USDA Natural Resources Conservation Service

Ecological site R051XA006NM
Breaks

Last updated: 12/11/2024
Accessed: 05/11/2025

General information

Provisional. A provisional ecological site description has undergone quality control and quality assurance review. It contains a working state and transition model and enough information to identify the ecological site.

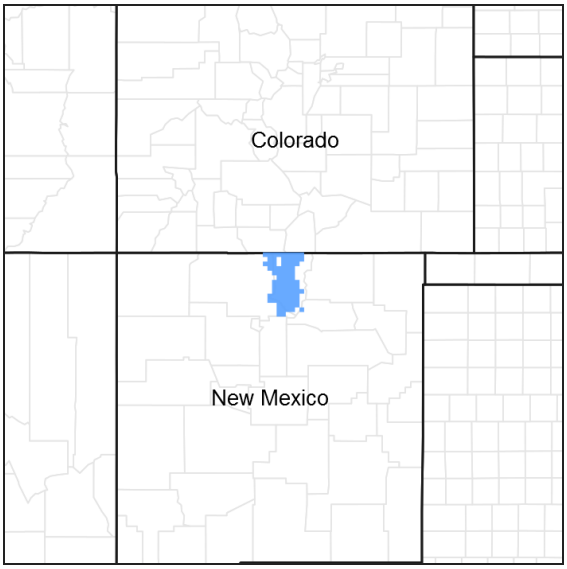


Figure 1. Mapped extent

Areas shown in blue indicate the maximum mapped extent of this ecological site. Other ecological sites likely occur within the highlighted areas. It is also possible for this ecological site to occur outside of highlighted areas if detailed soil survey has not been completed or recently updated.

MLRA notes

Major Land Resource Area (MLRA): 051X–High Intermountain Valleys

This MLRA encompasses the San Luis Valley in south central Colorado and the Taos Plateau and Taos alluvial piedmonts of north central New Mexico. As part of the northern portion of the Rio Grande Rift, the MLRA consists of large, alluvium filled basins washed down from adjacent mountain ranges. The Rio Grande River flows through this MLRA, continuing its long function of carrying mountain sediment down to the basin. Cenozoic volcanism is an extensive characteristic of the MLRA where large basalt flows with volcanic hills and domes are abundant. Ancient Lake Alamosa is a large feature within the MLRA.

Classification relationships

NRCS:
Major Land Resource Area 51, High Intermountain Valleys (United States Department of Agriculture, Natural Resources Conservation Service, 2006).

USFS:
331J – Northern Rio Grande Basin M331Ic > 331Ja - San Luis Valley, 331Jb - San Luis Hills and 331C - Mogotes

EPA:

22 - Arizona/New Mexico Plateau > 22a - San Luis Shrublands and Hills ; 22b -San Luis Alluvial Flats and Wetlands ; 22c - Salt Flats; 22e - Sand Dunes and Sand Sheets and 22f -Taos Plateau (Griffith, 2006).

USGS:
Southern Rocky Mountain Province

Ecological site concept

Soils are skeletal (>35% rock fragments). They are classified as orthents, meaning they are entisols, soils which lack horizon development. In this case it is due to steep slopes. Soil depth varies from very shallow to very deep over a lithic and paralithic contact. Surface textures range from loam to clay loam. Associated rock outcrop is common. Slope ranges from 40 percent to 80 percent.

