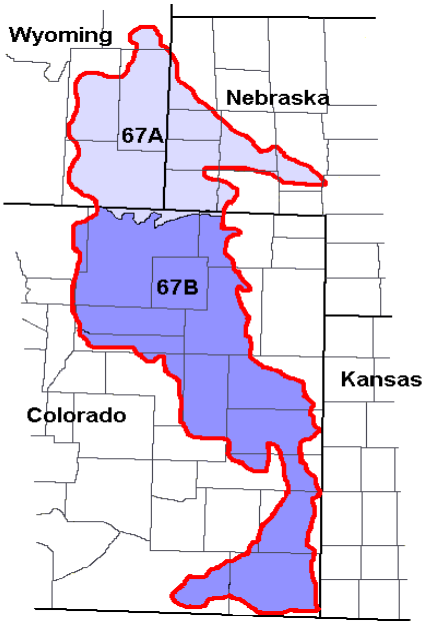
United States Department of Agriculture
Natural Resources Conservation Service

Ecological Site Description



Site Type: Rangeland

Site Name: Siltstone Plains

Site ID: R067BY009CO

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

Physiographic Features

This site occurs on nearly level to moderately sloping plains.

Landform: flats, ridges

Aspect: N/A

	Minimum	Maximum
Elevation (feet):	3800	5600
Slope (percent):	0	6
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:	negligible	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.

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 moderately deep to very deep, well drained, and moderately permeable. These soils occur on flats and ridges. Some soils have bedrock at depths of 20 to 80 inches. The available water capacity is typically low to high. The soil surface layer is typically 3 to 12 inches thick and should show slight to no evidence of rills, wind scoured areas or pedestaled plants. Water flow paths, if any, are broken, irregular in appearance or discontinuous with numerous debris dams or vegetative barriers. The soil surface is stable and intact. Sub-surface soil layers are non-restrictive to water movement and root penetration.

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

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

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

Subsurface Texture Group: loamy
Surface Fragments ≤ 3" (% Cover): 0
Surface Fragments > 3" (%Cover): 0
Subsurface Fragments ≤ 3" (% Volume): 0 - 10
Subsurface Fragments > 3" (% Volume): 0

	Minimum	Maximum
Drainage Class:	well	well
Permeability Class:	moderate	moderate
Depth (inches):	20	80
Electrical Conductivity (mmhos/cm)*:	0	2
Sodium Absorption Ratio*:	0	0
Soil Reaction (1:1 Water)*:	7.4	8.4
Available Water Capacity (inches)*:	3.5	10.5
Calcium Carbonate Equivalent (percent)*:	0	15

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

Plant Communities

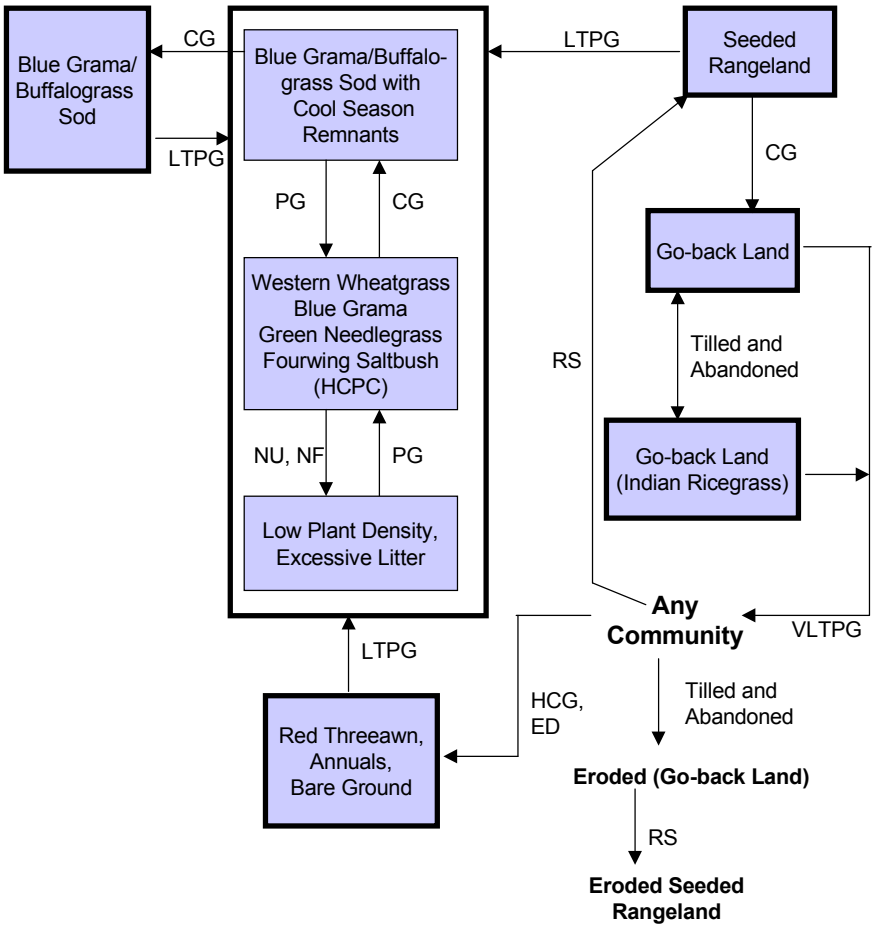
Ecological Dynamics of the Site:

