

United States Department of Agriculture Natural Resources Conservation Service

Ecological Site Description

Site Type: Rangeland

Site Name: Gravelly Hills
(formerly Gravel Breaks in CO and Shallow to Gravel in NE)

Site ID: R072XA010KS

Major Land Resource Area: 72 – Central High Tableland

Due to the climatic gradient (effective precipitation, growing season, etc.) within MLRA - 72, the plant communities will differ between the northern and southern portions of this major land resource area. A transition zone within these two areas generally lies on either side of the Smokey Hill River drainage. Judgement will need to be used when determining which Ecological Site Description best fits field conditions within this transition zone.



Physiographic Features

This site occurs on level to steep terraces or terrace remnants that cap ridges, crests, and upper slopes of undulating or rolling uplands.

Landform: hill, plain

Aspect: N/A

	<u>Minimum</u>	<u>Maximum</u>
Elevation (feet):	2500	5000
Slope (percent):	0	60
Water Table Depth (inches):	60	60
Flooding:		
Frequency:	none	none
Duration:	none	none
Ponding:		
Depth (inches):	0	0
Frequency:	none	none
Duration:	none	none
Runoff Class:	negligible	low

Climatic Features

Annual precipitation ranges from 16 to 20 inches per year. Hourly winds are estimated to average about 10 miles per hour annually, ranging from 15-30 miles per hour during the spring to 5-15 miles per hour during late summer. Daytime winds are generally stronger than nighttime and occasional strong storms may bring brief periods of high winds with gusts to more than 50 miles per hour.

	<u>Minimum</u>	<u>Maximum</u>
Frost-free period (days):	141	155
Freeze-free period (days):	161	174
Mean Annual Precipitation (inches):	16	20

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

	Precip. Min.	Precip. Max	Temp. Min.	Temp. Max.
January	0.32	0.41	9.7	43.0
February	0.39	0.51	14.8	48.3
March	0.85	1.13	22.7	55.5
April	1.50	1.98	33.5	65.7
May	2.60	3.31	44.9	75.2
June	2.56	3.53	54.9	85.4
July	2.55	3.04	60.7	92.1
August	2.16	2.30	58.5	90.2
September	1.23	1.54	47.0	81.7
October	1.04	1.09	34.0	70.4
November	0.50	0.63	21.1	54.3
December	0.41	0.42	12.8	44.9

Climate Stations		Period	
Station ID	Location or Name	From	To
CO1121	Burlington, CO	1918	2001
CO9243	Wray, CO	1918	2001
KS3153	Goodland WSO, KS	1948	2001
NE4900	Lodgepole, NE	1948	2001
NE6065	North Platte WSO AP, NE	1948	2001

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

Influencing Water Features

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

Stream Type: None

Representative Soil Features

The soils on this site are shallow to moderately deep over sand and gravel. These soils contain significant amounts of gravel throughout the root zone. The available water capacity of these soils is very low to low. The organic matter content of these soils is low to moderate in the surface layer.

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: Blueridge, Dix, Eckley, Peetz, and Schamber.

Other soil series that have been correlated to this site include: Gravelly broken land, Otero gravelly complex, Simeon.

Parent Material Kind: alluvium

Parent Material Origin: sandstone

Surface Texture: sandy loam, loam

Surface Texture Modifier: gravelly, very gravelly

Subsurface Texture Group: sandy

Surface Fragments \leq 3" (% Cover): 0 - 50

Surface Fragments $>$ 3" (%Cover): 0 - 15

Subsurface Fragments \leq 3" (% Volume): 15 - 70

Subsurface Fragments $>$ 3" (% Volume): 5 - 25

	<u>Minimum</u>	<u>Maximum</u>
Drainage Class:	excessively	excessively
Permeability Class:	very slow	slow
Depth (inches):	40	80
Electrical Conductivity (mmhos/cm)*:	0	2
Sodium Absorption Ratio*:	0	0
Soil Reaction (1:1 Water)*:	5.6	8.4
Soil Reaction (0.1M CaCl₂)*:	N/A	N/A
Available Water Capacity (inches)*:	1.7	5.0
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:

The plant community for this site is dynamic due to the complex interaction of many ecological processes. The interpretive plant community for this site is the Historic Climax Plant Community (HCPC). The HCPC has been determined by the study of rangeland relic areas, areas protected from excessive disturbance, and areas under long-term rotational grazing strategies. Trends in plant community dynamics ranging from heavily grazed to lightly grazed areas, seasonal use pastures, and historical accounts have also been used.

