

# Ecological site R034AY276WY Very Shallow Foothills and Basins West (VS)

Accessed: 11/24/2024

## 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.

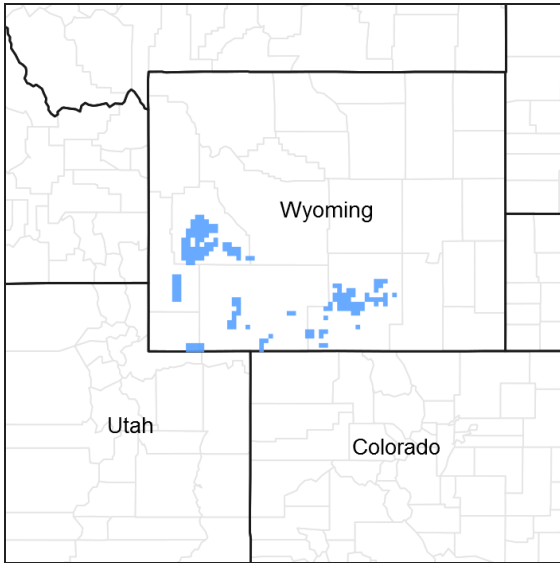


Figure 1. Mapped extent

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.

## Associated sites

R034AY258WY	<b>Shallow Clayey Foothills and Basins West (SwCy)</b> Shallow Clayey
R034AY262WY	<b>Shallow Loamy Foothills and Basins West (SwLy)</b> Shallow Loamy

## Similar sites

R034AY176WY	<b>Very Shallow Green River and Great Divide Basins (VS)</b> Very Shallow (VS) 7-9GR has lower production.
R034AY256WY	<b>Shallow Breaks Foothills and Basins West (SwBr)</b> Shallow Breaks (SwB) 10-14W has higher production and juniper is dominant woody species.

Table 1. Dominant plant species

Tree	Not specified
Shrub	Not specified
Herbaceous	Not specified

## Physiographic features

This site occurs in upland positions with a wide variety of slopes. It is prevalent on wind swept ridges. Most common slopes range from 25 to 50% and elevations are mostly above 7000 feet.

**Table 2. Representative physiographic features**

Landforms	(1) Hill (2) Ridge (3) Escarpment
Flooding frequency	None
Ponding frequency	None
Elevation	1,981–2,286 m
Slope	1–70%
Ponding depth	0 cm
Aspect	Aspect is not a significant factor

## Climatic features

Annual precipitation ranges from 10-14 inches per year. Wide fluctuations may occur in yearly precipitation and result in more dry years than those with more than normal precipitation. Temperatures show a wide range between summer and winter and between daily maximums and minimums. This is predominantly due to the high elevation and dry air, which permits rapid incoming and outgoing radiation. Cold air outbreaks in winter move rapidly from northwest to southeast and account for extreme minimum temperatures. Extreme storms may occur during the winter, but most severely affect ranch operations during late winter and spring.

Daytime winds are generally stronger than nighttime and occasional strong storms may bring brief periods of high winds with gusts to more than 50 mph.

Growth of native cool season plants begins about April 15 and continues to about August 15. Some green up of cool season plants usually occurs in September depending upon fall moisture occurrences.

The following information is from the "Pinedale" climate station:

Minimum Maximum 5 yrs. out of 10 between

Frost-free period (days): 18 67 July 5 – August 15

Freeze-free period (days): 53 97 June 15 – August 24

Annual Precipitation (inches): <7.18 >13.94 (2 years in 10)

Average annual precipitation: 11.29 inches

Average annual air temperature: 35.9 F (20.4 F Avg. Min. to 51.4 F Avg. Max.)

For detailed information visit the Natural Resources Conservation Service National Water and Climate Center at <http://www.wcc.nrcs.usda.gov/cgibin/state.pl?state=wy> website. Other climate stations representative of this precipitation zone include "Border 3 N" and Kemmerer Wtr Trtmt" in Lincoln County; "Evanston 1 E" in Uinta County; and "Merna" in Sublette County.

