6	0 - 1
prairie coneflower	Ratibida columnifera	RACO3	2	0 - 6	0 - 1
Rocky Mountain zinnia	Zinnia grandiflora	ZIGR	2	0 - 6	0 - 1
scarlet globemallow	Sphaeralcea coccinea	SPCO	2	0 - 6	0 - 1
silky crazyweed	Oxytropis sericea	OXSE	2	0 - 6	0 - 1
slimflower scurfs	Psoralea tenuiflorum	PSTE5	2	0 - 6	0 - 1
sulphur-flower buckwheat	Eriogonum umbellatum	ERUM	2	0 - 6	0 - 1
tenpetal blazingstar	Mentzelia decapetala	MEDE2	2	0 - 6	0 - 1
western ragweed	Ambrosia psilostachya	AMPS	2	0 - 6	0 - 1
woolly locoweed	Astragalus mollissimus	ASMO7	2	0 - 6	0 - 1
wormwood	Artemisia dracunculus	ARDR4	2	0 - 6	0 - 1
other perennial forbs		2FP	2	6 - 18	1 - 3
SHRUBS			3	60 - 90	10 - 15
Bigelow sage	Artemisia bigelovii	ARBI3	3	18 - 42	3 - 7
fourwing saltbush	Atriplex canescens	ATCA2	3	6 - 18	1 - 3
James' frankenia	Frankenia jamesii	FRJA	3	6 - 18	1 - 3
winterfat	Krascheninnikovia lanata	KRLA2	3	6 - 18	1 - 3
plains greasewood	Glossopetalon planitium	GLPL	3	0 - 12	0 - 2
skunkbush sumac	Rhus trilobata	RHTR	3	0 - 12	0 - 2
true mountainmahogany	Cercocarpus montanus	CEMO2	3	0 - 12	0 - 2
wax currant	Ribes cereum	RICE	3	0 - 12	0 - 2
fringed sagebrush	Artemisia frigida	ARFR4	3	0 - 6	0 - 1
golden currant	Ribes aureum	RIAU	3	0 - 6	0 - 1
green plume rabbitbrush	Ericameria nauseosa ssp. nauseosa var. glabrata	ERNAG	3	0 - 6	0 - 1
walking stick cholla	Opuntia imbricata	OPIM	3	0 - 6	0 - 1
other shrubs		2SHRUB	3	6 - 18	1 - 3
TREES			4	0 - 6	0 - 1
oneseed juniper	Juniperus monosperma	JUMO	4	0 - 6	0 - 1
pinyon pine	Pinus edulis	PIED	4	0 - 6	0 - 1
Annual Production lbs./acre				LOW	RV* HIGH
GRASSES & GRASS-LIKES				240 -	447 - 700
FORBS				55 -	75 - 95
SHRUBS				55 -	75 - 95
TREES				0 -	3 - 10
TOTAL				350 -	600 - 900

This list of plants and their relative proportions are based on near normal years. Fluctuations in species composition and relative production may change from year to year dependent upon precipitation or other climatic factors. *RV = Representative value.

Plant Community Narratives

Following are the narratives for each of the described plant communities. These plant communities may not represent every possibility, but they probably are the most prevalent and repeatable plant communities. The plant composition table shown above has been developed from the best available knowledge at the time of this revision. As more data is collected, some of these plant communities may be revised or removed, and new ones may be added. None of these plant communities should necessarily be thought of as “Desired Plant Communities”. According to the USDA NRCS National Range and Pasture Handbook, Desired Plant Communities will be determined by the decision-makers and will meet minimum quality criteria established by the NRCS. The main purpose for including any description of a plant community here is to capture the current knowledge and experience at the time of this revision.

Sideoats Grama, Little Bluestem, New Mexico Feathergrass, Bigelow Sagebrush Plant Community

This plant community is the interpretive plant community for this site and is considered to be the Historic Climax Plant Community (HCPC). This community evolved with grazing by large herbivores and is suited to grazing by domestic livestock. Historically, fires likely occurred infrequently. This plant community can be found on areas that are grazed and where the grazed plants receive adequate periods of recovery during the growing season. The potential vegetation is about 70-80% grasses and grass-like, 10-15% forbs and 10-15% woody plants.