Associated sites

F048AY925CO	**Ponderosa Pine Forest** This site occurs on hillsides, mountain-slopes, mesas, structural benches and cuestas. Slopes are 3 to 30%. Soils are moderately deep to very deep (20 to 60+ inches). Soils are derived from slope alluvium from sandstone and/or shale, colluvium from sandstone and/or shale, or residuum from sandstone and shale. Soil surface texture is a loam, clay loam, sandy loam, fine sandy loam, very stony loam, cobbly sandy loam, or very boulder sandy loam with fine textured subsurface. It has a typic ustic moisture regime. The effective precipitation ranges from 16 to 20 inches.
R048AY005NM	**Mountain Malpais** This site is characterized by flat to moderately steep topography. It is frequently found where the basalt caps are present. The site's terrain may be interrupted by extrusions of the basalt, leaving a rough or choppy appearance to the topography. Boulders on the surface are common. The dominant slope range is from 3 to 30 percent, but it some site range up to 55 percent. These soils are very shallow to shallow, and formed in debris from basalt and other volcanic rock or metamorphic rock.
R036XB018NM	**Stony Loam** This site occurs on nearly level alluvial fans, stream terraces, plateaus, mesas and volcanic cones. The typical surface soil textures are loam or cobbly loam. It has an aridic ustic/ustic arid moisture regime and mesic temperature regime. The effective precipitation ranges from 10 to 16 inches.
R051XA001NM	**Loamy** The Loamy site occurs on the alluvial fans, valley sides or mountain valleys on slopes less than 5 percent. The site is fine-loamy or fine-loamy over sandy or sandy-skeletal family particle size. Parent material is slope alluvium derived from igneous (i.e. granite) and metamorphic rock (i.e gneiss). Soil surface textures range from loam to clay loam.
F036XA001NM	**Pinyon Upland** This site occurs on escarpments, fan plateaus. mesas and cuestas. The soil surface is sandy in textures. Common soil surface textures are fine sandy loam, loam or sandy loam. The effective precipitation ranges from 10 to 16 inches. It is a Pinyon-Juniper site.

Similar sites

R051XY277CO	**Basalt Hill 7-12 PZ** The Basalt Hills site occurs on extrusive igneous features such as basalt flows and andesitic and rhyolitic vents and plugs. It differs from the Breaks site as does not have warm season species such as black grama or sideoats grama. The Breaks site is also associated with the Rio Grande Canyon.

Table 1. Dominant plant species

Tree	(1) *Juniperus monosperma* (2) *Pinus edulis*
Shrub	(1) *Artemisia tridentata*
Herbaceous	(1) *Bouteloua eriopoda* (2) *Achnatherum hymenoides*

Physiographic features

The Breaks site occurs primarily on slopes of the Rio Grande Canyon and a few associated canyons of the Taos Plateau volcanic field. The site begins just north of Ute Mountain and extends south and down in elevation as the Rio Grande cuts across basalt flows and layers of sediment to its southern extent near the town of Pilar and the Embudo fault. Elevation ranges from 6400 to 8000 feet. Associated rock outcrop is common. Slope ranges from 40 percent to 80 percent.

Table 2. Representative physiographic features

Landforms	(1) Breaks
Runoff class	High to very high
Flooding frequency	None
Ponding frequency	None
Elevation	6,400–8,500 ft
Slope	40–80%
Aspect	W, NW, N, NE, E, SE, S, SW

Climatic features

Mean annual precipitation varies from 9 to 14 inches. Deviations of 4 inches or more are quite common. Approximately 60 percent of the precipitation is received during the native plant growth period, April through September. During July, August, and September, 4 to 5 inches of precipitation influence the presence and production of warm-season plants. Fall and spring moisture is conducive to the growth of cool-season herbaceous plants. Maximum shrub growth also occurs during this time. Summer precipitation is characterized by brief, localized thunderstorms. Winter moisture usually occurs as snow or light rain.

Mean annual temperature varies from 64 degrees F in July to 21 degrees F in January. The maximum is near 100 degrees F. The minimum is near 40 degrees F. The average last killing frost in the spring is around mid-May. The first killing frost in the fall is late September or early October. The frost-free period is approximately 120 to 140 days, but freezing temperatures have been recorded for every month except July and August. Temperatures are generally conducive for herbaceous plant growth from April through September.
Wind velocities are relatively light most of the year with stronger winds occurring in spring and early summer. These stronger winds, which may exceed 25 miles per hour, increase transpiration rates of plants and rapidly dry the soil surface.

