

## United States Department of Agriculture Natural Resources Conservation Service

### Ecological Site Description

**Site Type:** Rangeland

**Site Name:** Shallow Siltstone

**Site ID:** R067BY039CO

**Major Land Resource Area:** 67B – Central High Plains, Southern Part

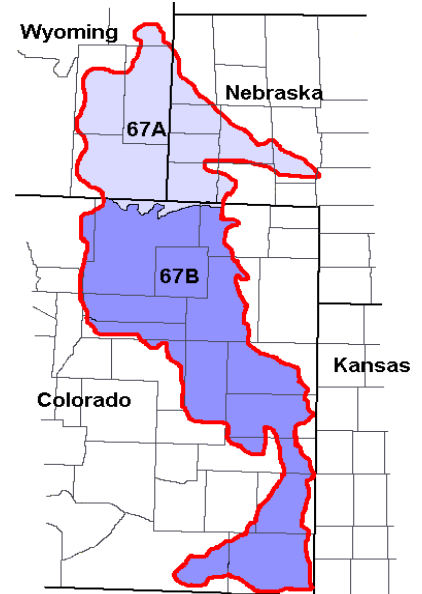
### Physiographic Features

This site occurs on level to moderately sloping plains and is closely associated with areas of barren exposures of the Brule formation.

**Landform:** plains, hills

**Aspect:** N/A

	<u>Minimum</u>	<u>Maximum</u>
<b>Elevation (feet):</b>	3800	5600
<b>Slope (percent):</b>	0	9
<b>Water Table Depth (inches):</b>	60	60
<b>Flooding:</b>		
<b>Frequency:</b>	none	none
<b>Duration:</b>	none	none
<b>Ponding:</b>		
<b>Depth (inches):</b>	0	0
<b>Frequency:</b>	none	none
<b>Duration:</b>	none	none
<b>Runoff Class:</b>	low	medium



### Climatic Features

The mean average annual precipitation varies from 12 to 16 inches per year depending on location and ranges from less than 8 inches to over 20 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 but averages 35 to 45 inches per year. Winds are estimated to average about 9 miles per hour annually, ranging from 10 miles per hour during the spring to 9 miles per hour during late summer. Daytime winds are generally stronger than nighttime and occasional strong storms may bring periods of high winds with gusts to more than 90 miles per hour.

The average length of the growing season is 142 days, but varies from 129 to 154 days. The average date of first frost in the fall is September 28, and the last frost in the spring is about May 9. July is the hottest month and December and January are 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 -35 degrees F or lower.

Site Type: Rangeland  
MLRA: 67B – Central High Plains, Southern Part

Shallow Siltstone  
R067BY039CO

Growth of native cool season plants begins about March 15 and continues to about June 15. Native warm season plants begin growth about May 15 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):	129	154
Freeze-free period (days):	151	178
Mean Annual Precipitation (inches):	12	16

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

	Precip. Min.	Precip. Max	Temp. Min.	Temp. Max.
January	0.32	0.36	12.0	45.1
February	0.26	0.38	15.9	50.9
March	0.83	0.87	22.3	58.9
April	1.28	1.38	30.1	69.1
May	2.32	2.49	39.9	78.0
June	1.93	2.57	49.0	88.7
July	1.42	2.31	55.0	93.9
August	1.07	2.38	53.5	91.9
September	1.02	1.40	43.8	83.8
October	0.89	1.00	32.5	72.9
November	0.52	0.53	20.9	57.4
December	0.34	0.37	11.9	46.9

Climate Stations		Period	
Station ID	Location or Name	From	To
CO0945	Briggsdale	1948	2000
CO4076	Holly	1918	2000
CO9147	Windsor	1948	1990

For local climate stations that may be more representative, refer to <http://www.wcc.nrcs.usda.gov>.

## 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 dominantly shallow to moderately deep, but include very deep, well drained, and moderately permeable. These soils occur on hills and plains. Most soils have bedrock at depths of 20 to 40 inches, but the Mitchell soils have bedrock greater than 60 inches. The available water capacity is typically very low to moderate. The soil surface layer is typically 3 to 12 inches thick.

