

## **Ecological site R034AY298CO Rolling Loam**

Last updated: 9/07/2023  
Accessed: 05/11/2025

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### **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.

### **MLRA notes**

Major Land Resource Area (MLRA): 034A—Cool Central Desertic Basins and Plateaus

Major Land Resource Area (MLRA): 34A—Cool Central Desertic Basins and Plateaus

For further information regarding MLRAs, refer to:

<http://soils.usda.gov/survey/geography/mlra/index.html>

### **LRU notes**

Land Resource Unit (LRU) 34A-10:

- Moisture Regime: aridic ustic
- Temperature Regime: frigid
- Dominant Cover: rangeland
- Representative Value (RV) Effective Precipitation: 12-15 inches
- RV Frost-Free Days: 75-95 days

### **Classification relationships**

Relationship to Other Established Classification Systems

National Vegetation Classification System (NVC):

3 Semi-Desert

3.B.1 Cool Semi-Desert Scrub & Grassland

D040 Western North American Cool Semi-Desert Scrub & Grassland

M169 Great Basin & Intermountain Tall Sagebrush Shrubland & Steppe Group

A3184 Wyoming big sagebrush Dry Steppe and Shrubland Alliance

CEGL001043 *Artemisia tridentata* ssp. *wyomingensis*/Elymus elymoides Shrubland Association

Ecoregions (EPA):

Level I: 10 North American Deserts

Level II: 10.1 Cold Deserts

Level III: 10.1.4 Wyoming Basin

### **Ecological site concept**

- Site does not receive any additional water.
- Soils are:
  - o may be slightly saline or saline-sodic.
  - o are deep, very deep

- o are not skeletal within 20" of soil surface, minimal rock fragments at the soil surface
- o are not strongly or violently effervescent in surface mineral 10".
- o surface textures usually range from loamy fine sand to fine sandy loam in surface mineral 4".
- Slope is less than 30%.
- Clay content is less than 35% and greater than 18% in mineral soil surface 1-2".

## Associated sites

R034AY330CO	<b>Sandy Land</b> Site has coarser textured soils
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## Similar sites

R034AY424CO	<b>Loamy 7-10 PZ</b> Site has lower precipitation, lower production
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**Table 1. Dominant plant species**

Tree	Not specified
Shrub	(1) <i>Artemisia tridentata ssp. wyomingensis</i> (2) <i>Chrysothamnus viscidiflorus</i>
Herbaceous	(1) <i>Pascopyrum smithii</i> (2) <i>Hesperostipa comata</i>

## Physiographic features

The landscape characteristics of this site is nearly level to moderately steep. Degree of slope ranges from 0 to 30 percent with the direction of slope not affecting the site.

Elevation ranges from 5500 to 7000 feet above sea level.

**Table 2. Representative physiographic features**

Landforms	(1) Ridge (2) Hillslope
Runoff class	Low to high
Flooding frequency	None to rare
Ponding frequency	None
Elevation	5,500–7,000 ft
Slope	0–30%
Aspect	Aspect is not a significant factor

## Climatic features

Annual precipitation ranges between 12 to 15 inches, with about 50 percent coming as snow.

The optimum growing season for native plants is April 15 to July 1. The average temperature of the growing season averages around 55 to 60 degrees Fahrenheit. Winters average around 20 to 25 degrees Fahrenheit. Moisture comes fairly uniform over the months except for November through February which are slightly below that of the others.