Table 3. Representative climatic features

Frost-free period (characteristic range)	89 days
Freeze-free period (characteristic range)	99 days
Precipitation total (characteristic range)	9-14 in
Frost-free period (actual range)	89 days
Freeze-free period (actual range)	99 days
Precipitation total (actual range)	9-14 in
Frost-free period (average)	89 days
Freeze-free period (average)	99 days
Precipitation total (average)	12 in

Climate stations used

- (1) CERRO [USC00291630], Questa, NM

Influencing water features

This site does not have a water table.

Soil features

Soils are skeletal (>35% rock fragments). Soils assigned to this site are above soil family taxonomy level. They are classified as orthents, meaning they are entisols or haplocalcids, meaning they are Aridisols. Soil depth varies over a lithic and paralithic contact with no restrictions listed within 60 inches. Surface textures range from gravelly loam to cobbly loam.

Table 4. Representative soil features

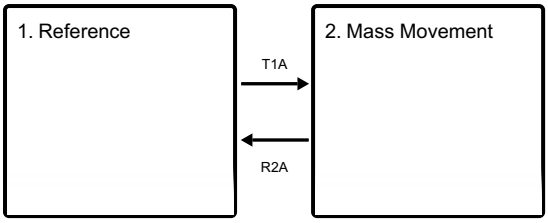
Parent material	(1) Residuum–igneous and metamorphic rock (2) Slope alluvium–igneous and metamorphic rock (3) Residuum–basalt
Surface texture	(1) Gravelly loam (2) Cobbly loam
Family particle size	(1) Not used
Drainage class	Well drained
Permeability class	Moderate to moderately rapid
Soil depth	60–120 in
Surface fragment cover <=3"	30–45%
Surface fragment cover >3"	0–5%
Available water capacity (Depth not specified)	2.2–4.8 in
Calcium carbonate equivalent (Depth not specified)	1–35%
Electrical conductivity (Depth not specified)	0–2 mmhos/cm
Sodium adsorption ratio (Depth not specified)	0–2
Soil reaction (1:1 water) (Depth not specified)	7.5–8.4
Subsurface fragment volume <=3" (Depth not specified)	35–45%
Subsurface fragment volume >3" (Depth not specified)	0–5%

Ecological dynamics

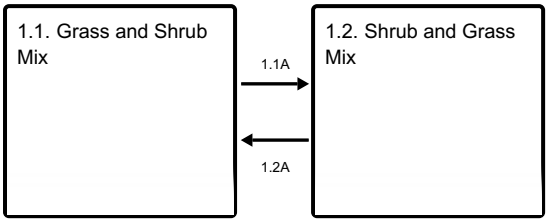
The potential plant community on this site is a mix of grasses, forbs and shrubs. Scrubby oneseed juniper and/or pinyon pine does occur on cooler exposures, but they make up a minor part of the plant community. On warm, dry aspects, warm season grasses such as black grama and sideoats grama are more dominant. On cool, moist aspects, cool season grasses such as Indian ricegrass, needle-and-thread, New Mexico feathergrass, and western wheatgrass, along with shrubs such as big sagebrush become more dominant. Plant cover becomes less as slope percentage increases and soil becomes more susceptible to mass movement such as creep, landslides and rockslides. In a few places springs or seeps issue from the canyon walls creating more robust pockets of trees and shrubs.

State and transition model

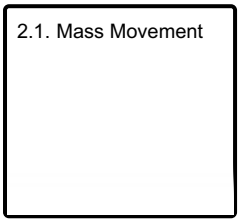
Ecosystem states



State 1 submodel, plant communities



State 2 submodel, plant communities



State 1
Reference

The reference state has a large gradient of soil temperature, moisture, slope, and depth. As a result, cool season grass-shrub communities will grade into warm season grass dominant communities. As slope increases, bare ground increases due to mass movement of rock and soil.