Deterioration of this site, due to continuous grazing without adequate recovery periods following each grazing occurrence, will cause blue grama and buffalograss to increase. Cool season grasses such as green needlegrass and western wheatgrass will decrease in frequency and production as well as key shrubs such as fourwing saltbush and winterfat. American vetch and other highly palatable forbs will decrease also. Continuous grazing will eventually cause a buffalograss/blue grama sod to develop. Red threeawn, annuals and bare ground will increase with long term continuous grazing. Plant density will eventually decrease due to non-use (rest) and lack of fire. Much of this ecological site has been tilled and used for crop production.

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, **LTCG** - long term continuous grazing (>40 yrs), **LTPG** - long term prescribed grazing (>40 yrs), **NF** - no fire, **NU** - non-use, **PG** - prescribed grazing with adequate recovery period, **RS** - range seeding, **VLTPG** - very long term prescribed grazing (>80 yrs)

Plant Community Composition and Group Annual Production

			Western Wheatgrass, Blue Grama, Green Needlegrass, Fourwing Saltbush (HCPC)		
COMMON/GROUP NAME	**SCIENTIFIC NAME**	**SYMBOL**	**Group**	**lbs./acre**	**% Comp**
GRASSES & GRASS-LIKES			*1*	*840 - 1020*	*70 - 85*
western wheatgrass	Pascopyrum smithii	PASM	1	300 - 420	25 - 35
blue grama	Bouteloua gracilis	BOGR2	1	300 - 360	25 - 30
green needlegrass	Nassella viridula	NAVI4	1	180 - 240	15 - 20
buffalograss	Buchloe dactyloides	BUDA	1	12 - 60	1 - 5
needleandthread	Hesperostipa comata ssp. comata	HECOC8	1	12 - 24	1 - 2
sand dropseed	Sporobolus cryptandrus	SPCR	1	12 - 24	1 - 2
bottlebrush squirreltail	Elymus elymoides ssp. elymoides	ELELE	1	0 - 12	0 - 1
Indian ricegrass	Achnatherum hymenoides	ACHY	1	0 - 12	0 - 1
little bluestem	Schizachyrium scoparium	SCSC	1	0 - 12	0 - 1
prairie junegrass	Koeleria macrantha	KOMA	1	0 - 12	0 - 1
ring muhly	Muhlenbergia torreyi	MUTO2	1	0 - 12	0 - 1
sideoats grama	Bouteloua curtipendula	BOCU	1	0 - 12	0 - 1
sixweeks fescue	Vulpia octoflora	VUOC	1	0 - 12	0 - 1
tumblegrass	Schedonnardus paniculatus	SCPA	1	0 - 12	0 - 1
sun sedge	Carex inops ssp. heliophila	CAINH2	1	12 - 36	1 - 3
needleleaf sedge	Carex duriuscula	CADU6	1	0 - 12	0 - 1
other perennial grasses		2GP	1	12 - 60	1 - 5
FORBS			*2*	*60 - 180*	*5 - 15*
American vetch	Vicia americana	VIAM	2	12 - 60	1 - 5
ironplant goldenweed	Machaeranthera pinnatifida ssp. pinnatifida var. pinnatifida	MAPIP4	2	12 - 24	1 - 2
purple prairie clover	Dalea purpurea	DAPU5	2	12 - 24	1 - 2
scarlet globemallow	Sphaeralcea coccinea	SPCO	2	12 - 24	1 - 2
bigflower townsendia	Townsendia grandiflora	TOGR	2	0 - 12	0 - 1
