

## **Ecological site R029XY025NV STREAMBANK 10-14 P.Z.**

Last updated: 2/20/2025  
Accessed: 02/24/2025

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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): 029X–Southern Nevada Basin and Range

The Southern Nevada Basin and Range MLRA (29) represents the transition from the Mojave Desert to the Great Basin. It is cooler and wetter than the Mojave. It is warmer and typically receives more summer precipitation than the Great Basin. This area is in Nevada (73 percent), California (25 percent), and Utah (2 percent). It makes up about 26,295 square miles (68,140 square kilometers). Numerous national forests occur in the area, including the San Bernardino, Angeles, Sequoia, Inyo, Humboldt-Toiyabe, and Dixie National Forests. Portions of Death Valley National Monument, the Nuclear Regulatory Commission's Nevada Test Site, the Hawthorne Ammunition Depot, and the Nellis Air Force Range in Nevada and the China Lake Naval Weapons Center in California also are in this MLRA. The northeast part of the Paiute Indian Reservation and the southern third of the Walker River Indian Reservation are in the part of this MLRA in Nevada, and the Lone Pine, Fort Independence, and Big Pine Indian Reservations are in the part in California.

#### **Physiography:**

The entire area is in the Great Basin Section of the Basin and Range Province of the Intermontane Plateaus. The area of broad, nearly level, aggraded desert basins and valleys between a series of mountain ranges trending north to south. The basins are bordered by sloping fans and pluvial lake terraces. The mountains are uplifted fault blocks with steep side slopes and not well dissected due to limited annual precipitation. Most of the valleys in this MLRA are closed basins or bolsons containing sinks or playa lakes.

#### **Geology:**

The mountains are dominated by Pliocene and Miocene andesite and basalt rocks, Paleozoic and Precambrian carbonate rocks prominent in some areas. Scattered outcrops of older Tertiary intrusives and very young tuffaceous sediments (Pliocene and Miocene) are in the western and eastern thirds of this MLRA. The valleys consist mostly of alluvial fill and playa deposits at the lowest elevations in the closed basins.

#### **Climate:**

The average annual precipitation is 3 to 12 inches (75 to 305 millimeters) in most of this area. It may be as high as 29 inches (735 millimeters), on the higher mountain slopes. Most of the rainfall occurs as high-intensity, convective thunderstorms during the growing season. Summers are dry, but sporadic storms are common in July and August.

#### **Water Resources:**

Water resources are scarce. Ground water and surface water sources are limited. Streams are small and intermittent. Quality of surface water is naturally degraded as streams cross area of valley fill effected by dissolved salts. Irrigation water may raise the levels of dissolved salts and suspended sediments causing contamination.

#### **Soils:**

Dominant soil orders include Entisols and Aridisols.

### **Ecological site concept**

The Streambank 10-14 P.Z. site occurs on inset fans, drainageways and stream terraces. It is on the edges and banks of perennial streams and is within the channel of ephemeral streambeds. Slopes range from 2 to 4 percent. Elevations are 3500 to about 6000 feet. The soils associated with this site are deep alluvium from mixed sources. They are highly variable in textures but most have loamy surfaces and gravelly subsoils. The water table is deeper

than 72 inches.

## Associated sites

R029XY001NV	<b>WET MEADOW 8-12 P.Z.</b> The Shallow Sandy Slope is found on slope of greater than 30 percent on mountains. The soil is less than 20 inches to a bedrock restrictive layer. The Shallow Sandy Slope site was previously known as <i>Pinus monophylla/Artemisia tridentata-Eriogonum wrightii</i> .
R029XY006NV	<b>LOAMY 8-10 P.Z.</b> This site is found on fan remnants. Soils associated with this site are well drained, shallow to a duripan, and formed in alluvium derived from volcanic parent material. The soil profile is characterized by an ochric epipedon, a cemented duripan within 50cm and an argillic horizon with no abrupt textural change.

