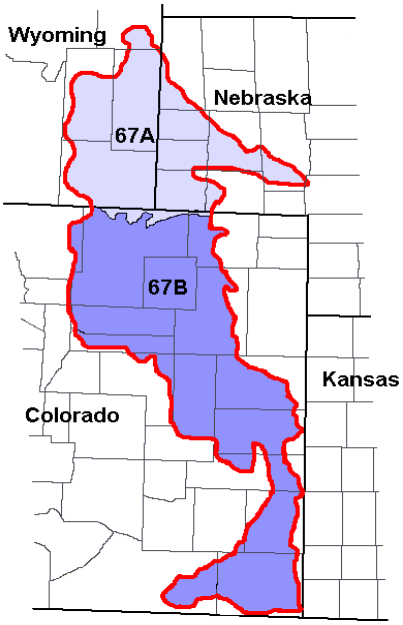
United States Department of Agriculture
Natural Resources Conservation Service

Ecological Site Description



Site Type: Rangeland

Site Name: Loamy Slopes

Site ID: R067BY008CO

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

Physiographic Features

This site occurs on gently sloping to steep slopes.

Landform: hills

Aspect: N/A

	Minimum	Maximum
Elevation (feet):	3800	5600
Slope (percent):	6	25
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:	medium	very high

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 dominantly very deep but may also include some moderately deep soils. These soils are well drained, and slowly to moderately permeable and occur on hills formed in loess, eolian deposits, and alluvium derived from mixed sources. The available water capacity is high for the very deep soils and moderate for the moderately deep soils. The soil surface layer is typically 2 to 7 inches thick and is typically loam, silt loam or clay loam. The pH of these soils range from neutral to strongly alkaline. The soil moisture regime is typically aridic ustic with some ustic aridic in the drier areas. The soil temperature regime is mesic. These soils are susceptible to rill and gully erosion.

The Historic Climax Plant Community (HCPC) should exhibit broken flow paths, irregular in appearance or discontinuous with numerous debris dams or vegetative barriers and exhibit slight to no evidence of rills or pedestaled plants where slopes are gentle. The soil surface is stable and intact. Sub-surface soil layers are non-restrictive to water movement and root penetration.

The hazard of water erosion increases on slopes greater than about 15 percent. Some flow paths, rills and pedestaled plants may be evident on these slopes. Cat-steps or terracettes on steeper slopes may be present.

Major soil series correlated to this ecological site include: Adena, Baca, Buick, Colby, Kimst, Norka, Stoneham, and Thedalund.

Other soil series that have been correlated to this site include: Bainville and Bresser.

Parent Material Kind: loess, eolian deposits, alluvium
Parent Material Origin: mixed
Surface Texture: loam, silt loam, clay 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:	slow	moderate
Depth (inches):	40	80
Electrical Conductivity (mmhos/cm)*:	0	2
Sodium Absorption Ratio*:	0	0
Soil Reaction (1:1 Water)*:	6.6	9.0
Available Water Capacity (inches)*:	6	8
Calcium Carbonate Equivalent (percent)*:	0	15