Resilience management. The reference state has the greatest resilience to disturbance such as fire, drought, recreational impacts, and limited livestock grazing.

Community 1.1
Grass and Shrub Mix

On the warmer, drier end of the gradient, dominant plants include black grama, sideoats grama, blue grama, hairy grama, galleta, and cane bluestem. As the site grades to a cooler-wetter temperature-moisture regime, species such as Indian ricegrass, needle and thread, New Mexico feathergrass, western wheatgrass, and big sagebrush become more dominant.

Resilience management. The reference community has the greatest resilience to disturbances such as drought, fire, recreation, and livestock grazing. The mix of grasses and shrubs helps hold the soil in place and improves moisture retention.

Table 5. Annual production by plant type

Plant Type	Low (Lb/Acre)	Representative Value (Lb/Acre)	High (Lb/Acre)
Grass/Grasslike	265	370	475
Shrub/Vine	165	230	295
Forb	50	70	90
Total	**480**	**670**	**860**

Table 6. Ground cover

Tree foliar cover	0-5%
Shrub/vine/liana foliar cover	10-30%
Grass/grasslike foliar cover	10-30%
Forb foliar cover	2-5%
Non-vascular plants	0%
Biological crusts	0%
Litter	5-10%
Surface fragments >0.25" and <=3"	25-35%
Surface fragments >3"	5-15%
Bedrock	0-5%
Water	0%
Bare ground	15-25%

Figure 9. Plant community growth curve (percent production by month). NM3505, R051XA006NM Breaks HCPC. R051XA006NM Breaks HCPC.

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	0	3	5	10	10	25	30	12	5	0	0

Community 1.2
Shrub and Grass Mix

On the cooler-wetter portion the dominant shrub is big sagebrush. There may also be thick clusters of juniper and pinyon pine. Grasses become sub dominant. Shrubs such as apache plume and shrub oak may increase on the warmer, drier portion but not dominate like the sagebrush on the cooler end.

Resilience management. This community has lost some diversity in above and below ground flora and fauna. Water retention has decreased as fibrous root systems are less prevalent to feed soil microbial communities and produce water absorbing organic matter. The site becomes drier and less resistant to disturbance such as drought, fire, recreational impacts, and livestock grazing.

Pathway 1.1A
Community 1.1 to 1.2

Over time, shrubs gain a competitive advantage due to tap roots that can extend into the cracks and fissures of the bedrock. These roots anchor the plants in place and capture water and nutrients deep into the parent material.

Pathway 1.2A
Community 1.2 to 1.1

A disturbance, mostly fire but possibly disease, opens the canopy for increased colonization of grasses and forbs.

State 2
Mass Movement

Resilience management. Resilience to mass movement is low, especially as slopes become steeper. This can include slow displacements such as creep or rapid movements such as landslides and rock slides (Schoeneberger and Wysocki, 2012). Without plants acting as physical barriers, anchored by root systems, slow displacements will lead to rapid movements.

Community 2.1
Mass Movement

Plant species are low in vigor, production, and density. Root systems that anchor plants and slow mass movement have decreased. A few shrubs, trees and patches of grasses exist in small concave positions.

Transition T1A
State 1 to 2

Disturbance that decreases the plant density and cover causes this site to cross a threshold to the mass movement state. This may include extended drought, greater than five years, which leads to disease and plant mortality. This may also include excessive, repetitive grazing and browsing in select areas where livestock have access. This excessive grazing reduces plant cover and density while depleting stabilizing root systems. Plants may also decrease due to recreational and infrastructure impacts such as roads, trails and areas of high fire frequency due to recreational campfire initiation.

Restoration pathway R2A
State 2 to 1

Once mass movement begins rapidly with landslides and rockslides, it will take time for gravity to work, allowing the angle of slope to decrease and the site to naturally begin to stabilize. Over time plants will begin to recolonize bare areas and produce cover and stabilizing root systems.