**Table 3. Representative climatic features**

Frost-free period (average)	67 days
Freeze-free period (average)	97 days
Precipitation total (average)	356 mm

## Influencing water features

### Soil features

Soils of this site are generally less than 10 inches deep, but this site will include areas of exposed bedrock and pockets of deep soil. Coarse fragment content is typically 30-60% throughout the profile, including the surface.

Major Soil Series correlated to this site include: Cragosen, Quealy, Starman and some phases of the Rentsac series.

Other Soil Series in MLRA 34A correlated to this site include: Spool, Rockinchair, Rootel, Rencot, Barrett, Brownsto, Highams, Redwash, and some phases of the Blazon and Wiscow series.

**Table 4. Representative soil features**

Surface texture	(1) Gravelly sandy loam (2) Channery fine sandy loam (3) Flaggy loam
Family particle size	(1) Loamy
Drainage class	Well drained to excessively drained
Permeability class	Moderately slow to rapid
Soil depth	10–25 cm
Surface fragment cover ≤3"	10–40%
Surface fragment cover >3"	0–30%
Available water capacity (0-101.6cm)	1.78–3.81 cm
Calcium carbonate equivalent (0-101.6cm)	0–15%
Electrical conductivity (0-101.6cm)	0–4 mmhos/cm
Sodium adsorption ratio (0-101.6cm)	0–5
Soil reaction (1:1 water) (0-101.6cm)	6.6–8.4
Subsurface fragment volume ≤3" (Depth not specified)	10–40%
Subsurface fragment volume >3" (Depth not specified)	10–30%

### Ecological dynamics

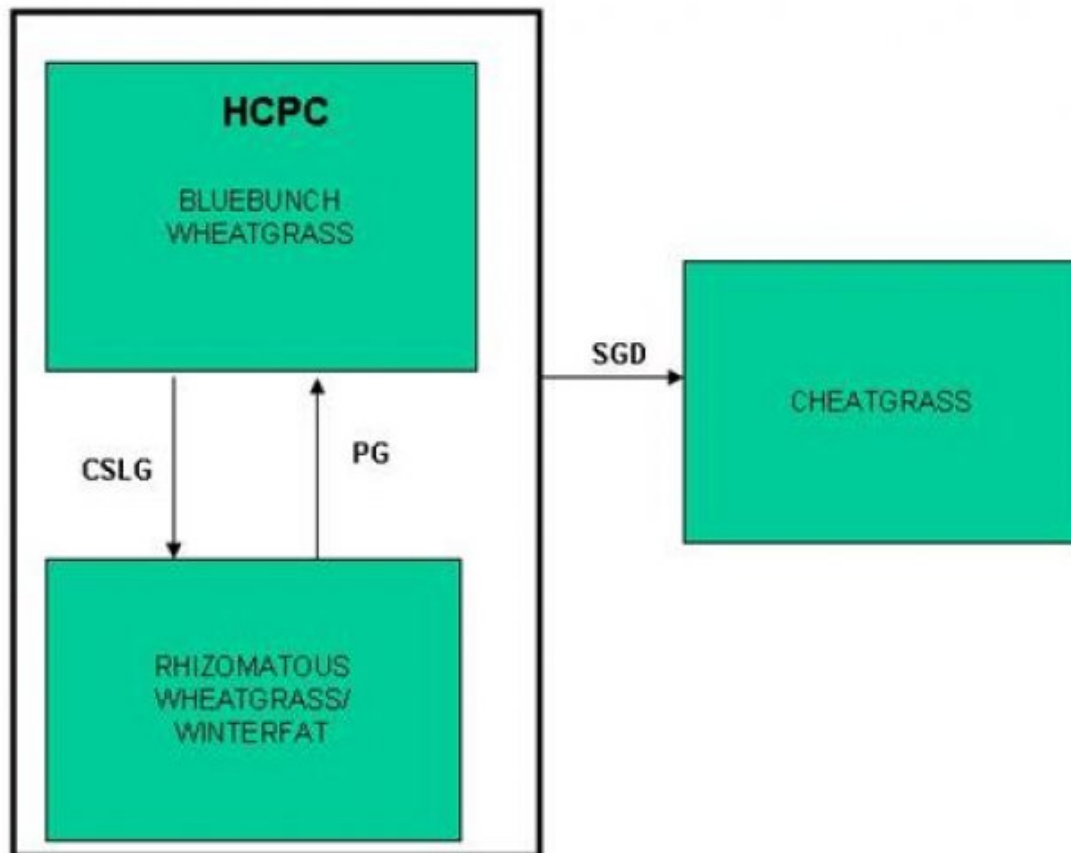
As this site deteriorates, species such as green rabbitbrush will increase. Cool season bunchgrasses such as bluebunch wheatgrass, Indian ricegrass, and needleandthread will decrease in frequency and production. Cheatgrass often invades. This site has relatively low productivity potential, and is not well suited to grazing improvement practices unless treated as part of a larger unit containing more productive areas.