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

Plant Communities

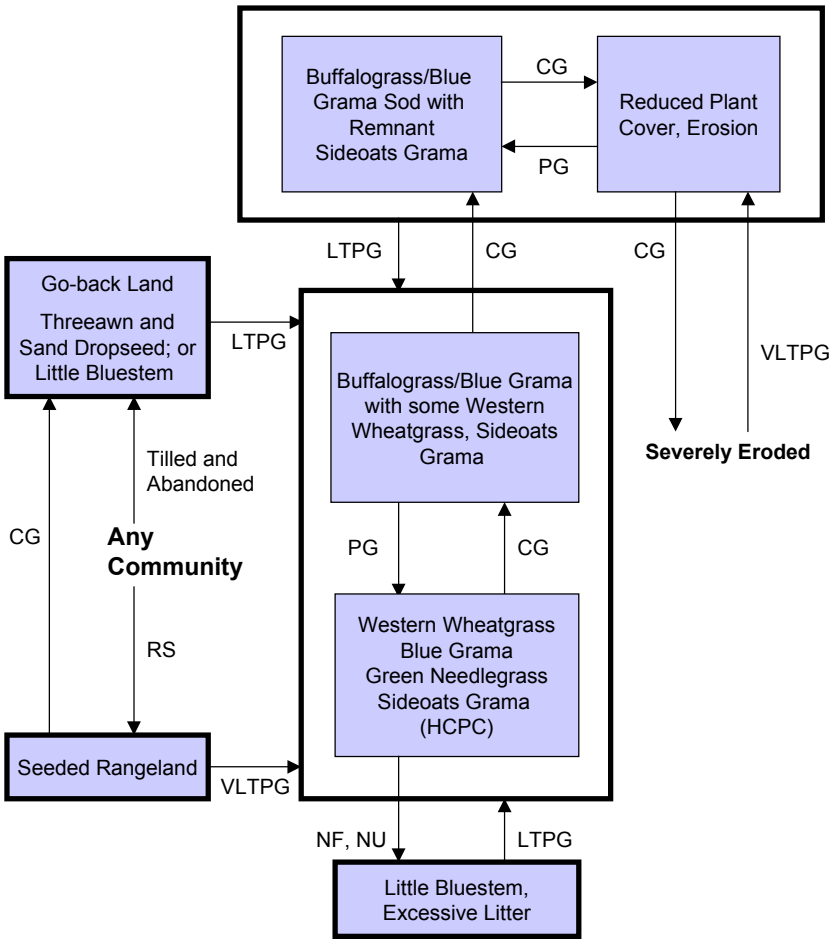
Ecological Dynamics of the Site:

As this site deteriorates from continuous grazing without adequate recovery periods following each grazing occurrence species such as blue grama and buffalograss will increase and eventually form a sod. Green needlegrass, western wheatgrass, big bluestem and switchgrass will decrease in frequency and production as well as key shrubs such as fourwing saltbush and winterfat. American vetch, a highly palatable forb, will decrease also. Eventually, plant communities can regress to the point where plant cover is substantially reduced and erosion is active. Any plant community subjected to long periods of non-use or rest, in the absence of fire, will result in excessive litter levels and increased little bluestem.

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 period, **HCPC** - Historic Climax Plant Community, **LTCG** - long term continuous grazing (>40 years), **LTPG** – long term prescribed grazing (> 40 years), **NF** – no fire, **NU** – non-use, **PG** – prescribed grazing with adequate recovery period, **RS -** range seeding, **VLTPG** - very long term prescribed grazing (>80 years)