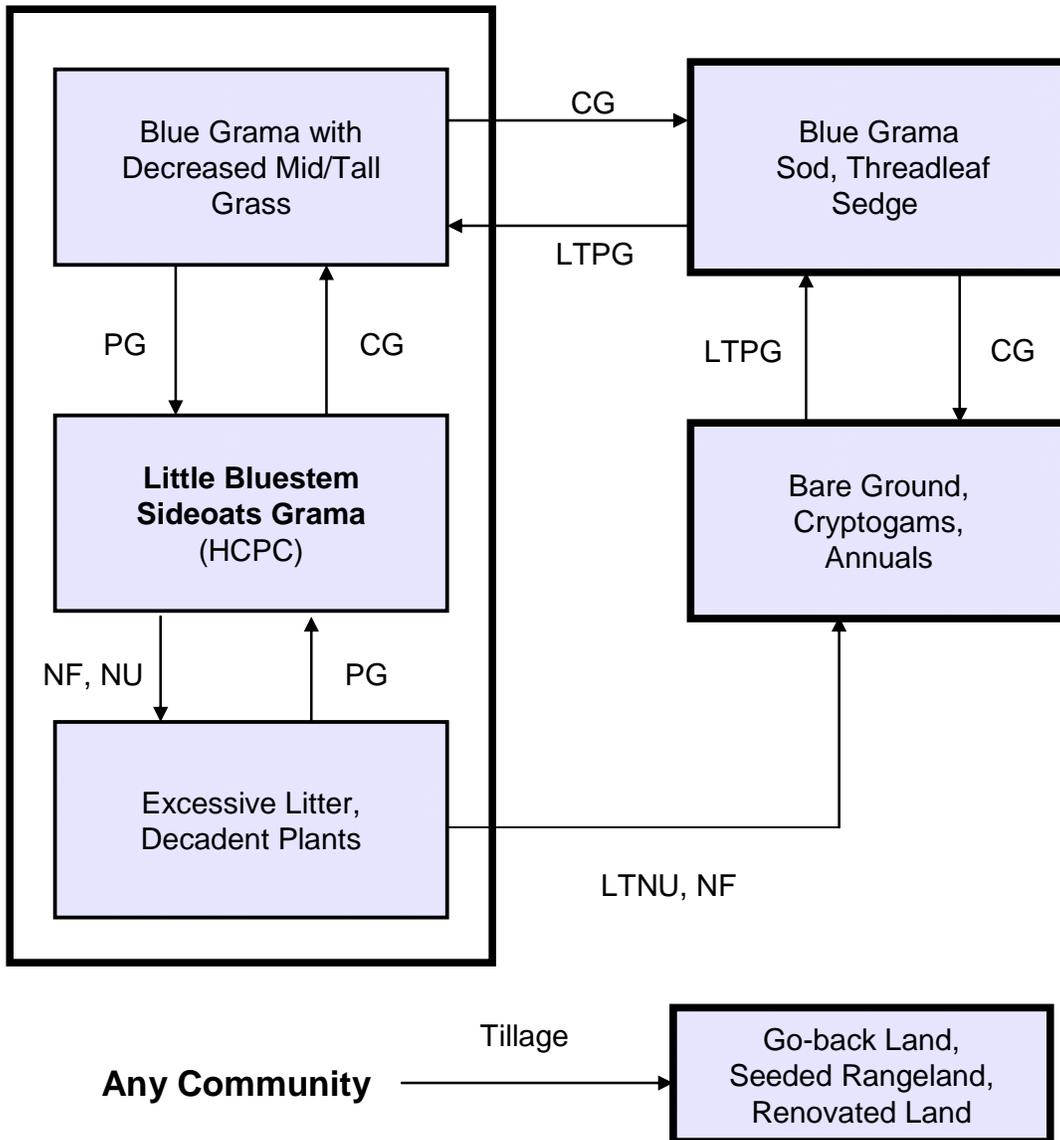
This site developed with occasional fires being part of the ecological processes. Historically, it is believed that the fires were infrequent, randomly distributed, and started by lightning at various times throughout the season when thunderstorms were likely to occur. It is also believed that pre-European inhabitants may have used fire as a management tool for attracting herds of large migratory herbivores (bison, elk, deer and pronghorn). The impact of fire over the past 100 years has been relatively insignificant due to the human control of wildfires.