Exposed areas of siltstone bedrock 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. Sub-surface soil layers, where not affected by bedrock, are non-restrictive to water movement and root penetration.

The hazard of water erosion increases on steeper slopes. Some flow paths, rills and pedestaled plants may be evident.

Major soil series correlated to this ecological site include: Keota, Epping

Other soil series that have been correlated to this site include: Mitchell\*

\* Mitchell soils are very deep and should be correlated to the Siltstone ESD.

**Parent Material Kind:** residuum  
**Parent Material Origin:** siltstone  
**Surface Texture:** loam, silt loam  
**Surface Texture Modifier:** none

**Subsurface Texture Group:** loamy  
**Surface Fragments  $\leq 3''$  (% Cover):** 0  
**Surface Fragments  $> 3''$  (%Cover):** 0  
**Subsurface Fragments  $\leq 3''$  (% Volume):** 0 - 10  
**Subsurface Fragments  $> 3''$  (% Volume):** 0

	<u>Minimum</u>	<u>Maximum</u>
<b>Drainage Class:</b>	well	well
<b>Permeability Class:</b>	moderate	moderate
<b>Depth (inches):</b>	10	>60
<b>Electrical Conductivity (mmhos/cm)*:</b>	0	2
<b>Sodium Absorption Ratio*:</b>	0	0
<b>Soil Reaction (1:1 Water)*:</b>	6.6	8.4
<b>Available Water Capacity (inches)*:</b>	2.5	8.5
<b>Calcium Carbonate Equivalent (percent)*:</b>	0	15

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

## Plant Communities

### Ecological Dynamics of the Site:

Continuous grazing that does not allow for adequate recovery opportunities between grazing events causes this site to deteriorate. Grasses such as western wheatgrass, little bluestem, sideoats grama and green needlegrass decrease in both frequency and production. Grasses and grass-like species such as blue grama, buffalograss and threadleaf sedge will increase. If proper recovery periods between grazing events are not allowed during the growing season, blue grama and buffalograss will form a dense sod on the flatter areas of the site. Mid and tall grasses and palatable forbs and shrubs will eventually be removed from the plant community. Cushion plants such as mat loco and sessile nailwort in addition to red threeawn, fringed sagebrush, small soapweed and cheatgrass will increase or invade the site. In time, continuous use in combination with high stock densities or long term non-use (rest) and lack of fire will result in large amounts of bare ground.

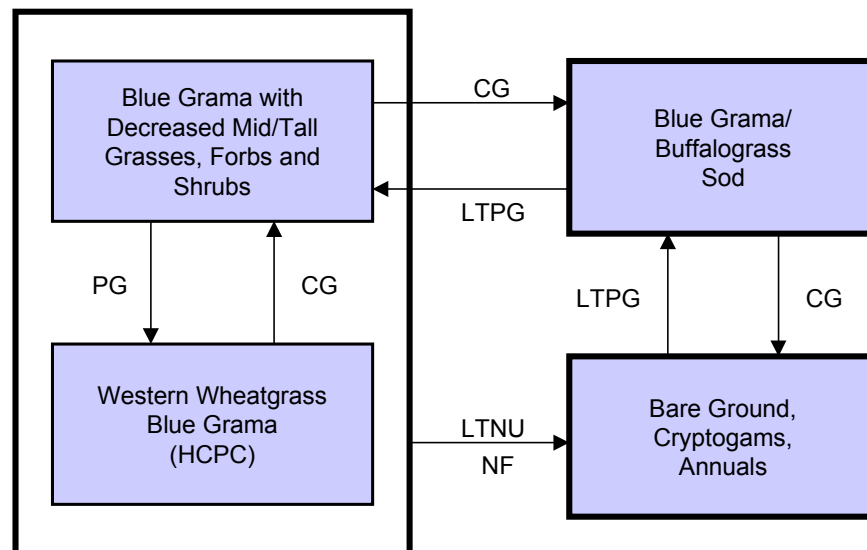
This site can contain areas of barren exposures of siltstone bedrock. Soils are shallow and erosion is inherent to the site. *Tillage is not recommended on this site due to shallow soils and associated low production potential.*

Wyoming feverfew (*Parthenium alpinum*) has been found on this site and is listed in the Colorado Rare Plant Field Guide.