## Similar sites

R029XY009NV	<b>UPLAND WASH</b> Poa spp. & ACHY dominant grasses; PRFA codominant shrub; less productive site
R029XY026NV	<b>STREAMBANK 14+ P.Z.</b> More productive site; mountain browse species prevalent

**Table 1. Dominant plant species**

Tree	Not specified
Shrub	(1) <i>Artemisia tridentata ssp. tridentata</i>
Herbaceous	(1) <i>Leymus cinereus</i> (2) <i>Elymus lanceolatus</i>

## Physiographic features

The Streambank 10-14 P.Z. site occurs on inset fans, drainageways and stream terraces. It is on the edges and banks of perennial streams and is within the channel of ephemeral streambeds. Slopes range from 2 to 4 percent. Elevations are 3500 to about 6000 feet.

**Table 2. Representative physiographic features**

Landforms	(1) Stream terrace (2) Fan skirt
Runoff class	Low
Flooding duration	Brief (2 to 7 days)
Flooding frequency	None to occasional
Ponding frequency	None
Elevation	3,580–5,970 ft
Slope	2–4%
Water table depth	72 in
Aspect	Aspect is not a significant factor

## Climatic features

The climate associated with this site is arid, characterized by cool, moist winters and hot, dry summers. Average annual precipitation is 10 to 14 inches. Mean annual air temperature is 49 to 60 degrees F. The average growing season is about 120 to 190 days. There are no climate stations associated with this site.

**Table 3. Representative climatic features**

Frost-free period (average)	190 days
Freeze-free period (average)	
Precipitation total (average)	14 in

## Influencing water features

This site may receive additional moisture by flooding due to its occurrence on stream banks and beds.

## Soil features

The soils associated with this site are deep alluvium from mixed sources. They are highly variable in textures but most have loamy surfaces and gravelly subsoils. Soils are well drained, available water capacity is very low to moderate and runoff is low. The soil series associated with this site include Mosida and Slaw.

**Table 4. Representative soil features**

Parent material	(1) Alluvium–volcanic rock (2) Alluvium
Surface texture	(1) Silt loam (2) Loam (3) Very gravelly, ashy coarse sandy loam
Family particle size	(1) Loamy
Drainage class	Well drained to somewhat excessively drained
Permeability class	Moderate to moderately rapid
Soil depth	72 in
Surface fragment cover <=3"	0%
Surface fragment cover >3"	0%
Available water capacity (0-40in)	0.3–6 in
Calcium carbonate equivalent (0-40in)	5–20%
Electrical conductivity (0-40in)	0–2 mmhos/cm
Sodium adsorption ratio (0-40in)	0
Soil reaction (1:1 water) (0-40in)	6.6–8.4
Subsurface fragment volume <=3" (Depth not specified)	0%
Subsurface fragment volume >3" (Depth not specified)	0–6%

## Ecological dynamics

The Streambank 10-14 P.Z. has a highly variable plant community and is periodically subject to major disturbance by naturally occurring floods. Specific plant composition within this community is determined primarily by the period of time since the last major run off event. Species likely to invade this site are annual forbs and grasses such as cheatgrass.

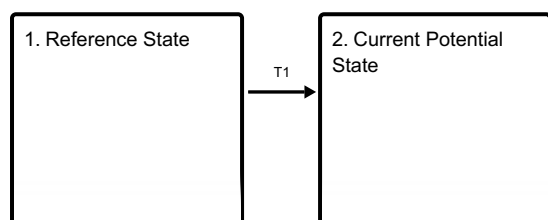
### Fire Ecology:

Fire return intervals in basin big sagebrush range between 25 to 70 years. A naturally wide variation in fire

