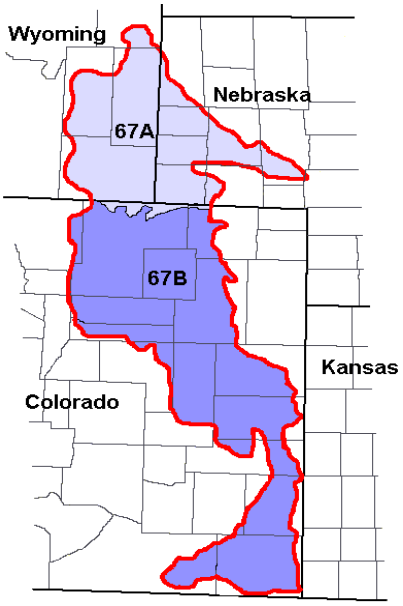
United States Department of Agriculture
Natural Resources Conservation Service

Ecological Site Description



Site Type: Rangeland

Site Name: Gravel Breaks

Site ID: R067BY063CO

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

Physiographic Features

This site occurs on nearly level to steep hills.

Landform: alluvial fans, hills

Aspect: N/A

	Minimum	Maximum
Elevation (feet):	3800	5600
Slope (percent):	1	45
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:	very low	low

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.

Growth of native cool season plants begins about March 15 and continues to about June15. 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.

	Minimum	Maximum
Frost-free period (days):	129	154
Freeze-free period (days):	151	178
Mean Annual Precipitation (inches):	12	16

Average Monthly Precipitation (inches) and Temperature (ºF):

	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:	**System**	**Subsystem**	**Class**	**Sub-class**
None	None	None	None	None

Stream Type: None

Representative Soil Features

The soils of this site are deep to very deep, excessive to well drained, and rapidly to moderately permeable. These soils occur on hills and alluvial fans. Some soils have rock fragments at depths of 6 to 60 inches. The available water capacity is typically very low. The soil surface layer is typically 2 to 10 inches thick.

Exposed areas of gravel are inherent to this site. The amount of bare ground varies with the amount of surface gravel. 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, bare areas may increase. Expect to find evidence of water flow patterns and pedestaled plants. Sub-surface soil layers, where not affected by gravel, are non-restrictive to water movement and root penetration.

Major soil series correlated to this ecological site include: Eckley, Dix, Karval, Yoder, Cascajo, Orsa, Peetz, Schamber

Other soil series that have been correlated to this site include: none

Parent Material Kind: alluvium
Parent Material Origin: mixed
Surface Texture: gravelly loamy sand, gravelly sandy loam, gravelly loam
Surface Texture Modifier: gravelly

Subsurface Texture Group: typically is sandy, but also includes loamy over sandy
Surface Fragments ≤ 3" (% Cover): 0-20
Surface Fragments > 3" (%Cover): 0-15
Subsurface Fragments ≤ 3" (% Volume): 0-80
Subsurface Fragments > 3" (% Volume): 0-30

	Minimum	Maximum
Drainage Class:	somewhat excessive	well
Permeability Class:	rapid	moderate
Depth (inches):	60	80
Electrical Conductivity (mmhos/cm)*:	0	2
Sodium Absorption Ratio*:	0	0
Soil Reaction (1:1 Water)*:	6.0	8.4
Available Water Capacity (inches)*:	2	3
Calcium Carbonate Equivalent (percent)*:	0	25

*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 little bluestem, sideoats grama, prairie sandreed, switchgrass and big bluestem decrease in both frequency and production. Grasses and grass-likes such as blue grama and threadleaf sedge will increase. If proper recovery periods between grazing events are not allowed during the growing season, blue grama will eventually develop into a patchy sodbound condition. Mid and tall grasses will eventually be removed from the plant community. Cushion plants such as mat loco and sessile nailwort in addition to red threeawn, wormwood, 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.