cutleaf evening-primrose	Oenothera coronopifolia	OECO2	2	0 - 12	0 - 1
dotted gayfeather	Liatris punctata	LIPU	2	0 - 12	0 - 1
fernleaf biscuitroot	Lomatium dissectum	LODI	2	0 - 12	0 - 1
hairy goldaster	Heterotheca villosa	HEVI4	2	0 - 12	0 - 1
heath aster	Symphyotrichum ericoides	SYER	2	0 - 12	0 - 1
Lambert crazyweed	Oxytropis lambertii	OXLA3	2	0 - 12	0 - 1
narrowleaf penstemon	Penstemon angustifolius	PEAN4	2	0 - 12	0 - 1
narrowleaf poisonvetch	Astragalus pectinatus	ASPE5	2	0 - 12	0 - 1
rush skeletonplant	Lygodesmia juncea	LYJU	2	0 - 12	0 - 1
silky crazyweed	Oxytropis sericea	OXSE	2	0 - 12	0 - 1
slimflower scurfpea	Psoralidium tenuiflorum	PSTE5	2	0 - 12	0 - 1
textile onion	Allium textile	ALTE	2	0 - 12	0 - 1
threadleaf groundsel	Senecio flaccidus var. flaccidus	SEFLF	2	0 - 12	0 - 1
twogrooved milkvetch	Astragalus bisulcatus	ASBI2	2	0 - 12	0 - 1
upright prairie coneflower	Ratibida columnifera	RACO3	2	0 - 12	0 - 1
variable senecio	Packera neomexicana var. mutabilis	PANEM	2	0 - 12	0 - 1
wavyleaf thistle	Cirsium undulatum	CIUN	2	0 - 12	0 - 1
western ragweed	Ambrosia psilostachya	AMPS	2	0 - 12	0 - 1
woolly Indianwheat	Plantago patagonica	PLPA2	2	0 - 12	0 - 1
woolly locoweed	Astragalus mollissimus	ASMO7	2	0 - 12	0 - 1
wormwood	Artemisia dracunculus	ARDR4	2	0 - 12	0 - 1
other perennial forbs		2FP	2	12 - 60	1 - 5
SHRUBS			*3*	*120 - 180*	*10 - 15*
fourwing saltbush	Atriplex canescens	ATCA2	3	120 - 180	10 - 15
winterfat	Krascheninnikovia lanata	KRLA2	3	24 - 84	2 - 7
broom snakeweed	Gutierrezia sarothrae	GUSA2	3	0 - 12	0 - 1
fringed sagebrush	Artemisia frigida	ARFR4	3	0 - 12	0 - 1
purple pincushion	Escobaria vivipara var. vivipara	ESVIV	3	0 - 12	0 - 1
rubber rabbitbrush	Ericameria nauseosa ssp. nauseosa var. nauseosa	ERNAN5	3	0 - 12	0 - 1
small soapweed	Yucca glauca	YUGL	3	0 - 12	0 - 1
spreading buckwheat	Eriogonum effusum	EREF	3	0 - 12	0 - 1
other shrubs		2SHRUB	3	12 - 36	1 - 3

Annual Production lbs./acre	LOW	RV*	HIGH
GRASSES & GRASS-LIKES	330 -	940	- 1330
FORBS	55 -	120	- 185
SHRUBS	115 -	140	- 185
TOTAL	500 -	1200	- 1700

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.

Western Wheatgrass, Blue Grama, Green Needlegrass, Fourwing Saltbush Plant Community

This is the interpretive plant community and is considered to be the Historic Climax Plant Community (HCPC). This plant community evolved with grazing by large herbivores and is well suited for grazing by domestic livestock and can be found on areas that are properly managed with prescribed grazing that allows for adequate recovery periods following each grazing event. The potential vegetation is about 70-85% grasses and grass-like plants, 5-15% forbs and 10-15% woody plants.