The Historic Climax Plant Community (description follows the plant community diagram) has been determined by study of rangeland relic areas, or areas protected from excessive disturbance. Trends in plant communities going from heavily grazed areas to lightly grazed areas, seasonal use pastures, and historical accounts have also been used.

The following is a State and Transition Model Diagram that illustrates the common plant communities (states) that

can occur on the site and the transitions between these communities. The ecological processes will be discussed in more detail in the plant community narratives following the diagram.

## **State and transition model**



BMA – Brush Management (all methods)  
BMC – Brush Management (chemical)  
BMF – Brush Management (fire)  
BMM – Brush Management (mechanical)  
CSP – Chemical Seedbed Preparation  
CSLG – Continuous Season-long Grazing  
DR – Drainage  
CSG – Continuous Spring Grazing  
HB – Heavy Browse  
HCSLG – Heavy Continuous Season-long Grazing  
HI – Heavy Inundation  
LPG – Long-term Prescribed Grazing  
MT – Mechanical Treatment (chiseling, ripping, pitting)

NF – No Fire  
NS – Natural Succession  
NWC – Noxious Weed Control  
NWI – Noxious Weed Invasion  
NU – Nonuse  
P&C – Plow & Crop (including hay)  
PG – Prescribed Grazing  
RPT – Re-plant Trees  
RS – Re-seed  
SGD – Severe Ground Disturbance  
SHC – Severe Hoof Compaction  
WD – Wildlife Damage (Beaver)  
WF – Wildfire

**State 1**  
**Bluebunch Wheatgrass Plant Community (HCPC)**

**Community 1.1**  
**Bluebunch Wheatgrass Plant Community (HCPC)**

The interpretive plant community for this site is the Historic Climax Plant Community. Potential vegetation is estimated at 65% grasses or grass-like plants, 10% forbs, and 25% woody plants. The major grasses include bluebunch wheatgrass, rhizomatous wheatgrass, Indian ricegrass, and bottlebrush squirreltail. Other grasses include Sandberg, Canby, and mutton bluegrass, prairie junegrass, Letterman needlegrass, needleleaf sedge, and needleandthread. At higher elevations, juniper may occur as the dominant woody plant. Other woody plants may include black, big, and low sagebrush, green rabbitbrush, bitterbrush, winterfat, and skunkbush sumac. A typical plant composition for this state consists of bluebunch wheatgrass 20-35%, rhizomatous wheatgrass 5-15%, Indian ricegrass 5-15%, bottlebrush squirreltail 5-10%, other grasses and grass-like plants 5-15%, perennial forbs 5-15%, juniper 1-10%, and 5-15% other woody plants. When this occurs at lower elevations and on windswept ridges, the woody component may lean toward winterfat or be absent. Ground cover, by ocular estimate, varies from 20-30%. The total annual production (air-dry weight) of this state is about 350 pounds per acre, but it can range from about 200 lbs./acre in unfavorable years to about 500 lbs./acre in above average years. The state is stable and well adapted to the Cool Central Desertic Basins and Plateaus climatic conditions. The diversity in plant species allows for high drought resistance. This is a sustainable plant community (site/soil stability, watershed function, and biologic integrity Transitions or pathways leading to other plant communities are as follows: • Severe Ground Disturbance will convert this plant community to the Cheatgrass State. • Continuous Season-long Grazing will convert the plant community to the Rhizomatous Wheatgrass/Winterfat State.