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 diagram 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 are 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  
**LTNU** - long term non-use (>40 years)  
**LTPG** - long-term prescribed grazing (>40 years)  
**NF** - no fire  
**PG** - prescribed grazing with adequate recovery opportunity

Plant Community Composition and Group Annual Production

			Western Wheatgrass, Blue Grama (HCPC)		
COMMON/GROUP NAME	SCIENTIFIC NAME	SYMBOL	Group	lbs./acre	% Comp
GRASSES & GRASS-LIKES			1	560 - 640	70 - 80
blue grama	Bouteloua gracilis	BOGR2	1	200 - 240	25 - 30
western wheatgrass	Pascopyrum smithii	PASM	1	200 - 240	25 - 30
sideoats grama	Bouteloua curtipendula	BOCU	1	80 - 120	10 - 15
little bluestem	Schizachyrium scoparium	SCSC	1	40 - 120	5 - 15
green needlegrass	Nassella viridula	NAVI4	1	8 - 56	1 - 7
buffalograss	Buchloe dactyloides	BUDA	1	8 - 40	1 - 5
big bluestem	Andropogon gerardii	ANGE	1	8 - 24	1 - 3
switchgrass	Panicum virgatum	PAVI2	1	8 - 24	1 - 3
hairy grama	Bouteloua hirsuta	BOHI2	1	8 - 16	1 - 2
needleandthread	Hesperostipa comata ssp. comata	HECOC8	1	8 - 16	1 - 2
sand dropseed	Sporobolus cryptandrus	SPCR	1	8 - 16	1 - 2
bottlebrush squirreltail	Elymus elymoides ssp. elymoides	ELELE	1	0 - 8	0 - 1
Indian ricegrass	Achnatherum hymenoides	ACHY	1	0 - 8	0 - 1
Indiangrass	Sorghastrum nutans	SONU2	1	0 - 8	0 - 1
plains muhly	Muhlenbergia cuspidata	MUCU3	1	0 - 8	0 - 1
prairie junegrass	Koeleria macrantha	KOMA	1	0 - 8	0 - 1
red threeawn	Aristida purpurea var. longiseta	ARPUL	1	0 - 8	0 - 1
thickspike wheatgrass	Elymus lanceolatus ssp. lanceolatus	ELLAL	1	0 - 8	0 - 1
sun sedge	Carex inops ssp. heliophila	CAINH2	1	8 - 16	1 - 2
threadleaf sedge	Carex filifolia	CAFI	1	8 - 16	1 - 2
other perennial grasses		2GP	1	8 - 40	1 - 5
FORBS			2	80 - 120	10 - 15
purple prairie clover	Dalea purpurea	DAPU5	2	8 - 16	1 - 2
American vetch	Vicia americana	VIAM	2	0 - 8	0 - 1
annual buckwheat	Eriogonum annuum	ERAN4	2	0 - 8	0 - 1
Colorado greenthread	Thelesperma filifolium	THFI	2	0 - 8	0 - 1
cutleaf evening-primrose	Oenothera coronopifolia	OECO2	2	0 - 8	0 - 1
dotted gayfeather	Liatris punctata	LIPU	2	0 - 8	0 - 1
goldenpea	Thermopsis rhombifolia	THRH	2	0 - 8	0 - 1
