

## Ecological site R029XY021NV LOAMY HILL 5-8 P.Z.

Accessed: 05/03/2024

### 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.

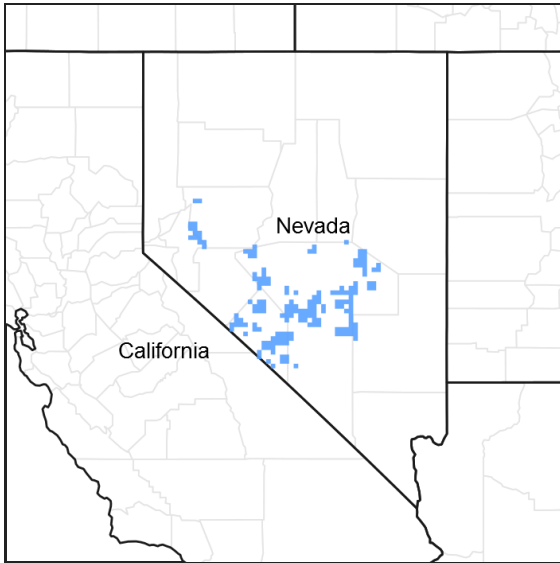


Figure 1. Mapped extent

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

R029XY014NV	<b>SHALLOW CALCAREOUS SLOPE 8-12 P.Z.</b>
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### Similar sites

R029XY031NV	<b>SHALLOW DROUGHTY LOAM 5-8 P.Z.</b> GRSP-MESP2 codominant shrubs; more productive site
R029XY022NV	<b>LOAMY SLOPE 5-8 P.Z.</b> ATCO dominant shrub; GRSP & LYAN minor shrubs
R029XY033NV	<b>LOAMY SLOPE 3-5 P.Z.</b> Less productive site; ATCO dominant shrub; GRSP & LYAN minor shrubs
R029XY016NV	<b>LOAMY UPLAND 5-8 P.Z.</b> More productive site; GRSP-EPNE codominant
R029XY079NV	<b>DROUGHTY LOAM 5-8 P.Z.</b> More productive site; GRSP-EPNE codominant shrubs; ACHY-ACSP12 codominant grasses

Table 1. Dominant plant species

Tree	Not specified
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Shrub	(1) <i>Grayia spinosa</i> (2) <i>Lycium andersonii</i>
Herbaceous	(1) <i>Achnatherum hymenoides</i> (2) <i>Pleuraphis jamesii</i>

## Physiographic features

This site occurs on summits and sideslopes of hills and mountains on all exposures. Slopes range from 2 to over 75 percent, but slope gradients of 30 to 50 percent are typical. Elevations are 4200 to about 7000 feet.

**Table 2. Representative physiographic features**

Landforms	(1) Mountain (2) Hill
Elevation	1,280–2,134 m
Slope	2–75%
Aspect	Aspect is not a significant factor

## Climatic features

Average annual precipitation is 5 to 8 inches. Mean annual air temperature is 52 to 58 degrees F. The average growing season is about 140 to 200 days.

**Table 3. Representative climatic features**

Frost-free period (average)	200 days
Freeze-free period (average)	0 days
Precipitation total (average)	203 mm

## Influencing water features

There are no influencing water features associated with this site.

## Soil features

The soils associated with this site have a shallow effective rooting zone with depth to a hardpan or bedrock ranging from 5 to 20 inches. These soils have high gravel volumes throughout the soil profile. The available water capacity is very low. Soil fertility is low. The soil surface typically has 75 percent or more rock fragments that occupy plant-growing space yet help to reduce evaporation and conserve soil moisture. Runoff is moderate to rapid. Rock fragments on the soil surface provide a stabilizing affect on surface erosion conditions. Soil series associated with this site are Tolicha and Vindicator.