Additional community tables

Table 7. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Lb/Acre)	Foliar Cover (%)
Grass/Grasslike					
1				35–140	
	black grama	BOER4	*Bouteloua eriopoda*	35–140	–
1				35–70	
	sideoats grama	BOCU	*Bouteloua curtipendula*	35–70	–
1				70–140	
	Indian ricegrass	ACHY	*Achnatherum hymenoides*	35–70	–
	needle and thread	HECO26	*Hesperostipa comata*	35–70	–
	New Mexico feathergrass	HENE5	*Hesperostipa neomexicana*	35–70	–
	western wheatgrass	PASM	*Pascopyrum smithii*	35–70	–
1				20–70	
	prairie Junegrass	KOMA	*Koeleria macrantha*	20–70	–
	muttongrass	POFE	*Poa fendleriana*	20–70	–
1				20–50	
	blue grama	BOGR2	*Bouteloua gracilis*	20–50	–
	hairy grama	BOHI2	*Bouteloua hirsuta*	20–50	–
	James' galleta	PLJA	*Pleuraphis jamesii*	20–50	–
1				20–35	
	cane bluestem	BOBA3	*Bothriochloa barbinodis*	20–35	–
	little bluestem	SCSC	*Schizachyrium scoparium*	20–35	–
1				20–35	
	Graminoid (grass or grass-like)	2GRAM	*Graminoid (grass or grass-like)*	20–35	–
	common wolfstail	LYPH	*Lycurus phleoides*	20–35	–
Forb					
2				35–105	

2				35–105	
	Forb (herbaceous, not grass nor grass-like)	2FORB	*Forb (herbaceous, not grass nor grass-like)*	35–105	–
	aster	ASTER	*Aster*	35–105	–
	scarlet Indian paintbrush	CACO17	*Castilleja coccinea*	35–105	–
	fleabane	ERIGE2	*Erigeron*	35–105	–
	buckwheat	ERIOG	*Eriogonum*	35–105	–
Shrub/Vine					
3				35–105	
	big sagebrush	ARTR2	*Artemisia tridentata*	35–105	–
3				20–50	
	fourwing saltbush	ATCA2	*Atriplex canescens*	20–50	–
	winterfat	KRLA2	*Krascheninnikovia lanata*	20–50	–
3				20–50	
	oak	QUERC	*Quercus*	20–50	–
	skunkbush sumac	RHTR	*Rhus trilobata*	20–50	–
	currant	RIBES	*Ribes*	20–50	–
3				5–35	
	hairy mountain mahogany	CEMOP	*Cercocarpus montanus var. paucidentatus*	5–35	–
	Apache plume	FAPA	*Fallugia paradoxa*	5–35	–
	stretchberry	FOPUP	*Forestiera pubescens var. pubescens*	5–35	–
Tree					
4				5–35	
	Shrub, deciduous	2SD	*Shrub, deciduous*	5–35	–
	juniper	JUNIP	*Juniperus*	5–35	–
	twoneedle pinyon	PIED	*Pinus edulis*	5–35	–

Animal community

Grazing:
Approximately 75 percent of the vegetation produced on this site are suitable for grazing or browsing by domestic livestock and wildlife. Grazing distribution is a problem due to this site being in association with steep and rocky landscapes. Herding and trail construction may be necessary to achieve proper distribution on these sites when in complex with rock outcrop and other miscellaneous land types.

Deterioration of the potential plant community is indicated by a decrease in such species as western wheatgrass, spike muhly, sideoats grama, four-wing saltbush, and winterfat. Species that increase include blue grama, galleta, hairy grama, threeawns, and undesirable woody species. A planned grazing system with periodic deferment is best to maintain the desirable balance between plant species and to maintain high productivity.