Plant Community Composition and Group Annual Production

			Western Wheatgrass, Blue Grama, Green Needlegrass, Sideoats Grama (HCPC)		
COMMON/GROUP NAME	**SCIENTIFIC NAME**	**SYMBOL**	**Group**	**lbs./acre**	**% Comp**
GRASSES & GRASS-LIKES			*1*	*750 - 900*	*75 - 90*
western wheatgrass	Pascopyrum smithii	PASM	1	300 - 400	30 - 40
blue grama	Bouteloua gracilis	BOGR2	1	200 - 300	20 - 30
green needlegrass	Nassella viridula	NAVI4	1	150 - 200	15 - 20
sideoats grama	Bouteloua curtipendula	BOCU	1	50 - 150	5 - 15
little bluestem	Schizachyrium scoparium	SCSC	1	10 - 50	1 - 5
needleandthread	Hesperostipa comata ssp. comata	HECOC8	1	10 - 50	1 - 5
big bluestem	Andropogon gerardii	ANGE	1	10 - 30	1 - 3
buffalograss	Buchloe dactyloides	BUDA	1	10 - 30	1 - 3
switchgrass	Panicum virgatum	PAVI2	1	10 - 30	1 - 3
bottlebrush squirreltail	Elymus elymoides ssp. elymoides	ELELE	1	0 - 10	0 - 1
Indian ricegrass	Achnatherum hymenoides	ACHY	1	0 - 10	0 - 1
prairie junegrass	Koeleria macrantha	KOMA	1	0 - 10	0 - 1
red threeawn	Aristida purpurea var. longiseta	ARPUL	1	0 - 10	0 - 1
ring muhly	Muhlenbergia torreyi	MUTO2	1	0 - 10	0 - 1
sand dropseed	Sporobolus cryptandrus	SPCR	1	0 - 10	0 - 1
threadleaf sedge	Carex filifolia	CAFI	1	10 - 30	1 - 3
sun sedge	Carex inops ssp. heliophila	CAINH2	1	0 - 20	0 - 2
other native grasses		2GP	1	10 - 50	1 - 5
FORBS			*2*	*50 - 100*	*5 - 10*
American vetch	Vicia americana	VIAM	2	10 - 50	1 - 5
scarlet globemallow	Sphaeralcea coccinea	SPCO	2	10 - 20	1 - 2
purple prairieclover	Dalea purpurea var. purpurea	DAPUP	2	10 - 20	1 - 2
Colorado greenthread	Thelesperma filifolium	THFI	2	0 - 10	0 - 1
cutleaf eveningprimrose	Oenothera coronopifolia	OECO2	2	0 - 10	0 - 1
dotted gayfeather	Liatris punctata	LIPU	2	0 - 10	0 - 1
hairy goldaster	Heterotheca villosa	HEVI4	2	0 - 10	0 - 1
ironplant goldenweed	Machaeranthera pinnatifida ssp. pinnatifida	MAPIP4	2	0 - 10	0 - 1
Lambert crazyweed	Oxytropis lambertii	OXLA3	2	0 - 10	0 - 1
narrowleaf penstemon	Penstemon angustifolius	PEAN4	2	0 - 10	0 - 1
narrowleaf poisonvetch	Astragalus pectinatus	ASPE5	2	0 - 10	0 - 1
rush skeletonplant	Lygodesmia juncea	LYJU	2	0 - 10	0 - 1
silky crazyweed	Oxytropis sericea	OXSE	2	0 - 10	0 - 1
silverleaf scurfpea	Pediomelum argophyllum	PEAR6	2	0 - 10	0 - 1
slimflower scurfpea	Psoralidium tenuiflorum	PSTE5	2	0 - 10	0 - 1
stiff sunflower	Helianthus pauciflorus ssp. pauciflorus	HEPAP2	2	0 - 10	0 - 1
twogrooved milkvetch	Astragalus bisulcatus	ASBI2	2	0 - 10	0 - 1
upright prairie coneflower	Ratibida columnifera	RACO3	2	0 - 10	0 - 1
variable senecio	Packera neomexicana var. mutabilis	PANEM	2	0 - 10	0 - 1
western ragweed	Ambrosia psilostachya	AMPS	2	0 - 10	0 - 1
woolly Indianwheat	Plantago patagonica	PLPA2	2	0 - 10	0 - 1
woolly locoweed	Astragalus mollissimus	ASMO7	2	0 - 10	0 - 1
wormwood	Artemisia dracunculus	ARDR4	2	0 - 10	0 - 1
other native forbs		2FP	2	10 - 30	1 - 3
SHRUBS			*3*	*50 - 150*	*5 - 15*
fourwing saltbush	Atriplex canescens	ATCA2	3	20 - 80	2 - 8
winterfat	Krascheninnikovia lanata	KRLA2	3	20 - 70	2 - 7
Arkansas rose	Rosa arkansana	ROAR3	3	10 - 30	1 - 3
broom snakeweed	Gutierrezia sarothrae	GUSA2	3	0 - 10	0 - 1
fringed sagebrush	Artemisia frigida	ARFR4	3	0 - 10	0 - 1
plains pricklypear	Opuntia polyacantha	OPPO	3	0 - 10	0 - 1
purple pincushion	Escobaria vivipara var. vivipara	ESVIV	3	0 - 10	0 - 1
rubber rabbitbrush	Ericameria nauseosa ssp. nauseosa	ERNAN5	3	0 - 10	0 - 1
small soapweed	Yucca glauca	YUGL	3	0 - 10	0 - 1
other native shrubs		2SHRUB	3	10 - 30	1 - 3