The principal grasses that dominate this community are sideoats grama, little bluestem, sideoats grama and New Mexico feathergrass. Secondary grasses are blue grama, Indian ricegrass, western wheatgrass and needleandthread. Dominant forbs include purple prairie clover, American vetch, dotted gayfeather, mat loco, sessile nailwort and Hood’s phlox. Bigelow sagebrush, winterfat, fourwing saltbush, skunkbush sumac, and golden currant are key shrubs. Oneseed juniper and pinyon pine may be present in very small amounts.

This is a sustainable plant community in terms of soil stability, watershed function and biological integrity. Litter is properly distributed where vegetative cover is continuous. Some litter movement may occur on steeper slopes. Decadence and natural plant mortality is very low. Community dynamics, nutrient cycle, water cycle and energy flow are functioning properly. This community is resistant to many disturbances except continuous grazing, tillage and/or development into urban or other uses. Areas having lost all vegetation, such as livestock and vehicle trails are subject to high erosion rates and extreme runoff.

Total annual production, during an average year, ranges from 350 to 900 pounds of air-dry weight and will average 600 pounds.

The following is the growth curve of this plant community expected during a normal year:

Growth curve number: CO6901

Growth curve name: Warm season/cool season co-dominant; MLRA-69; upland fine textured soils.

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
0	0	5	10	20	30	20	10	3	2	0	0

(monthly percentages of total annual growth)

Transitions or pathways leading to other plant communities are as follows:

- Continuous grazing without adequate recovery periods between grazing events will shift this plant community toward the *Increased Blue Grama with Decreased Mid Grasses and Shrubs Plant Community*.
- Non-use (rest) and no fire will move this plant community to the *Low Plant Density, Decadent Plants Community*. Lack of use (rest) causes the plants to become less vigorous, crowns of plants begin to die, and plant canopy begins to open up with more bare ground apparent.

- Prescribed grazing that allows for adequate recovery opportunity following each grazing event and proper stocking will maintain the *Sideoats Grama*, *Little Bluestem*, *New Mexico feathergrass*, *Bigelow Sagebrush Plant Community (HCPC)*.

Increased Blue Grama with Decreased Mid Grasses and Shrubs Plant Community

This plant community developed with continuous grazing without adequate recovery periods during the growing season. The dominant grass is typically blue grama with increased amounts of galleta. New Mexico feathergrass can increase under spring deferment or continuous summer grazing. Sideoats grama and little bluestem are still present as secondary grasses in the community. Big bluestem, Indiangrass, switchgrass, needleandthread and western wheatgrass have been significantly reduced. Forbs and shrubs that have increased are mat loco, sessile nailwort, Hood's phlox, hairy goldaster, western ragweed, slimflower scurfpea, small soapweed and broom snakeweed. Purple prairie clover, American vetch, winterfat, fourwing saltbush, currants and skunkbush sumac have been significantly reduced. Oneseed juniper and pinyon has increased above the amount that existed in the HCPC.

Plant frequency, production and litter levels are lower compared to the HCPC. Soil erosion may be a concern at this point especially on high travel or impact areas. Some flow paths may be connected and minor rilling evident. Water cycle and nutrient cycle are beginning to be affected by the reduction of key warm/cool season species, forbs and shrubs. Desertification is becoming apparent.

Total annual production can vary from 200 to 500 pounds of air-dry vegetation per acre and will average 300 pounds during an average year.

The following is the growth curve of this plant community expected during a normal year:

Growth curve number: CO6903

Growth curve name: Warm season dominant, cool season sub-dominant; MLRA-69; upland fine textured soils.

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
0	0	0	5	15	35	25	15	5	0	0	0

(monthly percentages of total annual growth)

Transitions or pathways leading to other plant communities are as follows:

- Continuous grazing without adequate recovery opportunities between grazing events will shift this plant community across an ecological threshold toward the *Blue Grama with or without Remnant Mid Grasses and Shrubs Plant Community*.
- Prescribed grazing that allows for adequate recovery periods between grazing events and proper stocking will move this plant community toward the *Sideoats Grama*, *Little Bluestem New Mexico Feathergrass*, *Bigelow Sagebrush Plant Community (HCPC)*.