The major grasses include western wheatgrass, green needlegrass and blue grama. Sub-dominant grasses include buffalograss, needleandthread, Indian ricegrass and little bluestem. Major forbs and shrubs include American vetch, scarlet globemallow, dotted gayfeather, upright prairie coneflower, fourwing saltbush and winterfat.

This plant community is diverse, stable, and productive. Litter is properly distributed with little movement and natural plant mortality is very low. It is well suited to carbon sequestration, water yield, wildlife use by many species, livestock use and is esthetically pleasing. 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.

Total annual production ranges from 500 to 1700 pounds of air-dry vegetation per acre and will average 1200 pounds during an average 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: CO6701
Growth curve name: Cool season/warm 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	28	15	12	10	5	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/Buffalograss Sod with Cool Season Remnants Plant Community.*
- Non-use (rest) and lack of fire will move this plant community to the *Low Plant Density, Excessive Litter Plant Community.*
- Prescribed grazing that allows for adequate recovery opportunity following each grazing event and proper stocking will maintain the *Western Wheatgrass, Blue Grama, Green Needlegrass, Fourwing Saltbush Plant Community (HCPC)*.

Blue Grama/Buffalograss Sod with Cool Season Remnants Plant Community

This plant community evolved with continuous grazing without adequate recovery periods between each grazing event during the growing season. Recognition of this plant community will enable the land user to implement key management decisions before a significant economic/ecological threshold is crossed.

Key species such as green needlegrass, western wheatgrass, American vetch, fourwing saltbush and winterfat have been reduced to remnant amounts. Blue grama and buffalograss have increased in abundance, dominate the community, and are beginning to take on a sod appearance. Sand dropseed, red threeawn, sixweeks fescue, bottlebrush squirreltail and hairy goldaster have also increased. This plant community is at risk of losing green needlegrass, western wheatgrass, American vetch, fourwing saltbush and winterfat . Once these key species are completely removed and other plants have increased, it will take a long time to bring them back by management alone. Substantial increases in money and other resources will be required to replace the lost species in a shorter period of time.

Total aboveground carbon has been reduced due to decreases in forage and litter production. Loss of rhizomatous wheatgrass, nitrogen fixing forbs, shrub component and increased warm season short grasses has begun to alter the biotic integrity of this community. Water and nutrient cycles are becoming impaired. Desertification has begun.

Total annual production can vary from 200 to 1100 pounds of air-dry vegetation per acre and will average 800 pounds during an average 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: 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 periods between grazing events shifts this plant community across an ecological threshold to the *Blue Grama/Buffalograss Sod Plant Community.*
- Prescribed grazing with adequate recovery periods after each grazing occurrence during the growing season with a proper stocking rate will return the plant community back to the *Western Wheatgrass, Blue Grama, Green Needlegrass, Fourwing Saltbush Plant Community (HCPC)*.

Low Plant Density, Excessive Litter Plant Community

This plant community occurs when grazing is removed for long periods of time (rest) in the absence of fire. Plant composition is similar to the HCPC, however individual species production and frequency will be lower. Fringed sagebrush has increased.

Much of the nutrients are tied up in excess litter. The semiarid environment and the absence of animal traffic to break down litter slow nutrient recycling. Aboveground litter also limits sunlight from reaching plant crowns. Many plants, especially bunchgrasses die off. Thick litter and absence of grazing (rest) or fire reduce seed germination and establishment.

In advanced stages, plant mortality can increase and erosion may eventually occur if bare ground increases. Once this happens it will require increased energy input in terms of practice cost and management to bring back.

Total annual production can vary from 300 to 1300 pounds of air-dry vegetation per acre and will average 850 pounds during an average 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: CO6703
Growth curve name: Cool season/warm season co-dominant, excess litter; MLRA-67B; upland fine textured soils.

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
0	0	0	10	20	25	15	15	10	5	0	0

(monthly percentages of total annual growth)

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

- Prescribed grazing with adequate recovery periods between each grazing event and proper stocking can restore this plant community back to the *Western Wheatgrass, Blue Grama, Green Needlegrass, Fourwing Saltbush Plant Community (HCPC)*.