Habitat for Wildlife:
This site provides habitats which support a resident animal community that is characterized by bobcat, mountain lion, rock squirrel, rock mouse, least chipmunk, deer mouse, golden eagle, prairie falcon, raven, canyon wren, Say’s phobe, cliff swallow and western diamondback rattlesnake. The rock outcrops and talus slopes provide nesting sites for many species of summer breeding birds. Rocky Mountain bighorn sheep have been released into the gorge. They have multiplied and thrived as they are well suited for the steep, rocky terrain.

Hydrological functions

The runoff curve numbers are determined by field investigations using hydrologic cover conditions and hydrologic soil groups.

Recreational uses

This site is well suited to nature observation, hiking, and hunting. The canyon land setting enhances the natural beauty of this site.

Wood products

Due to the physiography of this site, this site should not be considered as a major source for wood products.

Other information

Guide to Suggested Initial Stocking Rate Acres per Animal Unit Month

Similarity Index Ac/AUM
100 - 76 6.0 – 9.5
75 – 51 9.0 – 11.9
50 – 26 11.5 – 23.5
25 – 0 23.5+

Inventory data references

Field Offices in Colorado where the site occurs:
Chama, NM

Type locality

Location 1: Taos County, NM
Location 2: Santa Fe County, NM

References

Schoeneberger, P.J. and D.A. Wysocki. 2012. Geomorphic Description System. Natural Resources Conservation Service, 4.2 edition. National Soil Survey Center, Lincoln, NE.

Other references

Chapman, S.S., G.E. Griffith, J.M. Omernik, A.B. Price, J. Freeouf, and D.L. Schrupp. 2006. Ecoregions of Colorado. (2-sided color posterwith map, descriptive text, summary tables, and photographs). U.S. Geological Survey, Reston, VA. Scale 1:1,200,000.

Cleland, D.T.; Freeouf, J.A.; Keys, J.E.; Nowacki, G.J.; Carpenter, C.A.; and McNab, W.H. 2007. Ecological Subregions: Sections andSubsections for the conterminous United States. Gen. Tech. Report WO-76D [Map on CD-ROM] (A.M. Sloan, cartographer). Washington,DC: U.S. Department of Agriculture, Forest Service, presentation scale 1:3,500,000; colored.

United States Department of Agriculture, Natural Resources Conservation Service. 2006. Land Resource Regions and Major Land Resource Areas of the United States, the Caribbean, and the Pacific Basin. U.S. Department of Agriculture Handbook 296.

Contributors

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Approval

Kirt Walstad, 12/11/2024

Acknowledgments

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--Site Development and Testing Plan--:
Future work to validate and further refine the information in this Provisional Ecological Site Description is necessary. This will include field activities to collect low-, medium-, and high-intensity sampling, soil correlations, and analysis of that data.

Additional information and data are required to refine the Plant Production and Annual Production tables for this ecological site. The extent of MLRA 51 must be further investigated.

Field testing of the information contained in this Provisional ESD is required. As this ESD is moved to the Approved ESD level, reviews from the technical team, quality control, quality assurance, and peers will be conducted.

Rangeland health reference sheet

Interpreting Indicators of Rangeland Health is a qualitative assessment protocol used to determine ecosystem condition based on benchmark characteristics described in the Reference Sheet. A suite of 17 (or more) indicators are typically considered in an assessment. The ecological site(s) representative of an assessment location must be known prior to applying the protocol and must be verified based on soils and climate. Current plant community cannot be used to identify the ecological site.

Author(s)/participant(s)	Scott Woodall
Contact for lead author	
Date	06/29/2012
Approved by	Kirt Walstad
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

Indicators

1. **Number and extent of rills:** Because this site is armored with a gravel mulch there is no sign of rills.

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2. **Presence of water flow patterns:** None to very rare. They may be present of steeper slopes following intense rain events. Flow pats are short and disconnected and are broken by basalt surface rock.

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3. **Number and height of erosional pedestals or terracettes:** Terracettes may be present after intense storm events. They will be associated with water flow patterns on steeper slopes. Pedestals will be very minor, around bunch grasses on steeper slopes.