**Table 3. Representative climatic features**

Frost-free period (characteristic range)	57-67 days
Freeze-free period (characteristic range)	88-92 days
Precipitation total (characteristic range)	12-15 in
Frost-free period (actual range)	54-75 days
Freeze-free period (actual range)	75-95 days
Precipitation total (actual range)	11-16 in
Frost-free period (average)	62 days
Freeze-free period (average)	90 days
Precipitation total (average)	13 in

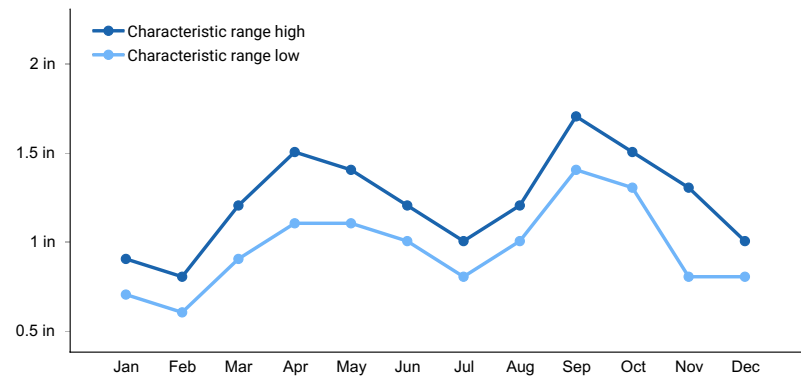


Figure 1. Monthly precipitation range

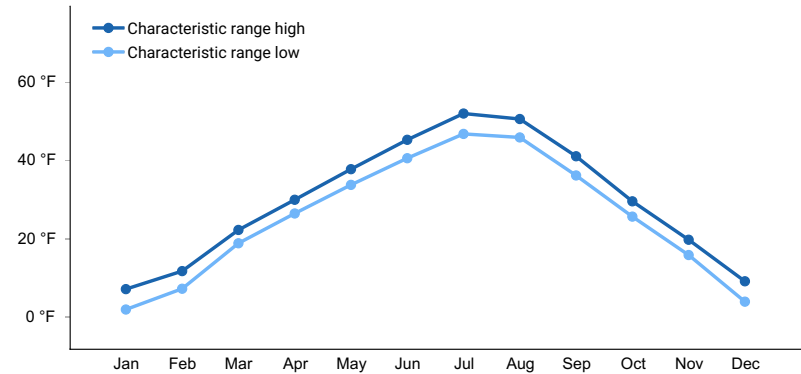


Figure 2. Monthly minimum temperature range

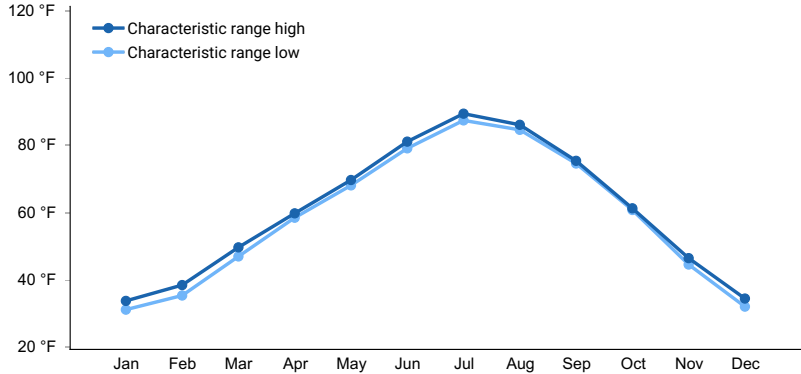
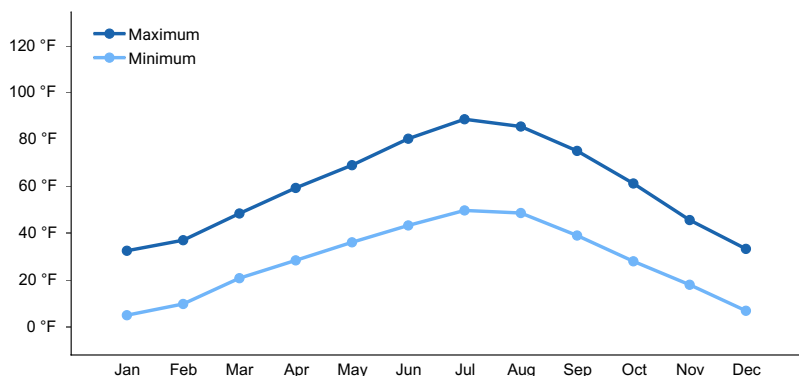
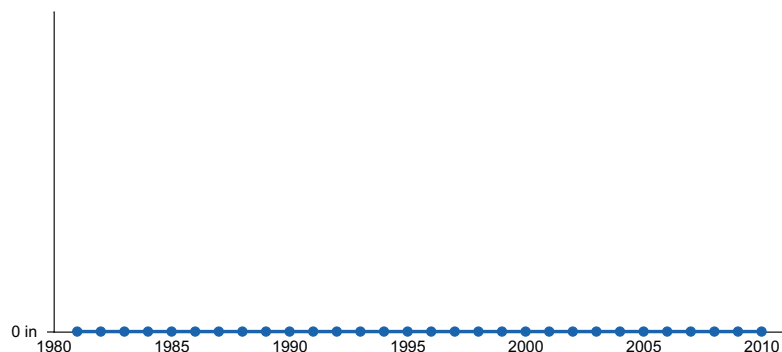