Low Plant Density, Decadent Plant Community

This plant community developed under many years of non-use (rest) and lack of fire. Plant species resemble the HCPC however, species frequency and production will be reduced. Eventually, litter levels can become high enough to cause stagnation and mortality of various species such as little bluestem, sideoats grama, big bluestem, Indiangrass, switchgrass and blue grama. Bunchgrasses typically develop dead centers and rhizomatous grasses form small communities because of a lack of stimulation by grazing animals.

Initially, high surface litter levels will minimize erosion. Advanced stages of non-use (rest) or lack of fire can result in lower vigor plants, causing an increase in bare areas. These areas can be susceptible to water erosion, especially on steeper slopes.

Total annual production can vary from 250 to 950 pounds of air-dry vegetation per acre.

The following is the growth curve of this plant community expected during a normal year:

Growth curve number: CO6902

Growth curve name: Warm season/cool season co-dominant, excess litter; MLRA-69; upland fine textured soils.

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
0	0	3	7	22	33	18	12	5	0	0	0

(monthly percentages of total annual growth)

Transitions or pathways leading to other plant communities are as follows:

- Prescribed grazing that allows for adequate recovery opportunity between grazing events or prescribed burning followed by prescribed grazing will shift this plant community toward the *Sideoats Grama, Little Bluestem, New Mexico Feathergrass, Bigelow Sagebrush Plant Community (HCPC)*.

Blue Grama with or without Remnant Mid Grasses Plant Community

This plant community developed with continuous grazing without adequate recovery periods between grazing events. The dominant grass is blue grama. Hairy grama, red threeawn and galleta have increased. Tall grasses, palatable forbs and shrubs have been removed. Little bluestem and sideoats grama may exist in remnant amounts on steeper slopes. Forbs and shrubs that continue to increase are mat loco, sessile nailwort, Hood's phlox, broom snakeweed and small soapweed. Oneseed juniper and pinyon have increased significantly.

A major shift in species composition and plant functional groups has taken place. Nutrient and water cycles have been negatively affected due to the loss of nitrogen fixing forbs and deeper-rooted plants. Bare ground has increased and soil erosion is a concern. Rills and pedestaled plants with exposed roots are apparent. Desertification is advanced.

Production ranges from 75 to 300 pounds of air-dry vegetation per acre per year and will average approximately 150 pounds.

The following is the growth curve of this plant community expected during a normal year:

Growth curve number: CO6904

Growth curve name: Warm season dominant; MLRA-69; upland fine textured soils.

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
0	0	0	0	15	45	25	15	0	0	0	0

(monthly percentages of total annual growth)

Transitions or pathways leading to other plant communities are as follows:

- Continuous grazing without adequate recovery periods between grazing events will shift this plant community across an ecological threshold toward the *Increased Bare Ground, Annuals Plant Community*.
- Long-term prescribed grazing that allows for adequate recovery opportunities between grazing events and proper stocking will move this plant community toward the *Increased Blue Grama with Decreased Mid Grasses and Shrubs Plant Community* and will eventually return to the *HCPC* or associated successional plant communities assuming an adequate seed/vegetative source is/are available. This transition may take upwards of 40 years or more to achieve.

Bare Ground, Annuals Plant Community

Continuous grazing without adequate recovery opportunities following each grazing event forms this plant community. Bare ground has significantly increased. Remnant amounts of blue grama, hairy grama and galleta may exist in localized areas. Small soapweed, broom snakeweed and pricklypear cactus may remain. Annuals invading or increasing are cheatgrass, kochia and Russian thistle.

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Litter levels have been reduced substantially. Soil erosion hazard has increased due to the increase of bare ground and may be severe on steeper slopes. Biological integrity, watershed function and soil stability are all impaired. Desertification is obvious.

Total annual production can vary from 50 to 150 pounds of air-dry vegetation per acre.