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, switchgrass, prairie sandreed and big bluestem decrease in both frequency and production. Grasses and grass-like species 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.

Growth of native cool season plants begins about April 15, and continues to about June 15. Native warm season plants begin growth about May 15, and continue to about August 15. Fall green up of cool season plants may occur in September and October if adequate moisture is available.

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

Plant Communities and Transitional Pathways



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

Plant Community Composition and Group Annual Production

COMMON/GROUP NAME	SCIENTIFIC NAME	SYMBOL	Little Bluestem, Sideoats Grama (HCPC)		
			Group	lbs./acre	% Comp
GRASSES & GRASS-LIKES			1	900 - 1020	75 - 85
blue grama	Bouteloua gracilis	BOGR2	1	60 - 120	5 - 10
big bluestem	Andropogon gerardii	ANGE	1	60 - 180	5 - 15
little bluestem	Schizachyrium scoparium	SCSC	1	180 - 240	15 - 20
needleandthread	Hesperostipa comata ssp. comata	HECOC8	1	12 - 60	1 - 5
prairie sandreed	Calamovilfa longifolia	CALO	1	12 - 60	1 - 5
sideoats grama	Bouteloua curtipendula	BOCU	1	120 - 180	10 - 15
buffalograss	Boutelous dactyloides	BODA2	1	12 - 60	1 - 5
hairy grama	Bouteloua hirsuta	BOHI2	1	12 - 60	1 - 5
prairie junegrass	Koeleria macrantha	KOMA	1	12 - 24	1 - 2
red threeawn	Aristida purpurea var. longiseta	ARPUL	1	12 - 24	1 - 2
sand dropseed	Sporobolus cryptandrus	SPCR	1	12 - 60	1 - 5
switchgrass	Panicum virgatum	PAVI2	1	0 - 60	0 - 5
western wheatgrass	Pascopyrum smithii	PASM	1	0 - 36	0 - 3
Indian ricegrass	Achnatherum hymenoides	ACHY	1	0 - 24	0 - 2
bottlebrush squirreltail	Elymus elymoides ssp. elymoides	ELELE	1	0 - 12	0 - 1
plains muhly	Muhlenbergia cuspidata	MUCU3	1	0 - 12	0 - 1
sixweeks fescue	Vulpia octoflora	VUOC	1	0 - 12	0 - 1
ring muhly	Muhlenbergia torreyi	MUTO2	1	0 - 12	0 - 1
needleleaf sedge	Carex duriuscula	CADU6	1	12 - 24	1 - 2
sun sedge	Carex inops ssp. Heliophila	CAINH2	1	12 - 24	1 - 2
threadleaf sedge	Carex filifolia	CAFI	1	12 - 60	1 - 5
other perennial grasses		2GP	1	0 - 60	0 - 5
FORBS			2	60 - 180	5 - 15
bigtop dalea	Dalea enneandra	DAEN	2	0 - 24	0 - 2
curlycup gumweed	Grindelia squarrosa	GRSQ	2	0 - 24	0 - 2
cutleaf ironplant	Machaeranthera pinnatifida ssp. pinnatifida var. pinnatifida	MAPIP4	2	12 - 24	1 - 2
dotted gayfeather	Liatis punctata	LIPU	2	12 - 24	1 - 2
green sagewort	Artemisia dracunculus	ARDR4	2	0 - 24	0 - 2
greenthread	Thelesperma spp.	THELE	2	0 - 24	0 - 2
hairy goldaster	Heterotheca villosa	HEVI4	2	0 - 24	0 - 2
heath aster	Symphyotrichum ericoides	SYER	2	0 - 24	0 - 2
Hood's phlox	Phlox hoodii	PHHO	2	0 - 24	0 - 2
Lambert crazyweed	Oxytropis lambertii	OXLA3	2	0 - 24	0 - 2
mat loco	Astragalus kentrophyta	ASKE	2	0 - 24	0 - 2
Nuttall's evolvulus	Evolvulus nuttallianus	EVNU	2	0 - 24	0 - 2
penstemon	Penstemon spp.	PENST	2	12 - 24	1 - 2
prairie coneflower	Ratibida columnifera	RACO3	2	12 - 24	1 - 2
purple prairie clover	Dalea purpurea	DAPU5	2	12 - 24	1 - 2
pussytoes	Antennaria spp.	ANTEN	2	0 - 24	0 - 2
rush skeletonplant	Lygodesmia juncea	LYJU	2	0 - 24	0 - 2
scarlet globemallow	Sphaeralcea coccinea	SPCO	2	12 - 24	1 - 2
sessile nailwort	Paronychia sessiliflora	PASE	2	0 - 24	0 - 2
slimflower scurfpea	Psoralidium tenuiflorum	PSTE5	2	12 - 24	1 - 2
sulfur eriogonum	Eriogonum umbellatum	ERUM	2	0 - 24	0 - 2
threadleaf groundsel	Senecio flaccidus var. flaccidus	SEFLF	2	0 - 24	0 - 2
twogrooved milkvetch	Astragalus bisulcatus	ASBI2	2	0 - 24	0 - 2
variable senecio	Packera neomexicana var. mutabilis	PANEM	2	0 - 24	0 - 2
western ragweed	Ambrosia psilostachya	AMPS	2	0 - 24	0 - 2
white locoweed	Oxytropis sericea	OXSE	2	0 - 24	0 - 2
white prairie clover	Dalea candida	DACA7	2	0 - 24	0 - 2
woolly Indianwheat	Plantago patagonica	PLPA2	2	0 - 24	0 - 2
woolly locoweed	Astragalus mollissimus	ASMO7	2	0 - 24	0 - 2
Wyoming feverfew	Parthenium alpinum	PAAL6	2	0 - 24	0 - 2
other perennial forbs		2FP	2	12 - 60	1 - 5
SHRUBS			3	60 - 120	5 - 10
broom snakeweed	Gutierrezia sarothrae	GUSA2	3	0 - 24	0 - 2
chokecherry	Prunus virginiana var. virginiana	PRVIV	3	0 - 24	0 - 2
fringed sagebrush	Artemisia frigida	ARFR4	3	12 - 24	1 - 2
golden currant	Ribes aureum	RIAU	3	0 - 24	0 - 2
rubber rabbitbrush	Ericameria nauseosa ssp. nauseosa var. glabrata	ERNAG	3	0 - 24	0 - 2
plains pricklypear	Opuntia polyacantha	OPPO	3	0 - 24	0 - 2
purple pincushion	Escobaria vivipara var. vivipara	ESVIV	3	0 - 24	0 - 2
skunkbush sumac	Rhus trilobata	RHTR	3	12 - 24	1 - 2
small soapweed	Yucca glauca	YUGL	3	0 - 24	0 - 2
spreading buckwheat	Eriogonum effusum	EREF	3	0 - 24	0 - 2
winterfat	Krascheninnikovia lanata	KRLA2	3	0 - 24	0 - 2
other shrubs		2SHRUB	3	0 - 60	0 - 5
Annual Production lbs./acre			LOW	RV*	HIGH
GRASSES & GRASS-LIKES			490	990	1290
FORBS			55	120	185
SHRUBS			55	90	125
TOTAL			600	1200	1600