Annual Production lbs./acre	LOW	RV*	HIGH
GRASSES & GRASS-LIKES	410 -	825	- 1240
FORBS	45 -	75	- 105
SHRUBS	45 -	100	- 155
TREES			
TOTAL	500 -	1000	- 1500

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, Sideoats Grama Plant Community

This is the interpretive plant community and is considered to be the Historic Climax Plant Community (HCPC). This plant community and associated soils developed through the Pleistocene with large herbivores (bison, elk, deer and pronghorn). Fires likely occurred infrequently. It is well suited for domestic livestock use, wildlife use and is esthetically pleasing. This plant community can be found on areas that are properly managed with prescribed grazing that allows for adequate recovery periods following each grazing event.

This plant community consists chiefly of mid warm and cool season grasses. Principal dominants are western wheatgrass, green needlegrass, blue grama and sideoats grama. Lesser amounts of big bluestem, switchgrass and little bluestem occur. Forbs and shrubs such as purple prairieclover, American vetch, fourwing saltbush and winterfat are significant. The potential vegetation is about 75-90% grasses and grass-like plants, 5-10% forbs and 5-15% woody plants.

This community is diverse, stable and productive. Litter is properly distributed with very little movement off-site and natural plant mortality is very low. Organic matter levels are high as well as water yield. This plant community is resistant to many disturbances except continuous grazing, plowing and/or development into urban or other uses. The community can be maintained with proper stocking and prescribed grazing that allows for adequate recovery time following each grazing occurrence.

Total annual production during an average year ranges from 500 to 1500 pounds of air dry vegetation per acre per year and will average 1000 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: 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 opportunity will shift this plant community to the *Buffalograss/Blue Grama with some Western Wheatgrass and Sideoats Grama Plant Community.*
- Non-use (rest) and lack of fire will move this plant community across an ecological threshold to the *Little Bluestem and 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, Sideoats Grama Plant Community (HCPC).*

Buffalograss/Blue Grama with some Western Wheatgrass and Sideoats Grama Plant Community

This plant community developed by continuous grazing without adequate recovery periods following each grazing occurrence. Blue grama and buffalograss have increased in abundance and are the dominant species. Threadleaf and sun sedge commonly increase. Small soapweed may also increase. Western wheatgrass, green needlegrass, big bluestem, switchgrass, sideoats grama, American vetch, fourwing saltbush and winterfat have been significantly reduced in abundance, but are still present in small amounts and are at risk of being lost.

Reduction of rhizomatous wheatgrass, nitrogen fixing forbs, shrub component and increased warm season shortgrasses has begun to alter the biotic integrity of this community. Litter levels are reduced when compared to the HCPC. Nutrient cycles are becoming impaired. As buffalograss and blue grama become more dominant, water infiltration reduces and runoff can increase causing erosion of steeper slopes and off-site sedimentation.

Total annual production during an average year range from 400 to 900 pounds of air-dried pounds of vegetation per acre per year and averages 700 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 across an ecological threshold to the *Buffalograss/Blue Grama Sod with Remnant Sideoats Plant Community.*
- Prescribed grazing which allows adequate recovery periods between grazing events will move this plant community to the *Western Wheatgrass, Blue Grama, Green Needlegrass, Sideoats Grama Plant Community (HCPC).*

Buffalograss/Blue Grama Sod with Remnant Sideoats Grama Plant Community

This plant community developed under sustained continuous grazing. Buffalograss and blue grama dominate the community and have developed into a sodbound condition. Remnant amounts of sideoats remain especially on steeper slopes. Threadleaf and sun sedge have increased. Small soapweed may continue to increase. Western wheatgrass, green needlegrass, big bluestem, switchgrass, American vetch, fourwing saltbush and winterfat have been removed.