Figure 4. Plant community growth curve (percent production by month). WY0301, 34AC, Upland Sites. All Upland Sites.

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
			5	40	50			5			

**State 2**  
**Rhizomatous Wheatgrass/Winterfat Plant Community**

**Community 2.1**  
**Rhizomatous Wheatgrass/Winterfat Plant Community**

This plant community is a result of frequent and severe grazing. The stand is composed of almost entirely rhizomatous wheatgrass and winterfat with such forbs as phlox and goldenweed present as well. This state is commonly found on exposed, windswept ridges that are subject to harsh climatic conditions as well as severe winter use due to their exposed nature. The total annual production (air-dry weight) of this state is about 250 pounds per acre, but it can range from about 150 lbs./acre in unfavorable years to about 400 lbs./acre in above average years. The state is stable and protected from excessive erosion. The biotic integrity of this plant community is usually intact, however forage value will decrease and wildlife values will shift toward different species. The watershed is functioning. Transitional pathways leading to other plant communities are as follows: • Severe Ground Disturbance will convert this plant community to the Cheatgrass State. • Prescribed Grazing will return this state to near Historic Climax Plant Community (Bluebunch Wheatgrass State).

Figure 5. Plant community growth curve (percent production by month). WY0301, 34AC, Upland Sites. All Upland Sites.

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
			5	40	50			5			

**State 3**  
**Cheatgrass Plant Community**

**Community 3.1**

## Cheatgrass Plant Community

This plant community is a result of severe ground disturbance either with or without improper grazing use. Green rabbitbrush, fringed sagewort, cheatgrass, and annual forbs are significant components of this plant community. The total annual production (air-dry weight) of this state is about 150 pounds per acre, but it can range from about 50 lbs./acre in unfavorable years to about 300 lbs./acre in above average years. The state is unstable and vulnerable to excessive erosion. The biotic integrity of this plant community is at risk depending on how far a shift has occurred in plant composition toward cheatgrass and annual forbs. The watershed is usually at risk or nonfunctioning due to an increase in bare ground. Transitional pathways leading to other plant communities are as follows: It is not often practicable or economically feasible to convert this plant community at the present time.

Figure 6. Plant community growth curve (percent production by month). WY0301, 34AC, Upland Sites. All Upland Sites.

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
			5	40	50			5			

## Additional community tables

Table 5. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Kg/Hectare)	Foliar Cover (%)
<b>Grass/Grasslike</b>					
1				78–138	
	Montana wheatgrass	ELAL7	<i>Elymus albicans</i>	78–138	–
	bluebunch wheatgrass	PSSP6	<i>Pseudoroegneria spicata</i>	78–138	–
2				20–59	
	Indian ricegrass	ACHY	<i>Achnatherum hymenoides</i>	20–59	–
3				20–59	
	western wheatgrass	PASM	<i>Pascopyrum smithii</i>	20–59	–
4				20–39	
	squirreltail	ELEL5	<i>Elymus elymoides</i>	20–39	–
5				20–59	
	Grass, perennial	2GP	<i>Grass, perennial</i>	0–20	–
	Letterman's needlegrass	ACLE9	<i>Achnatherum lettermanii</i>	0–20	–
	threeawn	ARIST	<i>Aristida</i>	0–20	–
	needleleaf sedge	CADU6	<i>Carex duriuscula</i>	0–20	–
	plains reedgrass	CAMO	<i>Calamagrostis montanensis</i>	0–20	–
	needle and thread	HECO26	<i>Hesperostipa comata</i>	0–20	–
	prairie Junegrass	KOMA	<i>Koeleria macrantha</i>	0–20	–
	muttongrass	POFE	<i>Poa fendleriana</i>	0–20	–
	Sandberg bluegrass	POSE	<i>Poa secunda</i>	0–20	–
<b>Forb</b>					
6				20–59	
	Forb, perennial	2FP	<i>Forb, perennial</i>	0–20	–
	yarrow	ACHIL	<i>Achillea</i>	0–20	–
	rosy pussytoes	ANRO2	<i>Antennaria rosea</i>	0–20	–
	sandwort	ARENA	<i>Arenaria</i>	0–20	–
	milkvetch	ASTRA	<i>Astragalus</i>	0–20	–
	Indian paintbrush	CAST12	<i>Castilleja</i>	0–20	–