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

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 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-like, 5-15% 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, hairy grama and western wheatgrass. Threadleaf and sun sedge are common. Dominant forbs are purple prairie clover, dotted gayfeather and upright prairie coneflower. Skunkbush sumac and golden currant are some of the major shrubs found in this plant community.

Community dynamics, nutrient cycle, water cycle and energy flow are functioning properly. Litter is uniformly distributed where vegetative cover is continuous. Some litter movement may occur on steeper slopes. Decadence and natural plant mortality is low. This community is resistant to many disturbances except continuous grazing, tillage and/or development into urban or other uses.

Total annual production ranges from 600 to 1600 pounds of air-dried vegetation per acre per year and will average 1200 pounds.

The following is the growth curve expected during a normal year:

Growth Curve Number: KS7211

Growth Curve Name: Warm season dominant, cool-season sub-dominant; upland shallow soils

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
0	0	2	8	19	30	18	15	6	2	0	0

(monthly percentages of total annual growth)

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

- Continuous grazing will shift this plant community to the *Blue Grama with Decreased Mid/Tall Grass Plant Community*.
- Non-use (rest) and no fire will move this plant community to the *Excessive Litter, Decadent Plants Plant Community*.
- 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, switchgrass, prairie sandreed, needleandthread, western wheatgrass, purple prairie clover and skunkbush sumac have been significantly reduced. Hairy grama, sand dropseed, red threeawn as well as Hood's phlox, hairy goldaster, western ragweed, slimflower scurfpea, and small soapweed have increased.

Production 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. Pedestalled plants are common. Desertification is in an early stage.