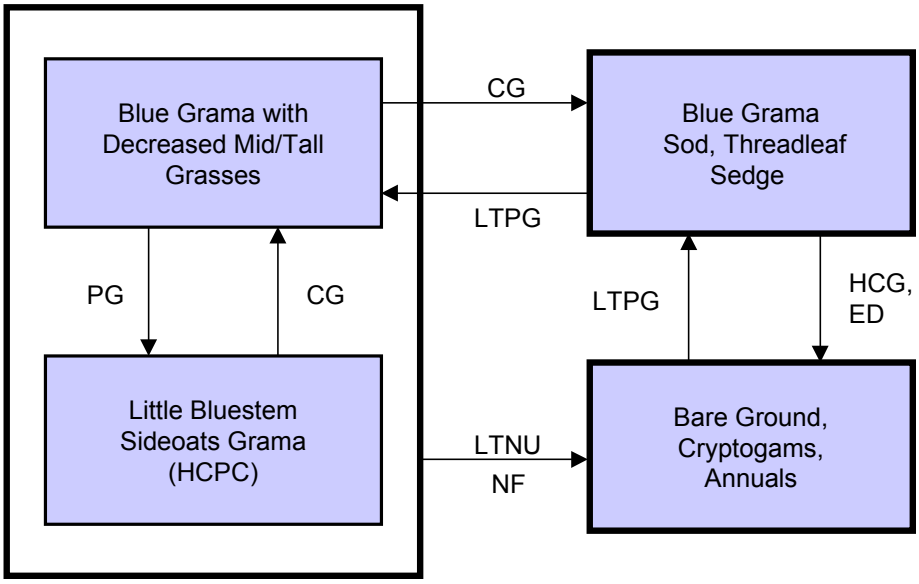
Tillage is not recommended on this site due to steep shallow soils and associated low production potential.

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 durationl/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, **ED -** excessive defoliation, **HCG -** heavy continuous grazing, **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