The following is the growth curve of this plant community expected during a normal year:

Growth curve number: CO6903

Growth curve name: Warm season dominant, cool season sub-dominant; MLRA-69; upland fine textured soils.

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
0	0	0	5	15	35	25	15	5	0	0	0

(monthly percentages of total annual growth)

Transitions or pathways leading to other plant communities are as follows:

- Long-term prescribed grazing that allows for adequate recovery periods between grazing events and proper stocking will move this plant community toward the *Blue Grama with or without Remnant Mid Grasses and Shrubs Plant Community* assuming an adequate seed/vegetative source is present. This transition may take 40 years or more to achieve.

Ecological Site Interpretations

Animal Community – Wildlife Interpretations

The loamy soils and grasses, forbs, and shrubs found on this ecological site provides habitat for numerous wildlife species. Historic large grazers that influenced these plant communities were bison, elk, and pronghorn. Changes over time have resulted in the loss of bison, the reduction in elk numbers, and pronghorn population swings. Domestic grazers now share these habitats with wildlife. The grassland communities of eastern Colorado are home to many bird species. Changes in the composition of the plant community when moving from the HCPC to other communities on this ecological site may result in species shifts in the bird community. The occasional wetland or spring found on this ecological site provides essential seasonal water needed for reproductive habitat by some reptiles and amphibians. Because of a lack of permanent water, fish are not commonly expected on this ecological site. Mule and white-tailed deer may use this ecological site. The gray wolf and wild bison used this ecological site in historic times. The wolf is thought to be extirpated from Eastern Colorado. Bison are currently found only as domestic livestock.

Sideoats Grama, Little Bluestem, New Mexico Feathergrass, Bigelow Sagebrush Plant Community

The grasses, forbs, and shrubs in this plant community provide habitat for many reptiles including western rattlesnake, bullsnake, and racer. If water is available for breeding, spadefoot toads and tiger salamanders may be found here. The structural diversity in the plant community on this site provides habitat for Cassin's sparrow and lark bunting. Ferruginous and Swainson's hawks are commonly seen on this site. Small mammals such as white-tailed jackrabbit, badger, swift fox, plains pocket gopher, and several species of mice are common in this plant community. Pronghorn is a typical ungulate found in this community.

Increased Blue Grama with Decreased Mid Grasses and Shrubs Plant Community

All HCPC species are expected in this plant community, however, the loss of some of the vegetative structural diversity in this plant community makes it less attractive to the HCPC species.

Low Plant Density, Decadent Plant Community; Blue Grama with or without Remnant Mid Grasses Plant Community; and Bare Ground, Annuals Plant Community

Reptiles using these plant communities are similar to the HCPC species. As bare ground increases, conditions improve for Texas horned lizard. Increases in broom snakeweed and small soapweed will cause the bird community to shift from Cassin's sparrow to the grasshopper sparrow. Most mammals will be similar to the HCPC, however black-tailed jackrabbit use may increase because of the increased bare ground and weedy forbs.

Animal Preferences (Quarterly – 1,2,3,4[†])