hairy goldaster	Heterotheca villosa	HEVI4	2	0 - 8	0 - 1
Hood's phlox	Phlox hoodii	PHHO	2	0 - 8	0 - 1
ironplant goldenweed	Machaeranthera pinnatifida ssp. pinnatifida var. pinnatifida	MAPIP4	2	0 - 8	0 - 1
Lambert crazyweed	Oxytropis lambertii	OXLA3	2	0 - 8	0 - 1
mat loco	Astragalus kentrophyta	ASKE	2	0 - 8	0 - 1
narrowleaf penstemon	Penstemon angustifolius	PEAN4	2	0 - 8	0 - 1
narrowleaf poisonvetch	Astragalus pectinatus	ASPE5	2	0 - 8	0 - 1
rush skeletonplant	Lygodesmia juncea	LYJU	2	0 - 8	0 - 1
scarlet globemallow	Sphaeralcea coccinea	SPCO	2	0 - 8	0 - 1
sessile nailwort	Paronychia sessiliflora	PASE	2	0 - 8	0 - 1
silky crazyweed	Oxytropis sericea	OXSE	2	0 - 8	0 - 1
slimflower scurfpea	Psoralidium tenuiflorum	PSTE5	2	0 - 8	0 - 1
sulfur-flower buckwheat	Eriogonum umbellatum	ERUM	2	0 - 8	0 - 1
threadleaf groundsel	Senecio flaccidus var. flaccidus	SEFLF	2	0 - 8	0 - 1
twogrooved milkvetch	Astragalus bisulcatus	ASBI2	2	0 - 8	0 - 1
upright prairie coneflower	Ratibida columnifera	RACO3	2	0 - 8	0 - 1
variable senecio	Packera neomexicana var. mutabilis	PANEM	2	0 - 8	0 - 1
western ragweed	Ambrosia psilostachya	AMPS	2	0 - 8	0 - 1
woolly Indianwheat	Plantago patagonica	PLPA2	2	0 - 8	0 - 1
woolly locoweed	Astragalus mollissimus	ASMO7	2	0 - 8	0 - 1
wormwood	Artemisia dracunculus	ARDR4	2	0 - 8	0 - 1
Wyoming feverfew	Parthenium alpinum	PAAL6	2	0 - 8	0 - 1
other perennial forbs		2FP	2	8 - 40	1 - 5
SHRUBS			3	80 - 120	10 - 15
winterfat	Krascheninnikovia lanata	KRLA2	3	24 - 80	3 - 10
fourwing saltbush	Atriplex canescens	ATCA2	3	16 - 56	2 - 7
skunkbush sumac	Rhus trilobata	RHTR	3	8 - 24	1 - 3
broom snakeweed	Gutierrezia sarothrae	GUSA2	3	0 - 8	0 - 1
chokecherry	Prunus virginiana var. virginiana	PRVIV	3	0 - 8	0 - 1
fringed sagebrush	Artemisia frigida	ARFR4	3	0 - 8	0 - 1
golden currant	Ribes aureum	RIAU	3	0 - 8	0 - 1
green plume rabbitbrush	Ericameria nauseosa ssp. nauseosa var. glabrata	ERNAG	3	0 - 8	0 - 1
small soapweed	Yucca glauca	YUGL	3	0 - 8	0 - 1
wax currant	Ribes cereum	RICE	3	0 - 8	0 - 1
other shrubs		2SHRUB	3	8 - 40	1 - 5
Annual Production lbs./acre			LOW RV* HIGH		
GRASSES & GRASS-LIKES			350 - 600 - 750		
FORBS			75 - 100 - 125		
SHRUBS			75 - 100 - 125		
TOTAL			500 - 800 - 1000		