Total annual production ranges from 400 to 1000 pounds of air-dried vegetation per acre per year and will average 600 pounds.

The following is the growth curve expected during a normal year:

Growth Curve Number: KS7212

Growth Curve Name: Warm season dominant; upland shallow soils

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
0	0	0	2	10	45	25	15	3	0	0	0

(monthly percentages of total annual growth)

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

- Continuous grazing will shift this plant community across an ecological threshold toward the *Blue Grama Sod, Threadleaf Sedge Plant Community*.
- Prescribed grazing which allows for adequate recovery periods following each grazing event and proper stocking will move this plant community to the *Little Bluestem, Sideoats Grama, Plant Community (HCPC)*.

Excessive Litter, Decadent Plants Community

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

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

Total annual production ranges from 200 to 800 pounds of air-dried vegetation per acre per year.

The following is the growth curve expected during a normal year:

Growth Curve Number: KS7213

Growth Curve Name: Excess litter; upland shallow soils

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
0	0	2	5	18	35	20	12	5	3	0	0

(monthly percentages of total annual growth)

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

- Prescribed grazing that allows for adequate recovery opportunity between grazing events will shift this plant community to the *Little Bluestem, Sideoats Grama Plant Community (HCPC)*.

- Long term non-use and No fire will move this plant community across an ecological threshold to the *Bare Ground, Cryptogams, and Annuals Plant Community*. This transition may take 40 years or more to achieve. Cyptogamic crusts increase under long-term non-use in the absence of fire, but decrease with continuous grazing.

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.

Total annual production ranges from 150 to 600 pounds of air-dried vegetation per acre per year and will average 400 pounds.

The following is the growth curve expected during a normal year:

Growth Curve Number: KS7211

Growth Curve Name: Warm season dominant, cool season sub-dominant; upland shallow soils

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
0	0	2	8	19	30	18	15	6	2	0	0

(monthly percentages of total annual growth)

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

- Continuous grazing will shift this plant community across an ecological threshold to the *Bare Ground, Cryptogams, and 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 continuous grazing without adequate recovery opportunity given during the growing season. Bare ground and annuals 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, and Hood's phlox) and small soapweed.

Cyptogamic crusts increase under long-term non-use in the absence of fire, but decrease with continuous grazing. Soil erosion is severe. Desertification is obvious.

Total annual production ranges from 50 to 200 pounds of air-dried vegetation per acre per year.

The following is the growth curve expected during a normal year:

Growth Curve Number: KS7214

Growth Curve Name: Early successional, bare ground; upland shallow soils

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
0	0	2	8	20	30	25	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 to 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.

Go-back Land, Seeded Rangeland or Renovated Land

This group includes three separate vegetation communities that are highly variable. They are derived through three distinct management scenarios, and are not related successionaly. Infiltration, runoff and soil erosion varies depending on the vegetation present.

Go-back Land

This plant community is created when the soil is tilled or farmed (sodbusted), and abandoned. All of the native plants are killed, soil organic matter/carbon reserves are reduced, soil structure is changed, and a plowpan or compacted layer can be formed decreasing water infiltration. Synthetic chemicals may remain as a residual from farming operations. In early successional stages, this community is not stable. Erosion is a concern.

An annual plant community such as Russian thistle, kochia, annual bromes, foxtail (bristlegrass) and other introduced annuals invade. These plants give some protection from erosion and start to rebuild e organic matter. This plant community is gradually replaced by early perennial species such as threeawn and dropseed. Little bluestem, sideoats grama or blue grama can become established depending upon whether a remnant seed source is available. Eventually other perennial warm and cool season species can establish. This successional process takes many years as the soil is being developed. The process is speeded up with prescribed grazing.

Renovated Land

This plant community is the result of mechanical treatment to a sod bound plant community. The purpose of mechanical treatment is to improve production and plant composition. These mechanical treatments include contour furrowing, contour pitting, terracing, chiseling, disking and interseeding. Many of these treatments were implemented during the 1930's through the 1960's and have shown to have no significant long-term benefits for improving production. Many of these practices result in a permanently rough ground surface.

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. Prescribed grazing with adequate recovery periods will be needed to maintain productivity and desirable species. Species diversity on seeded rangeland is often lower and native forb species generally take longer to re-establish.