Common Name	Cattle	Sheep	Horses	Deer	Antelope	Bison	Elk
Grasses and Grass-like							
big bluestem	U D P D	U D U U	U D P D	U D U U	U D U U	U D P D	U D P D
blue grama	D P P D	D P P D	D P P D	D P P D	D P P D	D P P D	D P P D
buffalograss	D D P D	D D P D	D D P D	D D P D	D D P D	D D P D	D D P D
galleta	N N U N	N N U N	N N U N	N N U N	N N U N	N N U N	N N U N
green needlegrass	U P D D	U P D D	U P D D	U P D D	U P D D	U P D D	U P D D
hairy tridens	N U U N	N U N N	N U U N	N U N N	N U N N	N U U N	N U U N
Indian ricegrass	D P D D	D P D D	D P D D	D P D D	D P D D	D P D D	D P D D
Indiangrass	U D P D	U D U U	U D P D	U D U U	U D U U	U D P D	U D P D
little bluestem	U D P U	N D D N	U D P U	N D D N	N D D N	U D P U	U D P U
needleandthread	U P D D	N D N D	U P D D	N D N D	N D N D	U P D D	U P D D
New Mexico feathergrass	N P D U	N D D U	N P D U	N D D U	N D D U	N P D U	N P D U
pinyon ricegrass	U P D U	U D D U	U P D U	U D D U	U D D U	U P D U	U P D U
prairie sandreed	U D D U	U D U U	U D D U	U U D U	U U D U	U D D U	U D D U
sideoats grama	U D P U	U D P U	U D P U	U D P U	U D P U	U D P U	U D P U
silver bluestem	N N U N	N N U N	N N U N	N N U N	N N U N	N N U N	N N U N
switchgrass	U D D U	U D U U	U D D U	N N N N	N N N N	U D D U	U D D U
western wheatgrass	U P D D	U P D D	U P D D	U P D D	U P D D	U P D D	U P D D
Forbs							
American vetch	D P P D	D P P D	D P P D	D P P D	D P P D	D P P D	D P P D
Colorado greenthread	U U U U	N N N N	U U U U	N N N N	N N N N	U U U U	U U U U
desert Indian paintbrush	N U N N	N U D N	N U N N	N U D N	N U D N	N U N N	N U N N
desert princesplume	T T T T	T T T T	T T T T	T T T T	T T T T	T T T T	T T T T
dotted gayfeather	U U D U	U D P U	U U D U	U D P U	U D P U	U U D U	U U D U
Fremont goldenweed	U U U U	N U U N	U U U U	N U U N	N U U N	U U U U	N U U N
ironplant goldenweed	U D D U	U P P U	U D D U	U P P U	U P P U	U D D U	U D D U
James' cryptantha	N N N N	N N U N	N N N N	N N U N	N N U N	N N N N	N N N N
Louisiana sagewort	U U U U	U U D U	U U U U	U U D U	U U D U	U U U U	U U D U
mat loco	U U U U	U D U U	U U U U	U D U U	U D U U	U U U U	U D U U
narrowleaf penstemon	U D U U	U P P U	U D U U	U P P U	U P P U	U D U U	U P P U
plains blackfoot daisy	N N N N	N U U N	N N N N	N U U N	N U U N	N N N N	N N N N
prairie coneflower	U U D U	U P P U	U U D U	U P P U	U P P U	U U D U	U P P U
purple prairie clover	U P P D	U P P U	U P P D	U P P U	U P P U	U P P D	U P P D
scarlet globemallow	U D D U	U P P U	U D D U	U P P U	U P P U	U D D U	U D D U
silky crazyweed	T T T T	T T T T	T T T T	T T T T	T T T T	T T T T	T T T T
slimflower scurpea	N N N N	N U U N	N N N N	N U U N	N U U N	N N N N	N N N N
stemless actinea	N N N N	N U N N	N N N N	N U N N	N U N N	N N N N	N N N N
sulphur-flower buckwheat	U U D U	U U U U	U U D U	U U U U	U U U U	U U D U	U U U U
tenpetal blazingstar	U U U U	N N N N	U U U U	N N N N	N N N N	U U U U	N N N N
western ragweed	U D U U	U D U U	U D U U	U D U U	U D U U	U D U U	U D U U
woolly locoweed	T T T T	T T T T	T T T T	T T T T	T T T T	T T T T	T T T T
Shrubs							
Bigelow sage	U N U U	D U D U	U N U U	D U D U	D U D U	U N U U	U N U U
fourwing saltbush	P D D P	P D D P	P D D P	P D D P	P D D P	P D D P	P D D P
James' frankenia	N N U U	U U N U	N N U U	U U N U	U U N U	N N U U	N N U U
small soapweed	D P N D	D P N D	D P N D	D P N D	D P N D	D P N D	D P N D
winterfat	P P D P	P P P P	P P D P	P P P P	P P P P	P P D P	P P D P
Trees							
oneseed juniper	N N N N	N N N N	N N N N	N N N N	N N N N	N N N N	N N N N
pinyon pine	N N N N	N N N N	N N N N	N N N N	N N N N	N N N N	N N N N

N = not used; **U** = undesirable; **D** = desirable; **P** = preferred; **T** = toxic

[†] Quarters: 1 – Jan., Feb., Mar.; 2 – Apr., May, Jun.; 3 – Jul., Aug., Sep.; 4 – Oct., Nov., Dec.