	Common Name	Code	Scientific Name	Height	Notes
	pale bastard toadflax	COUMP	<i>Comandra umbellata ssp. pallida</i>	0–20	–
	tapertip hawksbeard	CRAC2	<i>Crepis acuminata</i>	0–20	–
	fleabane	ERIGE2	<i>Erigeron</i>	0–20	–
	buckwheat	ERIOG	<i>Eriogonum</i>	0–20	–
	aster	EUCEP2	<i>Eucephalus</i>	0–20	–
	granite prickly phlox	LIPU11	<i>Linanthus pungens</i>	0–20	–
	desertparsley	LOMAT	<i>Lomatium</i>	0–20	–
	beardtongue	PENST	<i>Penstemon</i>	0–20	–
	spiny phlox	PHHO	<i>Phlox hoodii</i>	0–20	–
	buttercup	RANUN	<i>Ranunculus</i>	0–20	–
	stonecrop	SEDUM	<i>Sedum</i>	0–20	–
	stemless mock goldenweed	STAC	<i>Stenotus acaulis</i>	0–20	–
	clover	TRIFO	<i>Trifolium</i>	0–20	–
	violet	VIOLA	<i>Viola</i>	0–20	–
<b>Shrub/Vine</b>					
8				4–39	
	Rocky Mountain juniper	JUSC2	<i>Juniperus scopulorum</i>	4–39	–
9				20–59	
	little sagebrush	ARAR8	<i>Artemisia arbuscula</i>	0–20	–
	black sagebrush	ARNO4	<i>Artemisia nova</i>	0–20	–
	big sagebrush	ARTR2	<i>Artemisia tridentata</i>	0–20	–
	yellow rabbitbrush	CHVI8	<i>Chrysothamnus viscidiflorus</i>	0–20	–
	winterfat	KRLA2	<i>Krascheninnikovia lanata</i>	0–20	–
	antelope bitterbrush	PUTR2	<i>Purshia tridentata</i>	0–20	–
	skunkbush sumac	RHTR	<i>Rhus trilobata</i>	0–20	–

## Animal community

### Animal Community – Wildlife Interpretations

Bluebunch Wheatgrass Plant Community (HCPC): When blown clear, this plant community provides limited winter forage for large grazers when snow depth prevents foraging on other sites. Otherwise, it is mostly used by wildlife in transit to other habitats. When found proximal to taller sagebrush, these sites can be suitable sage grouse lek locations.

Rhizomatous Wheatgrass/Winterfat Plant Community: This plant community may be useful for the same wildlife that would use the Historic Climax Plant Community. However, the plant community composition is less diverse, and thus, less apt to meet the seasonal needs of these animals.

Cheatgrass Plant Community: This plant community exhibits a low level of plant species diversity. It is not a desirable plant community to select as a wildlife habitat management objective.

### Animal Community – Grazing Interpretations

The following table lists suggested stocking rates for cattle under continuous season-long grazing under normal growing conditions. 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 (as 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 this 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 Carrying Capacity\*

(lb./ac) (AUM/ac)

Bluebunch Wheatgrass (HCPC) 200-500 .11

Rhizomatous Wheatgrass/Winterfat 150-400 .07

Cheatgrass 50-300 .03

\* - Continuous, season-long grazing by cattle under average growing conditions.

Grazing by domestic livestock is one of the major income-producing industries in the area. Rangeland in this area may provide yearlong forage for cattle, sheep, or horses. During the dormant period, the forage for livestock use needs to be supplemented with protein because the quality does not meet minimum livestock requirements.