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 or annual production of a normal or representative year.

## 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.

### Western Wheatgrass, Blue Grama 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 very infrequently, if at all. 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.

Western wheatgrass and blue grama dominate the community. Other key plants of secondary importance are little bluestem, sideoats grama, green needlegrass, purple prairie clover, winterfat and fourwing saltbush. Big bluestem, switchgrass and Indiangrass occur in small amounts. Threadleaf sedge and sun sedge are common.

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. Areas having lost all vegetation, such as livestock and vehicle trails are subject to high erosion rates and extreme runoff depending on storm intensity and duration. This community is resistant to many disturbances except continuous grazing, tillage and/or development into urban or other uses.

Total annual production, during an average year, ranges from 500 to 1000 pounds of air-dry weight and will average 800 pounds.

The following is an estimated growth curve of this plant community expected during a normal year. Vegetative growth begins earlier in the southern reaches (Baca, Bent, Kiowa, Las Animas and Prowers counties) of MLRA-67B. Vegetative growth will typically be suppressed during the months of June through August in these counties due to higher evapotranspiration rates.

Growth curve number: CO6708

Growth curve name: Warm season/cool season co-dominant; MLRA-67B; upland fine textured soils.

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
0	0	2	8	20	35	18	10	5	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 to the *Blue Grama with Decreased Mid/Tall Grasses, Forbs and Shrubs Plant Community*.
- Long term non-use (rest) and absence of fire will move this plant community to the *Bare Ground, Annuals, Cryptogams Plant Community*. This transition can take 40 years or more to achieve.

- Prescribed grazing that allows for adequate recovery opportunity following each grazing event and proper stocking will maintain the *Western Wheatgrass, Blue Grama Plant Community (HCPC)*.

### **Blue Grama with Decreased Mid/Tall Grasses, Forbs and Shrubs Plant Community**

This plant community developed with continuous grazing without adequate recovery periods during the growing season. The dominant grass is blue grama. Western wheatgrass, little bluestem, sideoats grama, green needlegrass, purple prairie clover, winterfat and fourwing saltbush have been significantly reduced. Big bluestem, Indiangrass and switchgrass occur in remnant amounts. Hairy grama, sand dropseed, red threeawn as well as mat loco, sessile nailwort, Hood's phlox, hairy goldaster, western ragweed, slimflower scurfpea small soapweed have increased.

Plant frequency and vigor have decreased. Reduction of tall, mid and rhizomatous wheatgrass, nitrogen fixing forbs, shrub component and increased warm season short grass has begun to alter the biotic integrity of this community. Water and nutrient cycles are becoming impaired. Litter levels have been reduced. Flow paths and rills are more apparent. Pedestalled plants may be present. Desertification is in an early stage.

Total annual production, during an average year, ranges from 300 to 700 pounds of air-dry weight and will average 450 pounds.

The following is an estimated growth curve of this plant community expected during a normal year. Vegetative growth begins earlier in the southern reaches (Baca, Bent, Kiowa, Las Animas and Prowers counties) of MLRA-67B. Vegetative growth will typically be suppressed during the months of June through August in these counties due to higher evapotranspiration rates.

Growth curve number: CO6702

Growth curve name: Warm season dominant, cool season sub-dominant; MLRA-67B, upland fine textured soils.

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
0	0	0	2	15	45	20	15	3	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 to the *Blue Grama/Buffalograss Sod Plant Community*.
- Prescribed grazing that allows for adequate recovery opportunities between grazing events and proper stocking will return this plant community to the *Western Wheatgrass, Blue Grama Plant Community (HCPC)*.
- Long term non-use (rest) and no fire will move this plant community to the *Bare Ground, Annuals, Cryptogams Plant Community*. This transition can take 40 years or more to achieve.

### **Blue Grama/Buffalograss Sod Plant Community**

This plant community developed with continuous grazing without adequate recovery periods between grazing events. Blue grama and buffalograss dominate the community. These species have been developed into a sodbound condition on level areas. Tall grasses, palatable forbs and shrubs have been removed. Little bluestem and sideoats grama may remain in remnant amounts. Forbs and shrubs that have increased are Hood's phlox, hairy goldaster, fringed sagebrush and small soapweed. Cushion plants such as mat loco and sessile nailwort have increased. Threadleaf sedge has likely increased.

Species diversity and production have been severely reduced. Litter levels are low. Mineral and water cycles are impaired due to the loss of deeper-rooted grasses, forbs and shrubs. Soil erosion is a concern on steeper slopes. Flow paths, rills and early gully formation are more obvious on exposed siltstone areas. Desertification is advanced.

Production ranges from 150 to 450 pounds of air-dry vegetation per acre per year and averages 250 pounds.

The following is an estimated growth curve of this plant community expected during a normal year. Vegetative growth begins earlier in the southern reaches (Baca, Bent, Kiowa, Las Animas and Prowers counties) of MLRA-67B. Vegetative growth will typically be suppressed during the months of June through August in these counties due to higher evapotranspiration rates.

Growth curve number: CO6707

Growth curve name: Warm season dominant; MLRA-67B; upland fine textured soils.