Ecological Site Interpretations (under development)

Animal Community – Wildlife Interpretations

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
plains muhly	U U D U	U U D U	U U D U	N N N N	N N N N	U U D U	U U D 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
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
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
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
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 U D U	U U D 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
threadleaf sedge	U D U D	U P N D	U D U D	U D U D	U D U D	U D U D	U D U D
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
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
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
switchgrass	U D D U	U D U U	U D D U	N N N N	N N N N	U D D U	U D D U
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
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
western wheatgrass	U P D D	U P D D	U P D D	U P D D	U P D D	U P D D	U P D D
Forbs							
cutleaf ironplant	U U U U	N U U N	U U U U	N U U N	N U U N	U U U U	N U U N
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
green sagewort	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
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	N N N N
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	N N N N
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 P 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 P P 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 D U U
Nuttall's evolvulus	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
penstemon	U U U U	U P P U	U U U U	U P P U	U P P U	U U U U	U P P U
prairie coneflower	U U D U	U P P U	U U D U	U P P U	U P P U	U U D U	U P P U
purple prairie clover	U P P D	U P P U	U P P D	U P P U	U P P U	U P P D	U P P D
pussytoes	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
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
sessile nailwort	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
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
sulfur eriogonum	U D U U	U U U U	U D U U	U U U U	U U U U	U D U U	U U U U
threadleaf groundsel	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
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
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
white 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
white prairie clover	U D P U	U P P U	U D P U	U P P U	U P P U	U D P U	U P P 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
curlycup gumweed	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
Wyoming feverfew	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
bigtop dalea	U D P U	U P P U	U D P U	U P P U	U P P U	U D P U	U P P U
Shrubs							
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
golden currant	U D D U	U P P D	U D D U	U P P D	U U U U	U D D U	U P P D
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
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
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 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 D P	P P P P	P P D P	P P P P	P P P P	P P D P	P P D P
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	P U D P	D U U D	D T T D	P U U 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	Total Production (lbs./acre)	*Stocking Rate (AUM/acre)
Little Bluestem, Sideoats Grama (HCPC)	1200	0.33
Blue Grama w/Decreased Mid/Tall Grasses	600	0.16
Blue Grama Sod, Threadleaf Sedge	400	0.11
Excessive Litter, Decadent Plants	**	**
Bare Ground, Cryptogams, Annuals	**	**

* Based on 912 lbs./acre (air-dry weight) per Animal Unit Month (AUM), and on 25% harvest efficiency (refer to USDA NRCS, National Range and Pasture Handbook).

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

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.

Hydrology Functions (under development)

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

None noted.

Supporting Information

Associated Sites

- (072XA015KS) – Loamy Upland
- (072XA012KS) – Limy Upland
- (072XA022KS) – Sandy

Similar Sites

- (072XA056CO) – Sandstone Breaks
[higher production, sandstone outcrop instead of gravel]
- (072XA028KS) – Shallow Limy
[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, Colorado; Josh Saunders, Rangeland Management Specialist, NRCS Colorado ; Herman Garcia, State Rangeland Management Specialist, Colorado ; Carol Eakins, Rangeland Management Specialist, NRCS, Nebraska; Chuck Markley, Soil Scientist, NRCS, Nebraska; Jeff Nichols, Rangeland Management Specialist, NRCS, Nebraska; Mary Schrader, Resource Conservationist NRCS, Nebraska; Dana Larsen, State Rangeland Management Specialist, Nebraska; Joan Gienger, District Conservationist, NRCS, Kansas; Ted Houser, District Conservationist, NRCS, Kansas; David Kraft, State Rangeland Management Specialist, Kansas;.

State Correlation

This site has been correlated with Colorado, Kansas and Nebraska in MLRA -72.

Field Offices

Colorado: Akron, Burlington, Cheyenne Wells, Eads, Flagler, Holly, Holyoke, Julesburg, Sterling, Yuma, Wray

Kansas: Atwood, Colby, Goodland, Gove, Hoxie, Oakley, Oberlin, Sharon Springs, St. Francis

Nebraska: Curtis, Grant, Hayes Center, Imperial, Kimball, McCook, North Platte, Ogallala, Oshkosh, Sidney, Trenton

Other References

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

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

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. 2005. The PLANTS Database, Version 3.5 (<http://plants.usda.gov>). National Plant Data Center, Baton Rouge, LA 70874-4490 USA.

Site Description Approval

State Range Management Specialist (Kansas)

Date

State Range Management Specialist (Colorado)

Date

State Range Management Specialist (Nebraska)

Date