4. **Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):** There is very little bare ground on this site, less than five percent. Plants and extensive rock and gravel mulch cover and protect the soil.

5. **Number of gullies and erosion associated with gullies:** This is not a site that forms gullies. Plant cover and armoring from rocks and gravel keep the soil in place.

6. **Extent of wind scoured, blowouts and/or depositional areas:** There should be no wind erosion occurring on this site. The soil is heavily covered and protected from the wind. Occasionally wind blown deposits from other areas can collect under shrubs.

7. **Amount of litter movement (describe size and distance expected to travel):** Some movement if litter is expected due to the steepness of the slope. Distance of travel varies from 1-2 feet following intense rainfall events. Litter will be caught by surface rock.

8. **Soil surface (top few mm) resistance to erosion (stability values are averages - most sites will show a range of values):** This site should have a soil stability rating of 4-5 in the interspaces and 5-6 underneath plants.

9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** Surface soils are gravelly or cobbly loam. The A-horizon ranges from 0-10 inches in depth and color ranges from brown to dark brown. Surface structure is moderate medium granular structure. Rock fragments can makeup 35-55% of the volume. Soil organic matter is around 1%.

10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:** The distribution and composition of grass, shrub, tree, forb canopy plus associated diverse root structures reduces raindrop impact and slows overland flow providing increased time for infiltration to occur. Also, the abundance of rock on the surface, slows runoff velocity and increases infiltration.

11. **Presence and thickness of compaction layer (usually none; describe soil profile features which may be mistaken for compaction on this site):** There is no presence of a compaction layer on this site.

12. **Functional/Structural Groups (list in order of descending dominance by above-ground annual-production or live foliar cover using symbols: >>, >, = to indicate much greater than, greater than, and equal to):**

    Dominant: Cool season bunchgrasses (indian ricegrass, bottlebrush squirreltail, scribners needlegrass, needleandthread>

    Sub-dominant: Sub-dominant: shrubs (Greene's rabbitbrush, big sagebrush, fourwing saltbush, winterfat, rubber rabbitbrush) > warm season bunchgrasses (blue grama, sand dropseed, spike dropseed, threeawn, galleta, little bluestem) > warm season stoloniferous grasses (black grama) > cool season rhizomatous grasses (western wheat) = forbs: (asters, Colorado four o'clock, scarlet globemallow, finged sagewort, buckwheats) >

Other: Others: trees (pinon, juniper)

Additional:

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13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):** During years with average to above-average precipitation, there should be very little recent mortality or decadence apparent in either the grasses or shrubs. Some mortality of cool season bunchgrasses may occur during severe winter droughts.

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14. **Average percent litter cover (%) and depth (in):** Litter cover can be fairly minimal on this site (5-15%). Nearly all litter will be leaves and small stems and most will be accumulated around shrubs and rock. Litter redistribution following natural extreme runoff events can reduce litter cover by concentrating it in low lying areas.

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15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):** Long term average of 670 pounds per acre; 480 pounds during unfavorable conditions, 860 pounds during above average precipitation years. After extended drought or the first growing season following wildfire, production may be reduced to 100 pounds.

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16. **Potential invasive (including noxious) species (native and non-native). List species which BOTH characterize degraded states and have the potential to become a dominant or co-dominant species on the ecological site if their future establishment and growth is not actively controlled by management interventions. Species that become dominant for only one to several years (e.g., short-term response to drought or wildfire) are not invasive plants. Note that unlike other indicators, we are describing what is NOT expected in the reference state for the ecological site:** Prickly pear cactus can increase as this site moves to a degraded state.

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17. **Perennial plant reproductive capability:** During years with average or above average growing conditions, all perennial plants should have the ability in most years to reproduce seed, tillers, or sprouts. During extended periods of drought, reproductive capability may be severely restricted.