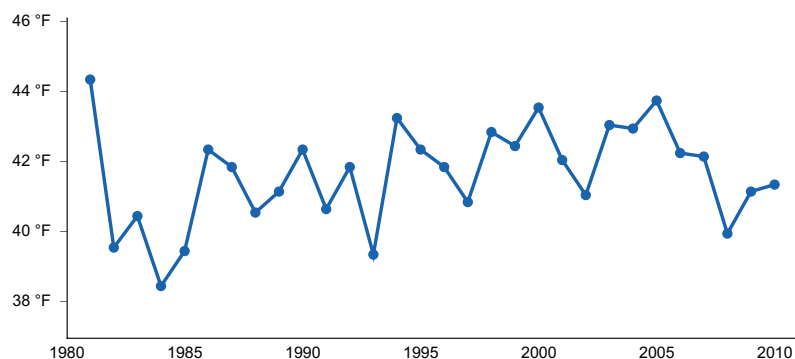
Figure 3. Monthly maximum temperature range



**Figure 4. Monthly average minimum and maximum temperature**



**Figure 5. Annual precipitation pattern**



**Figure 6. Annual average temperature pattern**

## Climate stations used

- (1) MAYBELL [USC00055446], Maybell, CO
- (2) CRAIG MOFFAT CO AP [USW00024046], Craig, CO
- (3) BROWNS PARK STORE [USC00051018], Maybell, CO

## Influencing water features

None

## Wetland description

None

## Soil features

Generally deep medium to moderately coarse textured soils. Dark grayish brown soils with weak to moderate subsoil development. These soils have good water-holding capacity and take water moderately well making them favorable for good plant growth.

Soils in this site include: Hanley gravelly loamy fine sand and Piceance fine sandy loam.

**Table 4. Representative soil features**

Parent material	(1) Alluvium—sandstone and shale (2) Loess
Surface texture	(1) Gravelly loamy fine sand (2) Fine sandy loam
Drainage class	Well drained
Permeability class	Moderately slow to moderately rapid
Soil depth	20–60 in
Surface fragment cover ≤3"	0–10%
Surface fragment cover >3"	0–5%
Available water capacity (0–40in)	3–8 in
Soil reaction (1:1 water) (0–40in)	7.4–8.4
Subsurface fragment volume ≤3" (0–40in)	0–30%
Subsurface fragment volume >3" (0–40in)	0–10%