			Little Bluestem, Sideoats Grama HCPC		
COMMON/GROUP NAME	**SCIENTIFIC NAME**	**SYMBOL**	**Group**	**lbs./acre**	**% Comp**
GRASSES & GRASS-LIKES					
WARM SEASON MID BUNCH GRASS			***1***	***285 - 428***	***30 - 45***
little bluestem	Schizachyrium scoparium	SCSC	1	143 - 238	15 - 25
sideoats grama	Bouteloua curtipendula	BOCU	1	143 - 238	15 - 25
sand dropseed	Sporobolus cryptandrus	SPCR	1	10 - 19	1 - 2
WARM SEASON SHORT GRASS			***2***	***48 - 95***	***5 - 10***
blue grama	Bouteloua gracilis	BOGR2	2	48 - 95	5 - 10
hairy grama	Bouteloua hirsuta	BOHI2	2	10 - 29	1 - 3
buffalograss	Buchloe dactyloides	BUDA	2	0 - 10	0 - 1
WARM SEASON TALL RHIZMATOUS GRASS			***3***	***10 - 67***	***1 - 7***
prairie sandreed	Calamovilfa longifolia	CALO	3	10 - 67	1 - 7
WARM SEASON TALL BUNCH GRASS			***4***	***29 - 95***	***3 - 10***
big bluestem	Andropogon gerardii	ANGE	4	19 - 76	2 - 8
Indiangrass	Sorghastrum nutans	SONU2	4	0 - 19	0 - 2
switchgrass	Panicum virgatum	PAVI2	4	10 - 48	1 - 5
COOL SEASON MID BUNCH GRASS			***5***	***29 - 67***	***3 - 7***
needleandthread	Hesperostipa comata ssp. comata	HECOC8	5	10 - 48	1 - 5
Indian ricegrass	Achnatherum hymenoides	ACHY	5	10 - 19	1 - 2
bottlebrush squirreltail	Elymus elymoides ssp. elymoides	ELELE	5	0 - 10	0 - 1
prairie junegrass	Koeleria macrantha	KOMA	5	0 - 10	0 - 1
COOL SEASON MID RHIZMATOUS GRASS			***6***	***10 - 67***	***1 - 3***
western wheatgrass	Pascopyrum smithii	PASM	6	10 - 29	1 - 3
MISCELLANEOUS GRASSES			***7***	***0 - 19***	***0 - 2***
plains muhly	Muhlenbergia cuspidata	MUCU3	7	0 - 10	0 - 1
red threeawn	Aristida purpurea var. longiseta	ARPUL	7	0 - 10	0 - 1
ring muhly	Muhlenbergia torreyi	MUTO2	7	0 - 10	0 - 1
ANNUALS			***8***	***0 - 10***	***0 - 1***
sixweeks fescue	Vulpia octoflora	VUOC	8	0 - 10	0 - 1
SEDGES			***9***	***19 - 95***	***2 - 5***
sun sedge	Carex inops ssp. heliophila	CAINH2	9	10 - 29	1 - 3
threadleaf sedge	Carex filifolia	CAFI	9	10 - 19	1 - 2
OTHER NATIVE GRASSES		2GP	***10***	***10 - 48***	***1 - 5***
FORBS					
LEGUMES			***11***	***19 - 48***	***2 - 5***
purple prairie clover	Dalea purpurea	DAPU5	11	10 - 19	1 - 2
Lambert crazyweed	Oxytropis lambertii	OXLA3	11	0 - 10	0 - 1
silky crazyweed	Oxytropis sericea	OXSE	11	0 - 10	0 - 1
slimflower scurfpea	Psoralidium tenuiflorum	PSTE5	11	0 - 10	0 - 1
twogrooved milkvetch	Astragalus bisulcatus	ASBI2	11	0 - 10	0 - 1
woolly locoweed	Astragalus mollissimus	ASMO7	11	0 - 10	0 - 1
mat loco	Astragalus kentrophyta	ASKE	11	0 - 10	0 - 1
WARM SEASON			***12***	***48 - 95***	***5 - 10***
dotted gayfeather	Liatris punctata	LIPU	12	10 - 19	1 - 2
Colorado greenthread	Thelesperma ambiguum	THAM4	12	0 - 10	0 - 1
hairy goldaster	Heterotheca villosa	HEVI4	12	0 - 10	0 - 1
heath aster	Symphyotrichum ericoides	SYER	12	0 - 10	0 - 1
ironplant goldenweed	Machaeranthera pinnatifida ssp. pinnatifida var. pinnatifida	MAPIP4	12	0 - 10	0 - 1
Nuttall's evolvulus	Evolvulus nuttallianus	EVNU	12	0 - 10	0 - 1
rush skeletonplant	Lygodesmia juncea	LYJU	12	0 - 10	0 - 1
stiff greenthread	Thelesperma filifolium	THFI	12	0 - 10	0 - 1
sulfur-flowered buckwheat	Eriogonum umbellatum	ERUM	12	0 - 10	0 - 1
threadleaf groundsel	Senecio flaccidus var. flaccidus	SEFLF	12	0 - 10	0 - 1
upright prairie coneflower	Ratibida columnifera	RACO3	12	0 - 10	0 - 1
western ragweed	Ambrosia psilostachya	AMPS	12	0 - 10	0 - 1
wormwood	Artemisia dracunculus	ARDR4	12	0 - 10	0 - 1
COOL SEASON			***13***	***0 - 29***	***1 - 3***
scarlet globemallow	Sphaeralcea coccinea	SPCO	13	0 - 10	0 - 1
penstamon	Penstemon sp.	PENST	13	0 - 10	0 - 1
variable senecio	Packera neomexicana var. mutabilis	PANEM	13	0 - 10	0 - 1
sessile nailwort	Paronychia sessiliflora	PASE	13	0 - 10	0 - 1
Wyoming feverfew	Parthenium alpinum	PAAL6	13	0 - 10	0 - 1
ANNUALS			***14***	***0 - 10***	***0 - 1***
woolly Indianwheat	Plantago patagonica	PLPA2	14	0 - 10	0 - 1
OTHER NATIVE FORBS		2FP	***15***	***10 - 48***	***1 - 5***
SHRUBS, HALF-SHRUBS, ETC.					
SHRUBS			***16***	***19 - 76***	***2 - 8***
skunkbush sumac	Rhus trilobata	RHTR	16	0 - 29	0 - 3
chokecherry	Prunus virginiana var. virginiana	PRVIV	16	0 - 19	0 - 2
golden currant	Ribes aureum	RIAU	16	0 - 19	0 - 2
winterfat	Krascheninnikovia lanata	KRLA2	16	0 - 19	0 - 2
HALF-SHRUBS			***17***	***19 - 38***	***2 - 4***
broom snakeweed	Gutierrezia sarothrae	GUSA2	17	0 - 10	0 - 1
fringed sagebrush	Artemisia frigida	ARFR4	17	0 - 10	0 - 1
green plume rabbitbrush	Ericameria nauseosa ssp. nauseosa var. glabrata	ERNAG	17	0 - 10	0 - 1
spreading eriogonum	Eriogonum effusum	EREF	17	0 - 10	0 - 1
Hood's phlox	Phlox hoodii	PHHO	17	0 - 10	0 - 1
SUCCULENTS			***18***	***0 - 19***	***0 - 2***
purple pincushion	Escobaria vivipara var. vivipara	ESVIV	18	0 - 10	0 - 1
plains pricklypear	Opuntia polyacantha	OPPO	18	0 - 10	0 - 1
EVERGREEN			***19***	***0 - 10***	***0 - 1***
small soapweed	Yucca glauca	YUGL	19	0 - 10	0 - 1
OTHER NATIVE SHRUBS		2SHRUB	***20***	***10 - 48***	***1 - 5***

Annual Production lbs./acre	LOW	RV*	HIGH
GRASSES & GRASS-LIKES	365 -	760	- 1155
FORBS	90 -	120	- 145
SHRUBS	45 -	70	- 100
TREES			
TOTAL	500 -	950	- 1400

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.