Plant diversity, plant vigor and litter levels are significantly reduced. Water cycle, nutrient cycle and energy flow has been severely impaired do to the significant changes in root structure and overall production. Infiltration due to the sod bound conditions characteristic of buffalograss and blue grama is reduced. Off site flooding and erosion are concerns.

Total annual production during an average year ranges from 350 to 800 pounds of air dry vegetation per acre per year and averages 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: 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 between grazing events will shift this plant community to the *Reduced Plant Cover, Erosion Plant Community.*
- 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 *Buffalograss/Blue Grama with some Western Wheatgrass, Sideoats Grama 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.

Reduced Plant Cover, Erosion Plant Community

This plant community develops with longer term continuous grazing. Blue grama, buffalograss, red threeawn, ring muhly and broom snakeweed are the dominant plants.

Erosion has increased. Flow paths, rills and small gullies are common. Nutrient cycle, water cycle and overall energy flow have been severely impaired. Desertification is obvious.

Total annual production during an average year ranges from 200 to 500 pounds of air dry vegetation per acre per year and averages 350 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:

- Prescribed grazing that allows adequate recovery periods between grazing events will move this plant community back to the *Buffalograss/Blue Grama Sod with Remnant Sideoats Grama Plant Community.*
- Continuous grazing without adequate recovery periods between grazing events will drive this plant community across an ecological threshold to a *Severely Eroded* condition. A different eco-site may evolve if original parent material is lost.

Little Bluestem, Excessive Litter Plant Community

This plant community develops when grazing is removed (non-use or rest) for long periods of time in the absence of fire. Little bluestem is the dominant plantand to a lesser extent, small soapweed.

Much of the nutrients are tied up in excessive 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 (little bluestem) die off. Thick litter and absence of grazing 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 greatly. An average year may range from 50 to 600 pounds of air dry vegetation per acre per year and averages 350 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: CO6704
Growth curve name: Warm season dominant, excess litter; MLRA-67B; upland fine textured soils.

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
0	0	0	1	25	45	20	7	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 (greater than 40 years) which incorporates adequate recovery periods between grazing events and proper stocking will eventually move this plant community toward the *HCPC* or associated plant communities assuming an adequate seed/vegetative source is available.

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 may be active.

An early annual plant community such as Russian thistle, kochia and other introduced annuals invade the area and initiate the revegetation process. These plants give some protection from erosion and start to rebuild some organic matter. This plant community lasts for two to several years. Red threeawn will establish and dominate the area for eight or more years. Sand dropseed will become established and then become dominant for many more years. In many instances, small soapweed begins to reestablish and can occur in significant amounts. If a seed source is available, little bluestem can become established with or without the sand dropseed. Little bluestem can dominate the community for many years. Eventually buffalograss, blue grama, western wheatgrass, sideoats grama, green needlegrass and other natives reestablish. Since soil is being developed over the years the whole successional process takes much time. The process is speeded up with prescribed grazing and proper stocking. Revegetation practices are very costly.

Production can vary from 0 to 500 pounds of air dry vegetation per acre per year depending on the soil present, the stage of secondary succession, and weather conditions.

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

- Range seeding can be used to convert the plant community to *Seeded Rangeland.* This effort will be costly.
- Long term prescribed grazing which allows adequate recovery periods between grazing events will eventually move this plant community to the *Buffalograss/Blue Grama, Western Wheatgrass and Sideoats Grama Plant Community* and eventually to the *HCPC* assuming an adequate seed/vegetative source is available. This transition can take greater than 40 years to achieve.

Seeded Rangeland

This community results from *Any Plant Community* which was tilled or degraded over time by continuous grazing and is seeded to adapted native plant species. A seed mixture of grasses, forbs and shrubs can be used to accomplish various management objectives however, revegetation is costly.