Animal Community – Grazing Interpretations

The following table lists suggested initial stocking rates for cattle under continuous grazing (year long grazing or growing season long grazing) under normal growing conditions however, *continuous grazing is not recommended*. These are conservative estimates that should be used only as guidelines in the initial stages of the conservation planning process. Often, the current plant composition does not entirely match any particular plant community (described in this ecological site description). Because of this, a field visit is recommended, in all cases, to document plant composition and production. More precise carrying capacity estimates should eventually be calculated using the following stocking rate information along with animal preference data, particularly when grazers other than cattle are involved. Under more intensive grazing management, improved harvest efficiencies can result in an increased carrying capacity.

Plant Community	Production (lbs./acre)	Stocking Rate (AUM/acre)
Sideoats Grama, Little Bluestem, NM Feathergrass, Bigelow Sage (HCPC)	600	0.19
Increased Blue Grama w/Decreased Mid Grasses/Shrubs	300	0.09
Blue Grama with or without Remnant Mid Grasses/Shrubs	150	0.05
Low Plant Density, Decadent Plants	*	*
Annuals, Bare Ground	*	*

Grazing by domestic livestock is one of the major income-producing industries in the area. Rangelands in this area provide yearlong forage under prescribed grazing for cattle, sheep, horses and other herbivores. During the dormant period, livestock may need supplementation based on reliable forage analysis.

* Highly variable; stocking rate needs to be determined on site.

Hydrology Functions

Water is the principal factor limiting forage production on this site. This site is dominated by soils in hydrologic group B, with localized areas in hydrologic group A. Infiltration is moderate to high and runoff potential for this site is moderate depending on soil hydrologic group and ground cover. Areas where ground cover is less than 50% have the greatest potential to have reduced infiltration and higher runoff (refer to NRCS Section 4, National Engineering Handbook (NEH-4) for runoff quantities and hydrologic curves).

Recreational Uses

This site provides hunting, hiking, photography, bird watching and other opportunities. The wide varieties of plants that bloom from spring until fall have an esthetic value that appeals to visitors.

Wood Products

No appreciable wood products are present on the site.

Other Products

Commonly mined for the production of cement in Fremont and Pueblo counties.

Supporting Information

Associated Sites

- (069XY006CO) – Loamy (formerly Loamy Plains)
- (069XY064CO) – Gravel Breaks
- (069XY053CO) – Sandstone Breaks

Similar Sites

- (069XY064CO) – Gravel Breaks
[gravelly soils]
- (069XY053CO) – Sandstone Breaks
[sandier, less calcareous soils]

Inventory Data References

Information presented here has been derived from NRCS clipping data, numerous ocular estimates and other inventory data. Field observations from experienced range trained personnel were used extensively to develop this ecological site description. Specific data information is contained in individual landowner/user case files and other files located in county NRCS field offices.

Those involved in developing this site description include: Ben Berlinger, Rangeland Management Specialist, NRCS; Scott Woodall, Rangeland Management Specialist, NRCS; Lee Neve, Soil Scientist, NRCS; Julie Elliott, Rangeland Management Specialist, NRCS; Terri Skadeland, Biologist, NRCS.

State Correlation

N/A

Field Offices

Canon City, Colorado Springs, Cheyenne Wells, Eads, Holly, Hugo, Lamar, Las Animas, Pueblo, Rocky Ford, Simla, Springfield, Trinidad, Walsenburg

Other References

High Plains Regional Climate Center, University of Nebraska, 830728 Chase Hall, Lincoln, NE 68583-0728. (<http://hpcc.unl.edu>)

USDA, NRCS. National Water and Climate Center, 101 SW Main, Suite 1600, Portland, OR 97204-3224. (<http://wcc.nrcs.usda.gov>)

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Site Description Approval

/s/

03/25/2004

State Range Management Specialist

Date