**Table 4. Representative soil features**

Surface texture	(1) Gravelly sandy loam (2) Very stony very fine sandy loam (3) Gravelly sandy loam
Family particle size	(1) Loamy
Drainage class	Well drained to somewhat excessively drained
Permeability class	Moderate to moderately rapid
Soil depth	10–36 cm
Surface fragment cover <=3"	23–52%

Surface fragment cover >3"	2–40%
Available water capacity (0-101.6cm)	1.02–3.81 cm
Calcium carbonate equivalent (0-101.6cm)	0–5%
Electrical conductivity (0-101.6cm)	0–2 mmhos/cm
Sodium adsorption ratio (0-101.6cm)	0–5
Soil reaction (1:1 water) (0-101.6cm)	7.4–9
Subsurface fragment volume <=3" (Depth not specified)	19–50%
Subsurface fragment volume >3" (Depth not specified)	3–40%

## Ecological dynamics

As ecological condition declines, littleleaf horsebrush, Douglas rabbitbrush, and Anderson wolfberry increase. Species likely to invade this site are annuals such as brome grasses, Russian thistle and mustards.

### Fire Ecology:

The mean fire return interval for salt-desert shrub communities ranges from 35 to 100 years. Increased presence of non-native annual grasses, such as cheatgrass, can alter fire regimes by increasing fire frequency under wet to near-normal summer moisture conditions. When fire does occur, the effect on the ecosystem may be extreme. Fires in spiny hopsage sites generally occur in late summer when plants are dormant, and sprouting generally does not occur until the following spring. Spiny hopsage is considered to be somewhat fire tolerant and often survives fires that kill sagebrush. Mature spiny hopsage generally sprout after being burned. Spiny hopsage is reported to be least susceptible to fire during summer dormancy. Fire typically destroys aboveground parts of wolfberry, but the degree of damage to the plant depends on fire severity. Communities in which Nevada dalea occur rarely burn, thus Nevada dalea has little adaptations to fire and is probably killed. Budsage is killed by fire. Indian ricegrass can be killed by fire, depending on severity and season of burn. Indian ricegrass reestablishes on burned sites through seed dispersed from adjacent unburned areas. Galleta is a rhizomatous perennial which can resprout after top-kill by fire. Desert needlegrass has persistent dead leaf bases, which make it susceptible to burning. Fire removes the accumulation; a rapid, cool fire will not burn deep into the root crown. Most perennial grasses have root crowns that can survive wildfire.