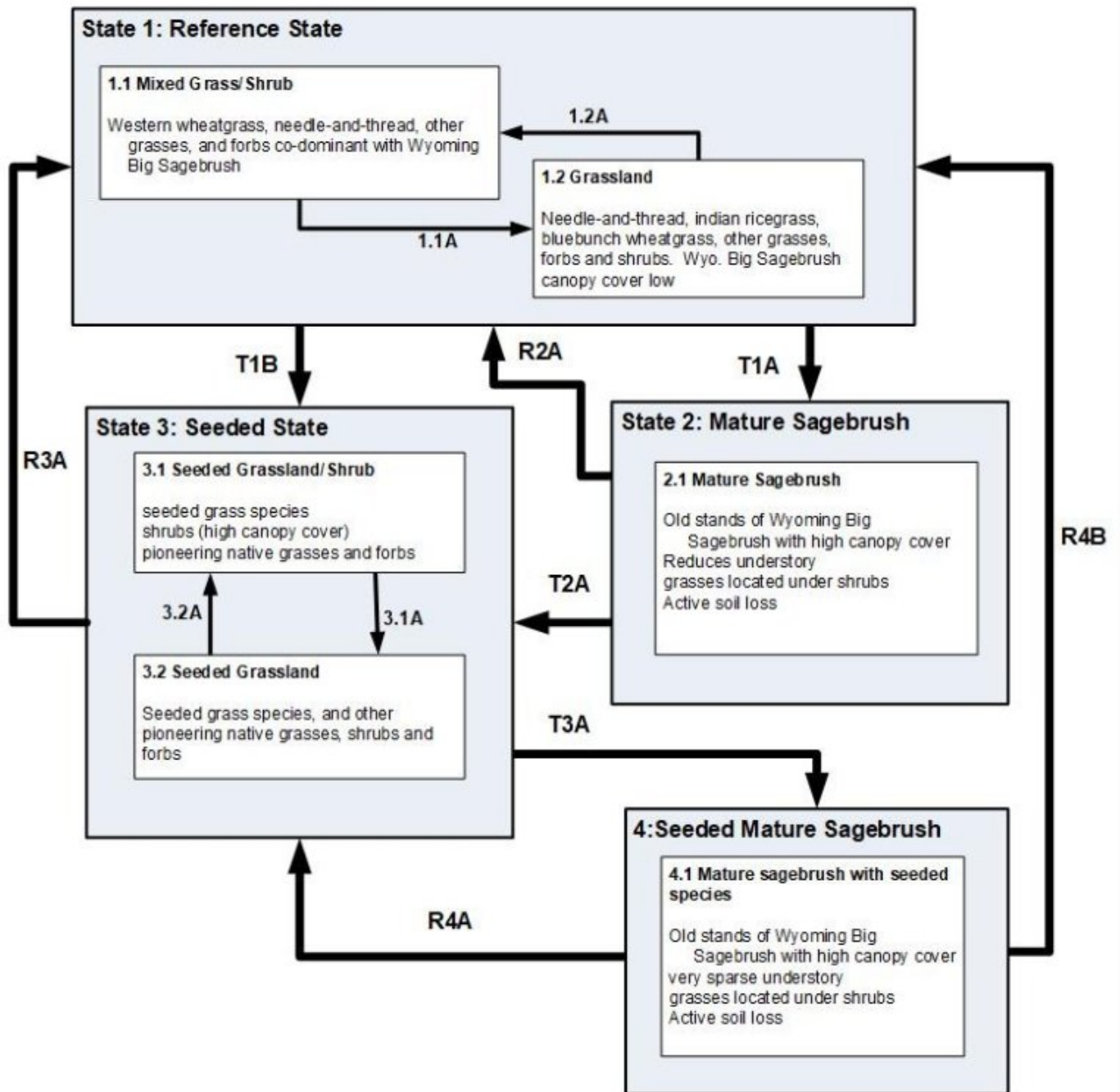
## Ecological dynamics

An open stand of Wyoming big sagebrush with an abundance of grasses including western wheatgrass, bluebunch wheatgrass, needleandthread, squirreltail, bluegrasses and Indian ricegrass. Shrubs, other than big sagebrush are gray horsebrush, low rabbitbrush, tall rabbitbrush, and serviceberry. Principal forbs are American vetch, buckwheats, bluebells, balsamroot, globemallow, lupine, yarrow, and feabane.

This site is treeless.