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
0	0	0	3	20	45	20	10	2	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 following each grazing event will shift this plant community across and ecological threshold toward the *Bare Ground, Cryptogams, Annuals Plant Community*.
- Long term prescribed grazing with adequate recovery periods between grazing events and proper stocking will move this plant community toward the *Blue Grama with Decreased Mid/Tall Grasses, Forbs and Shrubs Plant Community* assuming an adequate seed source and/or remnant plants is/are available. This transition may take 40 years or more to achieve.

### **Bare Ground, Cryptogams, Annuals Plant Community**

Continuous grazing without adequate recovery opportunity during the growing season causes this plant community to develop. Bare ground, cushion plants and cryptogamic crusts have significantly increased. Remnant amounts of blue and/or hairy grama may still be found in localized areas. Other plants which may be present are Russian thistle, kochia, red threeawn, cheatgrass, cushion plants (mat loco, sessile nailwort) and small soapweed.

Soil erosion is severe. Desertification is obvious.

Total annual production can vary from 25 to 150 pounds of air-dry vegetation per acre per year.

The following is an estimated growth curve of this plant community expected during a normal year. Vegetative growth begins earlier in the southern reaches (Baca, Bent, Kiowa, Las Animas and Prowers counties) of MLRA-67. Vegetative growth will typically be suppressed during the months of June through August in these counties due to higher evapotranspiration rates.

Growth curve number: CO6707

Growth curve name: Warm season dominant; MLRA-67B; upland fine textured soils.

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
0	0	0	3	20	45	20	10	2	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 adequate recovery periods following each grazing event will move this plant community toward the *Blue Grama/Buffalograss Sod Plant Community* assuming an adequate seed/vegetative source is available. This transition may take 40 years or more to achieve.



## Ecological Site Interpretations

### Animal Community – Wildlife Interpretations

#### Western Wheatgrass, Blue Grama Plant Community

Common bird species expected on the HCPC include Cassin's sparrow, chestnut collared longspur, lark bunting, western meadowlark, and ferruginous and Swainson's hawks. White-tailed and black-tailed jackrabbit, badger, pronghorn, coyote, swift fox, plains pocket gopher, long-tailed weasel, and several species of mice are mammals that commonly use this plant community. Reptiles using this community include western rattlesnake, bullsnake, plains garter snake (if water is in home range), western hognose snake, racer, western box turtle, and six-lined racerunner.

#### Blue Grama with Decreased Mid/Tall Grasses, Forbs and Shrubs Plant Community

The reduction of shrubs and taller grasses in this plant community results in a shift of bird species away from the HCPC birds. Lark bunting, chestnut-collared longspur, and western meadowlark use declines and Cassin's sparrow stop using the community altogether. Habitat conditions are ideal for long-billed curlew. McCown's longspur, burrowing owl, mountain plover, killdeer, and horned lark begin using this community. Ferruginous and Swainson's hawks are frequent users of this community.

Most mammals will be the same as in the HCPC, however jackrabbit, black-tailed prairie dog, desert cottontail, and thirteen-lined ground squirrel use will increase because of the changing plant community. Reptiles using this community are the same as in the HCPC.

#### Blue Grama/Buffalograss Sod Plant Community and Bare Ground, Cryptogams, Annuals Plant Communities

Burrowing owl, mountain plover, horned lark, McCown's longspur, killdeer, and long-billed curlew use these plant communities although mountain plover will avoid areas where slopes are greater than 5 percent. With the exception of the hawk species, no HCPC bird species would be expected in these communities. Jackrabbit, black-tailed prairie dog, thirteen-lined ground squirrel, and desert cottontail rabbit are frequent users of these communities. All other mammal species from the HCPC may use these communities. Reptiles using these communities exclusively are short-horned lizard and lesser earless lizard. Other reptiles using these communities include the species listed for the HCPC.

#### Other Potential Species

The plains spadefoot is the only common species of frog or toad inhabiting grasslands in Eastern Colorado. This species requires water for breeding. Tiger salamanders may be found on grassland sites, but require a water body for breeding. Either of these species may be found in any plant community if seasonal water requirements are met. Mule and white-tailed deer may use this ecological site, however the shrub cover is too low to provide escape or hiding cover. On ecological site locations near riparian areas, deer will use the vegetation for feeding. Big brown bats will use any plant community on this ecological site if a building site is in the area. The gray wolf, black-footed ferret, and wild bison used this ecological site in historic times. The wolf and ferret are thought to be extirpated from Eastern Colorado. Bison are currently found only as domestic livestock.