## State and transition model

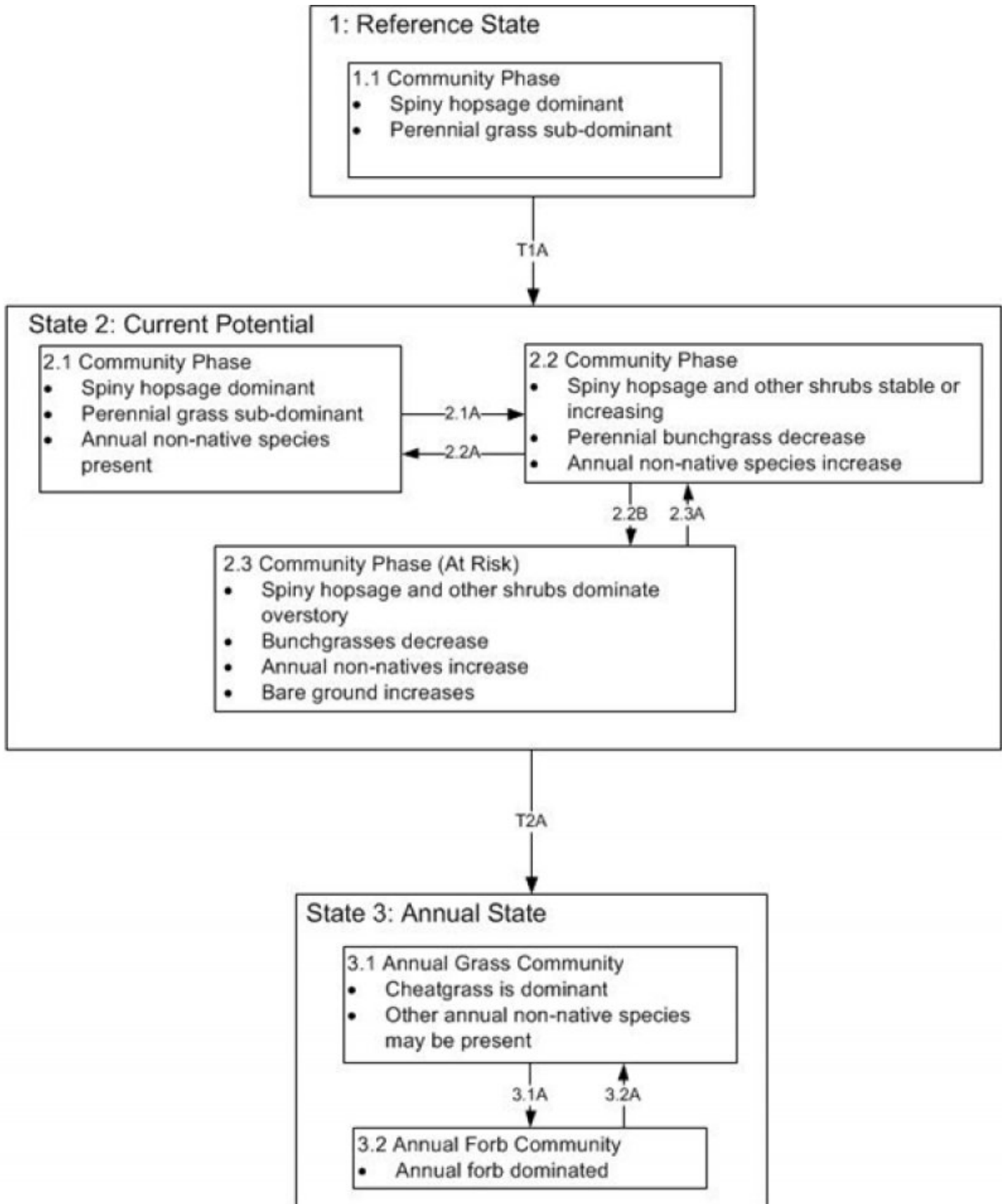


Figure 3. DRAFT STM

## T1A: introduction of non-native species

2.1A: prolonged drought/ inadequate rest and recovery from defoliation

2.2A: rest and recovery

2.2B: prolonged drought/ inadequate rest and recovery from defoliation

2.3A: recovery or changes in management

T2A: Inadequate rest and recovery from defoliation and/or prolonged drought/Catastrophic wildfire.

3.1A: fire or cheatgrass die off

3.2A: time

Figure 4. DRAFT STM LEGEND

### State 1

#### Reference State

#### Community 1.1

##### Reference Plant Community

The reference plant community is dominated by spiny hopsage, Anderson's wolfberry and Indian ricegrass. Other important species on this site are Nevada dalea and galleta. Potential vegetative composition is about 40% grasses, 5% forbs and 55% shrubs. Approximate ground cover (basal and crown) is less than 10 percent.

Table 5. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Shrub/Vine	62	123	185
Grass/Grasslike	45	90	135
Forb	6	11	17
<b>Total</b>	<b>113</b>	<b>224</b>	<b>337</b>