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.

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

- Continuous grazing without adequate recovery periods between grazing occurrences will cause the seeded rangeland plant community to regress and resemble a community characteristic of *Go-back Land.*
- Very long term prescribed grazing with adequate recovery periods following each grazing event and proper stocking over long periods of time will eventually move this S*eeded Rangeland* community to the *HCPC* or associated successional plant communities assuming an adequate seed/vegetative source is available. This transition may take 80 or more years to achieve.

Severely Eroded

Sustained long term continuous grazing will eventually lead to severe erosion. 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 *Go-back Land* above. This is a very slow process (100 years or more).

- Very long term prescribed grazing with adequate recovery periods following each grazing event and proper stocking over long periods of time will eventually move this community to the *HCPC* or associated successional plant communities assuming an adequate seed/vegetative source is available. The most likely transition pathway to the *HCPC* would be through the *Reduced Plant Cover, Erosion Plant Community*. This transition may take 80 or more years to achieve.

Ecological Site Interpretations

Animal Community – Wildlife Interpretations

Western Wheatgrass, Blue Grama, Green Needlegrass, Sideoats Grama Plant Community
Common bird species expected on this community 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.

Buffalograss/ Blue Grama with some Western Wheatgrass, Sideoats Grama and Yucca Plant Community
All HCPC species are expected in this plant community, however, the loss of some of the vegetative structural diversity in this plant community make it less attractive to many HCPC species.

Buffalograss/ Blue Grama Sod with Remnant Sideoats Grama Plant Community
The lack 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, western meadowlark, and Cassin's sparrow stop using the community altogether. With the exception of the hawk species, most HCPC bird species would be only occasional users of these communities. Typical shortgrass prairie species such as horned lark, kildeer, long-billed curlew, McCown's longspur, and ferruginous hawk are dominant species. In addition, mountain plover, black-tailed prairie dog, and burrowing owl would be expected in this community where slopes are less than 5%.

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 exclusively are short-horned lizard and lesser earless lizard. Other reptiles using this community include the species listed for the HCPC.

Little Bluestem Plant Community
The dominant plants of little bluestem and yucca in this community make it unsuitable for mountain plover, prairie dog, and burrowing owl. Habitat conditions are marginal for many other species. Species that tolerate tall grasses and shrubs such as scaled quail may use this community. The mice, ground squirrels, rabbits, and reptiles from the HCPC would use this community.

Erosion Plant Community, Go-back Land, and Severely Eroded
The conditions in these communities are marginal for most wildlife species although species from the Blue Grama/Buffalograss Sod with Remnant Sideoats Grama Plant Community may occasionally be found here.

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 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
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
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
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																												
American vetch	D	P	P	D	D	P	P	D	D	P	P	D	D	P	P	D	D	P	P	D	D	P	P	D	D	P	P	D
Colorado greenthread	U	U	U	U	N	N	N	N	U	U	U	U	N	N	N	N	N	N	N	N	U	U	U	U	U	U	U	U
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
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
silverleaf scurfpea	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
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
stiff sunflower	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
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
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
wormwood	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																												
Arkansas rose	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	D	U
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
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
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
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, Sideoats (HCPC)	1000	0.32
Buffalograss/Blue Grama w/some Western Wheatgrass, Sideoats	700	0.22
Buffalograss/Blue Grama Sod with Remnant Sideoats	500	0.16
Little Bluestem, Excessive Litter	350	*
Reduced Plant Cover, Erosion	350	*

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 and C, with localized areas in hydrologic group D. Infiltration and runoff potential for this site varies from moderate to high depending on soil hydrologic group and 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 short grasses 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)
(067BY036CO) – Overflow

Similar Sites

(067BY052CO) – Loess Breaks
[located on steeper, broken areas]
(067BY063CO) – Gravel Breaks
[occurs on shallow, gravelly soils]

Inventory Data References

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

Those involved in developing this site 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 specific 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