Blue Grama/Buffalograss Sod Plant Community

This plant community evolved with continuous grazing and occurs frequently throughout most of the eastern plains of Colorado. Most of the key grass, forb and shrub species are absent. Western wheatgrass may persist in trace amounts, greatly reduced in vigor and not readily seen. Blue grama and buffalograss dominate the community with a tight "sodbound" appearance. Red threeawn, sand dropseed, sixweeks fescue and hairy goldaster have increased.

This plant community is resistant to change due to grazing tolerance of buffalograss and blue grama. A significant amount of production and diversity has been lost from this community when compared to the HCPC. Loss or major reduction of cool season grasses, shrub component and nitrogen fixing forbs have negatively impacted energy flow and nutrient cycling. Water infiltration is reduced significantly due to the massive shallow root system "root pan", characteristic of blue grama and buffalograss. Soil loss may be obvious where flow paths are connected.

It will take a very long time to restore this plant community back to the HCPC with management. Renovation would be very costly. Desertification is advanced.

Production ranges from 100 to 800 pounds of air-dry vegetation per acre per year and averages 600 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:

- Heavy continuous grazing or excessive defoliation without adequate recovery periods following each grazing event will shift this plant community toward the *Red threeawn, Annuals, Bare Ground Plant Community.* This transition may take greater than 40 years. Erosion and loss of organic matter/carbon reserves are concerns.
- Long term prescribed grazing with adequate recovery periods following each grazing event and proper stocking over long periods of time move this plant community toward the *Blue Grama/Buffalograss Sod with Cool Season Remnants Plant Community* and will eventually return to the *HCPC* or associated successional plant community stages assuming an adequate seed/vegetative source is available. This process may take greater than 40 years.

Red Threeawn, Annuals, Bare Ground Plant Community

This plant community develops with heavy continuous grazing and/or occupation by prairie dogs. Red threeawn is the dominant species. Blue grama may persist in localized areas. Introduced annuals such as kochia and Russian thistle are present. Introduced species such as field bindweed can also be present, especially on prairie dog towns.

Litter levels are extremely low. Erosion is evident where flow paths are continuous. Rills may occur on steeper slopes. Wind scoured areas may be apparent on knolls or unprotected areas. The nutrient cycle, water cycle and overall energy flow are greatly impaired. Organic matter/carbon reserves are greatly reduced. Desertification is obvious.

Total annual production can vary from 50 to 200 pounds of air-dry vegetation per acre and will average 100 pounds during an average 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: 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 with adequate recovery periods between each grazing event and proper stocking can eventually move this community back to the *Historic Climax Plant Community* or associated successional plant community stages, but it will take a long time (40 to 80 years or more).
- Range seeding followed by prescribed grazing may be used as an alternative to convert this plant community to a *Seeded Rangeland* community, which can closely resemble the *HCPC* however, at a substantial cost.

Go-back Land

Go-back land is created when the soil is tilled or farmed (sodbusted) and abandoned. All of the native plants are destroyed, soil organic mater is reduced, soil structure is changed and a plowpan or compacted layer is formed. Residual synthetic chemicals often remain from past farming operations and erosion processes are active.

Go-back land evolves through several plant communities beginning with an early annual plant community, which initiates the revegetation process. Plants such as Russian thistle, kochia and other annuals begin to establish. These plants give some protection from erosion and start to build minor levels of soil organic matter. This early annual plant community lasts for two to several years. Red threeawn, sand dropseed and several other early perennials can dominate the plant community for five to eight years or more. Buffalograss establishes next and dominates for many years. Eventually western wheatgrass, blue grama and other natives become reestablished.

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

- Very long term prescribed grazing that allows adequate recovery periods following each grazing event and proper stocking will most likely take this plant community to a buffalograss dominated plant community and eventually back to the *HCPC* assuming an adequate seed/vegetative source is available. This process takes many years (40-80 years or more).
- Range seeding followed with prescribed grazing can be used to convert *Go-back Land* to a *Seeded Rangeland Plant Community* which can eventually resemble the *HCPC.*

Go-back Land (Indian Ricegrass)

In some instances, when this soil is tilled and abandoned, secondary succession leads to an Indian ricegrass dominated plant community.

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

- Very long term prescribed grazing that allows adequate recovery periods following each grazing event and proper stocking will most likely take this plant community to a buffalograss dominated plant community and eventually back to the *HCPC* assuming an adequate seed/vegetative source is available. This process takes many years (40-80 years or more).