### State 2

#### Current Potential

### State 3

#### Annual State

#### Additional community tables

Table 6. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Kg/Hectare)	Foliar Cover (%)
<b>Grass/Grasslike</b>					
1	<b>Primary Perennial Grasses</b>			27–67	
	Indian ricegrass	ACHY	<i>Achnatherum hymenoides</i>	11–34	–
	James' galleta	PLJA	<i>Pleuraphis jamesii</i>	11–22	–
	desert needlegrass	ACSP12	<i>Achnatherum speciosum</i>	4–11	–
2	<b>Secondary Perennial Grasses</b>			4–22	
	King's eyelashgrass	BLKI	<i>Blepharidachne kingii</i>	1–7	–
	squirreltail	ELEL5	<i>Elymus elymoides</i>	1–7	–
	sand dropseed	SPCR	<i>Sporobolus cryptandrus</i>	1–7	–
<b>Forb</b>					
3	<b>Perennial</b>			4–18	
	King's eyelashgrass	BLKI	<i>Blepharidachne kingii</i>	1–6	–
	sand dropseed	SPCR	<i>Sporobolus cryptandrus</i>	1–6	–
	globemallow	SPHAE	<i>Sphaeralcea</i>	1–4	–
	princesplume	STANL	<i>Stanleya</i>	1–4	–
4	<b>Annual</b>			0–11	
<b>Shrub/Vine</b>					
5	<b>Primary Shrubs</b>			38–101	
	spiny hopsage	GRSP	<i>Grayia spinosa</i>	11–34	–
	Nevada dalea	PSPO	<i>Psoralea polydenius</i>	11–22	–
	water jacket	LYAN	<i>Lycium andersonii</i>	3–11	–
	rabbit thorn	LYPAO	<i>Lycium pallidum</i> var. <i>oligospermum</i>	4–11	–
	Shockley's desert-thorn	LYSH	<i>Lycium shockleyi</i>	3–11	–
	bud sagebrush	PIDE4	<i>Picrothamnus desertorum</i>	4–11	–
	Forb, annual	2FA	<i>Forb, annual</i>	0–11	–
6	<b>Secondary Shrubs</b>			11–45	
	fourwing saltbush	ATCA2	<i>Atriplex canescens</i>	1–11	–
	shadscale saltbush	ATCO	<i>Atriplex confertifolia</i>	1–11	–
	yellow rabbitbrush	CHVI8	<i>Chrysothamnus viscidiflorus</i>	1–11	–
	Nevada jointfir	EPNE	<i>Ephedra nevadensis</i>	1–11	–
	winterfat	KRLA2	<i>Krascheninnikovia lanata</i>	1–11	–
	spiny menodora	MESP2	<i>Menodora spinescens</i>	1–11	–

## Animal community

### Livestock Interpretations:

This site is suited to livestock grazing. Grazing management should be keyed to Indian ricegrass, galleta, and all other perennial grass production. Indian ricegrass is highly palatable to all classes of livestock in both green and cured condition. It supplies a source of green feed before most other native grasses have produced much new growth. When actively growing, galleta provides good to excellent forage for cattle and horses and fair forage for domestic sheep. Although not preferred, all classes of livestock may use galleta when it is dry. Domestic sheep show greater use in winter than summer months and typically feed upon central portions of galleta tufts, leaving coarser growth around the edges. Galleta may prove somewhat coarse to domestic sheep. Young desert

needlegrass is palatable to all classes of livestock. Mature herbage is moderately grazed by horses and cattle, but rarely grazed by sheep. Spiny hopsage provides a palatable and nutritious food source for livestock, particularly during late winter through spring. Domestic sheep browse the succulent new growth of spiny hopsage in late winter and early spring. Wolfberry is sometimes used as forage by livestock. Palatability of wolfberry browse is presumably fair to low. This species is used as forage only when more desirable species are unavailable. The fruit, however, appears to be moderately palatable. Nevada dalea is of little importance to livestock due to its low palatability. Budsage is palatable and nutritious forage for domestic sheep in the winter and spring although it is known to cause mouth sores in lambs. Budsage can be poisonous or fatal to calves when eaten in quantity. Budsage, while desired by cattle in spring, is poisonous to cattle when consumed alone.

Stocking rates vary over time depending upon season of use, climate variations, site, and previous and current management goals. A safe starting stocking rate is an estimated stocking rate that is fine tuned by the client by adaptive management through the year and from year to year.