## State and transition model

## R034AY298CO Rolling Loam



## Legend

1.2A, 3.2A, T1A, T3A – Extended improper grazing, lack of fire, extended drought, time without disturbance, and/or lack of insect/pathogen outbreaks

1.1A, 3.1A, R4A – Fire, proper grazing, wet climatic cycles, vegetative treatments, and/or small scale insect/pathogen outbreaks

T1B, T2A – Seeded herbaceous species planted and/or shrub removal

R2A – fire, vegetation treatments, insect herbivory, drought, proper grazing, wet climatic cycles, and/or encroached shrub removal

R3A – intensive management and inputs maybe required to return to reference state, wet climatic years, native plantings, vegetative treatments, proper grazing and/or fire

State 1  
Reference State

Community 1.1  
Mixed Grass/Shrub

This site supports a plant community of approximately 50 to 70 percent grass/grass like, 10 to 20 percent forbs, and 20 to 30 percent shrubs. Optimum ground cover is 30 percent. Invaders on this site include pinyon pine and Utah juniper. Cheatgrass and other introduced annuals that are not a part of the potential plant community invade when the cover deteriorates. Total Annual Production: Favorable years 1000 lbs/ac air dry Unfavorable years 500 lbs/ac air dry Median years 800 lbs/ac air dry

Table 5. Annual production by plant type

Plant Type	Low (Lb/Acre)	Representative Value (Lb/Acre)	High (Lb/Acre)
Grass/Grasslike	270	480	585
Shrub/Vine	155	200	250
Forb	75	120	165
Total	500	800	1000

Additional community tables

Table 6. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Lb/Acre)	Foliar Cover (%)
<b>Grass/Grasslike</b>					
1				400–560	
	western wheatgrass	PASM	<i>Pascopyrum smithii</i>	120–200	–
	Grass, perennial	2GP	<i>Grass, perennial</i>	80–120	–
	needle and thread	HECOC8	<i>Hesperostipa comata ssp. comata</i>	80–120	–
	Grass-like (not a true grass)	2GL	<i>Grass-like (not a true grass)</i>	0–80	–
	Sandberg bluegrass	POSE	<i>Poa secunda</i>	40–80	–
	bluebunch wheatgrass	PSSP6	<i>Pseudoroegneria spicata</i>	24–40	–
	Indian ricegrass	ACHY	<i>Achnatherum hymenoides</i>	25–40	–
	squirrextail	ELEL5	<i>Elymus elymoides</i>	25–40	–
	prairie Junegrass	KOMA	<i>Koeleria macrantha</i>	25–40	–
<b>Forb</b>					
2				80–160	
	Forb, perennial	2FP	<i>Forb, perennial</i>	0–80	–
	yarrow	ACHIL	<i>Achillea</i>	10–25	–
	onion	ALLIU	<i>Allium</i>	10–25	–
	arrowleaf balsamroot	BASA3	<i>Balsamorhiza sagittata</i>	10–25	–
	daisy	CHRY2	<i>Chrysanthemum</i>	10–25	–
	buckwheat	ERIOG	<i>Eriogonum</i>	10–25	–
	prairie fleabane	ERST3	<i>Erigeron strigosus</i>	10–25	–
	lupine	LUPIN	<i>Lupinus</i>	10–25	–
	bluebells	MERTE	<i>Mertensia</i>	10–25	–
	locoweed	OXYTR	<i>Oxytropis</i>	10–25	–
	phlox	PHLOX	<i>Phlox</i>	10–25	–
	scarlet globemallow	SPCO	<i>Sphaeralcea coccinea</i>	10–25	–
	American vetch	VIAM	<i>Vicia americana</i>	10–25	–
	deathcamas	ZIGAD	<i>Zigadenus</i>	10–25	–
<b>Shrub/Vine</b>					
3				160–240	
	Wyoming big sagebrush	ARTRW8	<i>Artemisia tridentata ssp. wyomingensis</i>	80–120	–
	yellow rabbitbrush	CHVI8	<i>Chrysothamnus viscidiflorus</i>	25–40	–
	spineless horsebrush	TECA2	<i>Tetradymia canescens</i>	25–40	–
	Utah serviceberry	AMUT	<i>Amelanchier utahensis</i>	25–40	–
	plains pricklypear	OPPO	<i>Opuntia polyacantha</i>	0–15	–

## Animal community

### WILDLIFE INTERPRETATIONS:

This site offers a high value rating for antelope, deer, cottontail, jackrabbit, and upland game birds. It offers a medium value rating for elk.