### Hydrological functions

Water and soil depth are the principal factors limiting forage production on this site. This site is dominated by soils in hydrologic group C and D. Infiltration ranges from very slow to slow. Runoff potential for this site varies from moderate to high depending on soil hydrologic group, depth and fracturing of bedrock, slope, and ground cover (refer to Part 630, NRCS National Engineering Handbook for detailed hydrology information).

Rills and gullies may be present, but should be small. Water flow patterns should be barely distinguishable. Pedestals are only slightly present in association with bunchgrasses such as bluebunch wheatgrass. Litter typically falls in place, and signs of movement are not common. Chemical and physical crusts are rare to non-existent. Cryptogammic crusts are present, but only cover 1-2% of the soil surface.

### Recreational uses

This site provides hunting opportunities for upland game species. Wildflowers that bloom throughout the growing season have esthetic values that appeal to visitors.

### Wood products

No appreciable wood products are present on the site.

### Other products

None noted.

### Inventory data references

Inventory Data References (narrative)

Information presented here has been derived from NRCS clipping data and other inventory data. Field observations from range trained personnel were also used. Those involved in developing this site include: Bill Christensen, Range Management Specialist, NRCS; Karen Clause, Range Management Specialist, NRCS; and Everet Bainter, Range Management Specialist, NRCS. 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.

Inventory Data References

Data Source Number of Records Sample Period State County  
SCS-RANGE-417 15 1966-1988 WY Sublette & others

## Contributors

K. Clause

## 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.

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Date	03/15/2007
Approved by	E. Bainter
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

## Indicators

- 1. Number and extent of rills:** Some rills to be expected on this site. Depending on slope, rills range from .5-2 inches (1-5 cm) wide and are found every 3-6 feet (1-2 m).

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- 2. Presence of water flow patterns:** Some observable.

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- 3. Number and height of erosional pedestals or terracettes:** Slight pedestalling evident.

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- 4. Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):** Bare ground can range from 30-60%.

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- 5. Number of gullies and erosion associated with gullies:** Active gullies, where present, should be rare.

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- 6. Extent of wind scoured, blowouts and/or depositional areas:** Minimal to nonexistent.

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- 7. Amount of litter movement (describe size and distance expected to travel):** Herbaceous litter expected to move in moderate amounts. Large woody debris will show only slight movement down slope.

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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):** Soil Stability Index ratings range from 1 (interspaces) to 6 (under plant canopy), but average values should be 2.5 or greater.

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9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** Currently no soil series are correlated to this ecological site. Soil OM of less than 1% is expected.
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10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:** Plant community consists of 60-80% grasses, 15% forbs, and 5-25% shrubs. Sparse plant canopy (20-60%) and litter, steep slopes, plus slow to moderate infiltration rates result in slight to moderate runoff. Basal cover is typically less than 5% and does very little to effect runoff on this site. Bedrock outcropping provides stability to the site, but reduces infiltration.
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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):** No compaction layer exists, but shallow depth to and exposed bedrock may be mistaken for a compaction layer.
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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:
- Sub-dominant:
- Other:
- Additional: No compaction layer exists, but shallow depth to and exposed bedrock may be mistaken for a compaction layer.
- 
13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):** Minimal decadence, typically associated with shrub component.
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14. **Average percent litter cover (%) and depth ( in):** Litter ranges from 5-20% of total canopy measurement with total litter (including beneath the plant canopy) from 15-50% expected. Herbaceous litter depth is typically shallow, ranging from 2-8 mm. Woody litter can be up to several inches (>8 cm).
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15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):** English: 200-500 lb/ac (350 lb/ac average); Metric: 224-560 kg/ha (392 kg/ha average).
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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:** Bare ground greater than 75% and the presence of cheatgrass are the most common indicators of a threshold being crossed. Rabbitbrush, Sandberg bluegrass, and phlox are common increasers. Annual weeds such

as cheatgrass, mustards, kochia, and Russian thistle are common invasive species in disturbed sites.

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17. **Perennial plant reproductive capability:** All species are capable of reproducing, except in drought years.
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