#### Wildlife Interpretations:

Spiny hopsage provides a palatable and nutritious food source for big game animals. Spiny hopsage is used as forage to at least some extent by domestic goats, deer, pronghorn, and rabbits. Palatability of wolfberry browse is presumably fair to low. This species is used as forage only when more desirable species are unavailable. The fruit, however, appears to be moderately palatable. Wolfberry is sometimes used as forage by feral burros. The red berries are eaten by some birds and mammals. Berries of this plant constituted 2 percent of the diet of chukar partridges. In some areas of southern Nevada, the fleshy leaves and juicy berries provide part of the succulence permitting Gambel quail to occupy desert areas devoid of drinking water. In desert washes wolfberry grows in dense thorny thickets which provide good cover for quail and other small wildlife. Nevada dalea has low palatability to many wildlife species. Budsage is palatable, nutritious forage for upland game birds, small game and big game in winter. Budsage is rated as "regularly, frequently, or moderately taken" by mule deer in Nevada in winter and is utilized by bighorn sheep in summer, but the importance of budsage in the diet of bighorns is not known. Bud sage comprises 18 – 35% of a pronghorn's diet during the spring where it is available. Chukar will utilize the leaves and seeds of bud sage. Budsage is highly susceptible to effects of browsing. It decreases under browsing due to year-long palatability of its buds and is particularly susceptible to browsing in the spring when it is physiologically most active. Indian ricegrass is eaten by pronghorn in "moderate" amounts whenever available. In Nevada it is consumed by desert bighorns. A number of heteromyid rodents inhabiting desert rangelands show preference for seed of Indian ricegrass. Indian ricegrass is an important component of jackrabbit diets in spring and summer. In Nevada, Indian ricegrass may even dominate jackrabbit diets during the spring through early summer months. Indian ricegrass seed provides food for many species of birds. Doves, for example, eat large amounts of shattered Indian ricegrass seed lying on the ground. Galleta provides moderately palatable forage when actively growing and relatively unpalatable forage during dormant periods. Galleta provides poor cover for most wildlife species. Young desert needlegrass is palatable to many species of wildlife. Desert needlegrass produces considerable basal foliage and is good forage while young. Desert bighorn sheep graze desert needlegrass.

### Hydrological functions

Runoff is very high. Permeability is moderate to moderately rapid. Drainage is well to somewhat excessively

### Recreational uses

Aesthetic value is derived from the diverse floral and faunal composition and the colorful flowering of wild flowers and shrubs during the spring and early summer. This site offers rewarding opportunities to photographers and for nature study. This site is used for camping and hiking and has potential for upland and big game hunting.

### Other products

Some Native American peoples traditionally ground parched seeds of spiny hopsage to make pinole flour. Indian ricegrass was traditionally eaten by some Native American peoples. The Paiutes used seed as a reserve food source.

Native Americans used the fleshy berries of Anderson wolfberry either fresh or boiled and then dried them for later use. This shrub is also used as an ornamental valued chiefly for its showy red berries.

## Other information

Spiny hopsage has moderate potential for erosion control and low to high potential for long-term re-vegetation projects. It can improve forage, control wind erosion, and increase soil stability on gentle to moderate slopes. Spiny hopsage is suitable for highway plantings on dry sites in Nevada.

Galleta is a good surface stabilizer, providing excellent surface erosion control.

Indian ricegrass is well-suited for surface erosion control and desert revegetation although it is not highly effective in controlling sand movement.

## Type locality

Location 1: Esmeralda County, NV	
Township/Range/Section	T2S R43E S32
General legal description	Approximately 2 miles east of Goldfield, west slopes of Banner Mountain, Esmeralda County, Nevada.
Location 2: Esmeralda County, NV	
Township/Range/Section	T2S R43E S33
General legal description	Approximately 2 miles east of Goldfield, west slopes of Banner Mountain, Esmeralda County, Nevada.

## Other references

Fire Effects Information System (Online; <http://www.fs.fed.us/database/feis/plants/>).

USDA-NRCS Plants Database (Online; <http://www.plants.usda.gov>).

## Contributors

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## 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)	
Contact for lead author	
Date	
Approved by	
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

## Indicators

1. **Number and extent of rills:**

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2. **Presence of water flow patterns:**



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3. **Number and height of erosional pedestals or terracettes:**

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

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5. **Number of gullies and erosion associated with gullies:**

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6. **Extent of wind scoured, blowouts and/or depositional areas:**

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7. **Amount of litter movement (describe size and distance expected to travel):**

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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):**

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9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):**

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10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:**

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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):**

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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:

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13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):**

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14. **Average percent litter cover (%) and depth ( in):**

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15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):**

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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:**

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17. **Perennial plant reproductive capability:**

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