## Animal Preferences (Quarterly – 1,2,3,4<sup>†</sup>)

Common Name	Cattle	Sheep	Horses	Deer	Antelope	Bison	Elk
<b>Grasses and Grass-like</b>							
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
bottlebrush squirreltail	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
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
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 grama	U D P U	D P P D	U D P U	D P P D	D P P D	U D P U	U D P U
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
plains muhly	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 U D U
prairie junegrass	U D U D	N D N U	U D U D	N D N U	N D N U	U D U D	U D U D
red threeawn	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
sand dropseed	U D U N	N U D N	U D U N	N U D N	N U D N	U D U N	U D U N
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
switchgrass	U D D U	U D U U	U D D U	U D U U	U D U U	U D D U	U D D U
thickspike wheatgrass	U D D U	N D N N	U D D U	N D N N	N D 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
sun sedge	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
threadleaf sedge	U D U D	U P N D	U D U D	U P N D	U P N D	U D U D	U D U D
<b>Forbs</b>							
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
annual buckwheat	U U U U	N U U N	U U U U	N U U N	N U U N	U U U U	U U U U
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
cutleaf evening-primrose	U U U U	N U U N	U U U U	N U U N	N U U N	U U U U	U U U U
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
goldenpea	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 U U U
hairy goldaster	U U D U	N N N N	U U D U	N N N N	N N N N	U U D U	U U D U
Hood's phlox	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 D U U
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
Lambert 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
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 U 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 D U U
narrowleaf poisonvetch	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 U U 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
rush skeletonplant	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
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 scurfspea	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
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 D U
twogrooved milkvetch	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
upright 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 U D U
woolly Indianwheat	U U U U	U U U U	U U U U	U U U U	U U U U	U U U U	U U U U
<b>Shrubs</b>							
broom snakeweed	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
chokecherry	D T T D	D T T D	D T T D	D T T D	D T T D	D T T D	D T T D
currant	D U U D	D U U D	D U U D	D U U D	D U U D	D U U D	D U U D
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
fringed sagebrush	U N N U	U D D U	U N N U	U D D U	U D D U	U N N U	U N N U
skunkbush sumac	D U U D	D U U D	D U U D	D U U D	D U U D	D U U D	D U U D
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 P P	P P P P	P P P P	P P P P	P P P P	P P P P	P P P P

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

<sup>†</sup> 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)
Western Wheatgrass, Blue Grama (HCPC)	800	0.26
Increased Blue Grama; Decreased Grasses, Forbs, Shrubs	450	0.14
Blue Grama/Buffalograss Sod	250	0.08
Bare Ground, Cryptogams, Annuals	*	*

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. Infiltration and runoff potential for this site is moderate depending on 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

None noted.

## **Supporting Information**

### **Associated Sites**

- (R067BY002CO) – Loamy (formerly Loamy Plains)
- (R067BY008CO) – Loamy Slopes
- (R067BY039CO) – Siltstone Plains
- (R067BY056CO) – Sandstone Breaks
- (R067BY060CO) – Limestone Breaks

### **Similar Sites**

- (R067BY060CO) – Limestone Breaks  
[higher production, more tall grasses, less blue grama]
- (R067BY056CO) – Sandstone Breaks  
[higher production, prairie sandreed present]

### **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: Harvey Sprock, Rangeland Management Specialist, NRCS; Ben Berlinger, Rangeland Management Specialist, NRCS; James Borchert, Soil Scientist, NRCS; Terri Skadeland, Biologist, NRCS.

### **State Correlation**

This site is unique to Colorado.

### **Field Offices**

Akron, Fort Collins, Fort Morgan, Greeley, Sterling

## Other References

High Plains Regional Climate Center, University of Nebraska, 830728 Chase Hall, Lincoln, NE 68583-0728. (<http://hpccsun.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

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State Range Management Specialist

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Date