Go-back Land (eroded)

Eroded go-back land is created where tillage or farming and severe erosion has occurred. If the parent material that the original soil developed from is lost, then another ecosite will evolve. If the same parent material is present, then re-seeding or the slow process of developing soil and vegetation will start by similar processes as shown in the non-eroded *Go-back Land* above. This is a very slow process (100 years or more).

Seeded Rangeland

This plant community can vary considerably depending on how eroded the soil was, the species seeded, the stand that was established, how long ago the stand was established and the management of the stand since establishment.

- Continuous grazing without adequate recovery period between grazing events can shift this plant community to a plant community resembling *Go-back Land.*
- Long term prescribed grazing that provides adequate recovery opportunity following each grazing event will eventually move this plant community toward the *HCPC* or associated successional plant community stages.

Ecological Site Interpretations

Animal Community – Wildlife Interpretations

Western Wheatgrass, Blue Grama, Green Needlegrass, Fourwing Saltbush Plant Community
The structural diversity in the plant community found on the HCPC is attractive to a number of wildlife species. Common bird species expected on the HCPC include Cassin's sparrow, chestnut collared longspur, lark bunting, western meadowlark, and ferruginous and Swainson's hawks. Although they would be expected more in MLRA 72, the combination of mid-tall grasses and shrubs provides habitat for greater and lesser prairie chicken in the easternmost parts of this site. Scaled quail are expected to use this site.
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 western hognose snake, racer, western box turtle, and six-lined racerunner.

Blue Grama/Buffalograss Sod with Cool Season Remnants 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.

Low Plant Density, Excessive Litter Plant Community
Both the HCPC species and shortgrass prairie species such as burrowing owl, mountain plover, horned lark, McCown's longspur, kildeer, and long-billed curlew use this plant community, however conditions are shifting away from HCPC species preferences and toward shortgrass prairie species. Jackrabbit, black-tailed prairie dog, thirteen-lined ground squirrel, and desert cottontail rabbit are frequent users of this community. All other mammal species from the HCPC may use the community. Reptiles using this community include the species listed for the HCPC.

Blue Grama/Buffalograss Sod Plant Community; Red Threeawn, Annuals, Bare Ground Plant Community; Go-back Land Plant Community
Conditions in these plant communities favor the shortgrass species listed in the Low Density, Excessive Litter community. Most HCPC bird species other than the hawks would not be expected here. 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.

Seeded Rangeland
The wildlife species expected on seeded rangeland would be those listed for the plant community the seeding most resembles.

Other Potential Species
The plains spadefoot toad is commonly found in 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																												
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
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
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
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
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
tumblegrass	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
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
needleleaf 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
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
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
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
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
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
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
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
textile onion	U	D	U	U	U	D	D	U	U	D	U	U	U	D	D	U	U	D	D	U	U	D	U	U	U	D	U	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
variable senecio	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
wavyleaf thistle	U	U	D	U	U	D	D	U	U	U	D	U	U	D	D	U	U	D	D	U	U	U	D	U	U	U	D	U
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
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																												
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
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
purple pincushion	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
rubber rabbitbrush	N	N	N	D	D	D	D	D	N	N	N	D	D	D	D	D	D	D	D	D	N	N	N	D	N	N	N	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 buckwheat	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)
Western Wheatgrass, Blue Grama, Green Needlegrass, Fourwing (HCPC)	1200	0.38
Blue Grama/Buffalograss Sod w/Remnant Cool Seasons	800	0.26
Blue Grama/Buffalograss Sod	600	0.19
Low Plant Density, Excessive Litter	850	*
Red Threeawn, Annuals, Bare Ground	100	*

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 varies from moderate to high depending on ground cover. In many cases, areas with greater than 75% ground cover have the greatest potential for high infiltration and lower runoff. An example of an exception would be where shortgrasses form a strong sod and dominate the site. 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

(067BY002CO) – Loamy (formerly Loamy Plains)
(067BY008CO) – Loamy Slopes
(067BY036CO) – Overflow

Similar Sites

(067BY002CO) – Loamy (formerly Loamy Plains)
[greater abundance of plains prickleypear cactus, slightly more productive]

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, 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)

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Site Description Approval

/s/ 03/25/2004

State Range Management Specialist Date