### GRAZING INTERPRETATIONS:



This site offers a high value for cattle sheep and horses.

## Hydrological functions

This site offers a medium value for watershed.

## Recreational uses

Medium value.

## Wood products

None.

## Inventory data references

Information presented here has been derived from NRCS clipping data and other inventory data. Field observations from range trained personnel were also used. Other sources used as references include: USDA NRCS Water and Climate Center, USDA NRCS National Range and Pasture Handbook, and USDA NRCS Soil Surveys from various counties.

## Type locality

Location 1: Moffat County, CO	
General legal description	The open sagebrush areas southwest of the Great Divide, Moffat County, Colorado.

## Other references

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## Contributors

Jim Kellogg

## Approval

Kirt Walstad, 9/07/2023

## Acknowledgments

Field offices in Colorado where the site occurs: Craig, Eagle, Glenwood Springs, Meeker, and Steamboat Springs.

## 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)	J. Murray, C. Holcomb, L. Santana, F. Cummings, S. Jaouen
Contact for lead author	
Date	01/18/2005
Approved by	Kirt Walstad
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

## Indicators

1. **Number and extent of rills:** None to slight on gentle slopes. Rills can be more defined on steeper slopes, especially following intense storms.
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2. **Presence of water flow patterns:** Flow paths should be short and mostly disconnected with debris dams obvious.
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3. **Number and height of erosional pedestals or terracettes:** Pedestals may occur on steeper slopes near or in flow paths.
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4. **Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):** Expect 20-25% bareground. Extended drought can cause bare ground to increase.
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5. **Number of gullies and erosion associated with gullies:** Gullies tend to be infrequent. Possible due to natural disturbance or off-site influence.
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6. **Extent of wind scoured, blowouts and/or depositional areas:** Wind scouring/deposits are possible due to natural

disturbance. Incidences would be infrequent.

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7. **Amount of litter movement (describe size and distance expected to travel):** Litter movement associated with flow paths. Movement expected to be short and minimal.
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8. **Soil surface (top few mm) resistance to erosion (stability values are averages - most sites will show a range of values):** Stability class rating anticipated to be 3-5 in the interspaces at soil surface. Surface soil aggregates should be fairly stable.
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9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** Average SOM is 1-3%. Soils are deep and well-drained. The A-horizon is 0-6 inches in depth or more with a brown to dark brown color. Structure ranges from fine to moderately coarse granular.
- 

10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:** Diverse grass, forb, shrub canopy and root structure reduces raindrop impact and slows overland flow providing increased time for infiltration to occur. Extended drought reduces cool season bunchgrasses causing decreased infiltration and increased runoff following intense storms.
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11. **Presence and thickness of compaction layer (usually none; describe soil profile features which may be mistaken for compaction on this site):** None
- 

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 bunchgrass >

Sub-dominant: cool season rhizomatous grass > (non sprouting) shrubs, = forbs = sprouting shrubs

Other:

Additional:

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13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):** Typically minimal. Expect slight shrub and grass mortality/ decadence during and following drought or lack of disturbance.
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14. **Average percent litter cover (%) and depth ( in):** Litter cover declines during and following extended drought.
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15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):** 500 lbs./ac. low precip years; 800 lbs./ac. average precip years; 1000 lbs./ac. above average precip. years. After extended drought or the first growing season following wildfire, production may be significantly reduced by

200 - 300 lbs./ac. or more.

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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: Cheatgrass, pinyon/juniper and noxious weeds. Big sagebrush is a native increaser on this site.
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17. **Perennial plant reproductive capability:** The only limitations are weather-related, wildfire, natural disease, inter-species competition, wildlife, and insects that may temporarily reduce reproductive capability.
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