Little Bluestem, Sideoats 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 infrequently. This plant community can be found on areas that are grazed and where the grazed plants receive adequate recovery periods during the growing season. The potential vegetation is about 75-85% grasses and grass-likes, 10-15% forbs and 5-10% woody plants.

The principal mid grasses are little bluestem and sideoats grama. Secondary grasses include blue grama, big bluestem, prairie sandreed, switchgrass, needleandthread, Indiangrass, hairy grama and western wheatgrass. Threadleaf and sun sedge are common. Dominant forbs are purple prairie clover, dotted gayfeather and upright prairie coneflower. Winterfat, skunkbush sumac and golden currant are some of the major shrubs found on this plant community.

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 500 to 1400 pounds of air-dry weight and will average 950 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: CO6709
Growth curve name: Warm season dominant, cool season sub-dominant; MLRA-67B; upland coarse textured soils.

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
0	0	2	7	25	35	15	10	5	1	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 *Blue Grama with Decreased Mid and Tall Grass Plant Community*.

- Long term non-use (rest) and no fire will move this plant community across an ecological threshold toward the *Bare Ground, Annuals, Cryptogams Plant Community.* This transition may 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 *Little Bluestem, Sideoats Grama Plant Community (HCPC).*

Blue Grama with Decreased Mid and Tall Grass Plant Community

This plant community developed with continuous grazing without adequate recovery periods during the growing season. The dominant grass is blue grama. Little bluestem and sideoats grama are still present as secondary grasses in the community. Big bluestem, Indiangrass, switchgrass, prairie sandreed, needleandthread, western wheatgrass, purple prairie clover and winterfat have been significantly reduced. Hairy grama, sand dropseed, red threeawn as well as Hoods phlox, hairy goldaster, western ragweed and slimflower scurfpea have increased. Woody plants include small soapweed and skunkbush sumac.

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 are common. Desertification is in an early stage.

Total annual production, during an average year, ranges from 300 to 800 pounds of air-dry weight and will average 500 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: CO6709
Growth curve name: Warm season dominant, cool season sub-dominant; MLRA-67B; upland coarse textured soils.

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
0	0	2	7	25	35	15	10	5	1	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 Sod, Threadleaf Sedge Plant Community*. Weedy species are starting to invade and almost all mid grasses are removed.
- Prescribed grazing which allows for adequate recovery periods following each grazing event and proper stocking will move this plant community toward the *Little Bluestem, Sideoats Grama, Plant Community (HCPC)*.
- Long term non-use (rest) and no fire will shift this plant community across an ecological threshold toward the *Bare Ground, Annuals, Cryptogams Plant Community.* This transition may take 40 years or more to achieve.

Blue Grama Sod, Threadleaf Sedge Plant Community

This plant community developed with continued grazing without adequate recovery periods between grazing events. Blue grama and threadleaf sedge dominate the community. These species exhibit a mosaic sodbound appearance. Tall grasses have been removed. Little bluestem and sideoats grama may remain in remnant amounts on steeper slopes. Forbs and shrubs that have increased are wormwood, western ragweed, Hood's phlox, hairy goldaster, fringed sagebrush and small soapweed. Cushion plants such as mat loco and sessile nailwort have increased.

Species diversity and production have been severely reduced. Litter levels are very low. Mineral and water cycles are impaired due to the loss of deeper-rooted grasses, forbs and shrubs. Rills are evident and soil loss is obvious, especially on steeper slopes. Pedestalled plants with exposed roots are common. Desertification is advanced.

Production ranges from 150 to 450 pounds of air-dry vegetation per acre per year and averages 300 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: CO6712
Growth curve name: Warm season/cool season co-dominant; MLRA-67B; upland coarse textured soils.

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
0	0	0	1	7	48	27	15	2	0	0	0

(monthly percentages of total annual growth)

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

- Heavy continuous grazing or excessive defoliation without adequate recovery periods following each grazing event will shift this plant community across an ecological threshold toward the *Bare Ground, Cryptogams, Annuals Plant Community*. Soil erosion is a major concern.
- Long term prescribed grazing with adequate recovery periods between grazing events will move this plant community toward the *Blue Grama with Decreased Mid and Tall Grass Plant Community* and eventually toward the *HCPC*, assuming an adequate seed source and/or remnant plants are available. This transition may take upwards of 40 years or more to achieve.

Bare Ground, Cryptogams, Annuals Plant Community

This plant community is caused by heavy continuous grazing and/or excessive defoliation without adequate recovery opportunity given during the growing season. Bare ground, cushion plants and cryptogamic crusts have significantly increased. Remnant amounts of blue and/or hairy grama may still be found. Other plants which may be present are Russian thistle, kochia, red threeawn, cheatgrass, cushion plants (mat loco, sessile nailwort, Hoods phlox) 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-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: CO6710
Growth curve name: Warm season dominant; MLRA-67B; upland coarse textured soils.

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
0	0	0	5	20	40	20	10	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 will move this plant community toward the *Blue Grama Sod, Threadleaf Sedge 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

Little Bluestem, Sideoats 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 and Tall Grass 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 Sod, Threadleaf Sedge 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†)

Common Name	Cattle				Sheep				Horses				Deer				Antelope				Bison				Elk			
Grasses and Grass-likes																												
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
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
prairie sandreed	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
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
ring muhly	N	N	N	N	U	U	U	U	N	N	N	N	U	U	U	U	U	U	U	U	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
sixweeks fescue	N	D	N	N	N	D	N	N	N	D	N	N	N	D	N	N	N	D	N	N	N	D	N	N	N	D	N	N
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
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
Forbs																												
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
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
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
heath aster	U	U	D	U	U	U	P	U	U	U	D	U	U	U	P	U	U	U	P	U	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
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 scurfpea	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
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
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 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
Shrubs																												
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
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
plains pricklypear	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
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
spreading eriogonum	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
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
† 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)
Little Bluestem, Sideoats Grama (HCPC)	950	0.30
Blue Grama with Decreased Mid/Tall Grass	500	0.16
Blue Grama Sod, Threadleaf Sedge	300	0.10
Annuals, Cryptogams, 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 A and B. Infiltration varies from moderate to high and runoff potential for this site varies from moderate to low 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

This site is a source for gravel.

Supporting Information

Associated Sites

(R067BY002CO) – Loamy (formerly Loamy Plains)
(R067BY008CO) – Loamy Slopes
(R067BY056CO) – Sandstone Breaks
(R067BY052CO) – Loess Breaks
(R067BY042CO) – Clayey (formerly Clayey Plains)
(R067BY045CO) – Shaly Plains
(R067BY039CO) – Shallow Siltstone
(R067BY009CO) – Siltstone Plains

Similar Sites

(R067BY056CO) – Sandstone Breaks
[highly production, sandstone outcrop]
(R067BY060CO) – Limestone Breaks
[highly calcareous soil, lack of gravel]

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, Brighton, Burlington, Byers, Cheyenne Wells, Eads, Flagler, Fort Collins, Fort Morgan, Greeley, Holly, Hugo, Kiowa, Lakewood (metro), Lamar, Longmont, Simla, Springfield, 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)

USDA, NRCS. National Range and Pasture Handbook, September 1997

USDA, NRCS. National Soil Information System, Information Technology Center, 2150 Centre Avenue, Building A, Fort Collins, CO 80526. (http://nasis.nrcs.usda.gov)

USDA, NRCS. 2004. The PLANTS Database, Version 3.1 (http://plants.usda.gov). National Plant Data Center, Baton Rouge, LA 70874-4490 USA.

Andrews, R. and R. Righter. 1992. Colorado Birds. Denver Museum Nat. Hist., Denver, CO. 442 pp.

Armstrong, D.M. 1972. Distribution of mammals in Colorado. Univ. Kansas Museum Nat. Hist. Monograph #3. 415 pp.

Colorado Breeding Bird Atlas. 1998. Hugh Kingery, Ed., Dist. CO Wildlife Heritage Found., P.O. Box 211512, Denver, CO, 80221. 636 pp.

Fitzgerald, J.P., C.A. Meaney, and D.M. Armstrong. 1994. Mammals of Colorado. Denver Museum Nat. Hist. Denver, CO. 467 pp.

Hammerson, G.A. 1986. Amphibians and reptiles in Colorado. CO Div. Wild. Publication Code DOW-M-I-3-86. 131 pp.

Rennicke, J. 1990. Colorado Wildlife. Falcon Press, Helena and Billings, MT and CO Div. Wildlife, Denver CO. 138 pp.

Site Description Approval

/s/ 03/25/2004

State Range Management Specialist Date