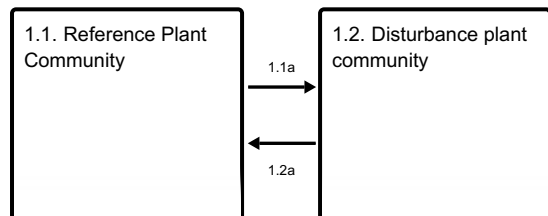
frequency in this system is expected. Basin big sagebrush is readily killed when aboveground plant parts are charred by fire. Prolific seed production from nearby unburned plants coupled with high germination rates enables seedlings to establish rapidly following fire. Rubber rabbitbrush is often top-killed by fire. Rubber rabbitbrush is a fire-adapted species that is typically unharmed or enhanced by fire. Recovery time is often rapid to very rapid. Rubber rabbitbrush is often one of the first species to colonize burned areas by sprouting or from off-site seed. Nevada ephedra generally sprouts after fire damages aboveground vegetation. Underground regenerative structures commonly survive when aboveground vegetation is consumed by fire. However, severe fires may kill shallowly buried regenerative structures. Basin wildrye is top-killed by fire. Older basin wildrye plants with large proportions of dead material within the perennial crown can be expected to show higher mortality due to fire than younger plants having little debris. Basin wildrye is generally tolerant of fire but may be damaged by early season fire combined with dry soil conditions. The major adaptation of western wheatgrass to fire is its rhizomatous growth form. During a fire the coarse culms usually burn fast with little or no heat transferred to the roots. Streambank wheatgrass is quite tolerant of fire. Subsurface growing points and primarily rhizomatous reproduction may explain its ability to increase rapidly (within 2-5 years) following burning. Needle and thread is top-killed by fire. It may be killed if the aboveground stems are completely consumed. Needle and thread is classified as slightly to severely damaged by fire. Needle and thread sprouts from the caudex following fire, if heat has not been sufficient to kill underground parts. Recovery usually takes 2 to 10 years.

## State and transition model

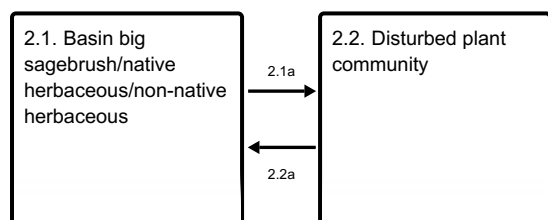
### Ecosystem states



### State 1 submodel, plant communities



### State 2 submodel, plant communities



## State 1

### Reference State

The Reference State consists of two primary plant communities. The plant communities are determined by time since disturbance. The vegetation is highly susceptible to infrequent flooding events. The force of the water can remove established vegetation. Over time, sagebrush and other herbaceous species may return.

### Community 1.1

#### Reference Plant Community

The reference plant community is dominated by basin wildrye, basin big sagebrush, and rhizomatous wheatgrasses. Potential vegetative composition is about 40 percent grasses, 10 percent forbs, 50 percent shrubs and 10 percent trees. Approximate ground cover (basal and crown) is 10 to 30 percent.

Table 5. Annual production by plant type

Plant Type	Low (Lb/Acre)	Representative Value (Lb/Acre)	High (Lb/Acre)
Shrub/Vine	200	350	450
Grass/Grasslike	160	280	360
Forb	40	70	90
<b>Total</b>	<b>400</b>	<b>700</b>	<b>900</b>

**Community 1.2**  
**Disturbance plant community**

Community 1.2 occurs after a disturbance, such as flooding, that removes the current vegetation.

**Pathway 1.1a**  
**Community 1.1 to 1.2**

Vegetation removing disturbance, such as a flood.

**Pathway 1.2a**  
**Community 1.2 to 1.1**

Time since disturbance.

**State 2**  
**Current Potential State**

Similar to the Reference State, except the Current Potential State has non-native plants established in the plant community.

**Community 2.1**  
**Basin big sagebrush/native herbaceous/non-native herbaceous**

Similar to Community Phase 1.1, except non-native species are established in the 2.1 plant community.

**Community 2.2**  
**Disturbed plant community**

Similar to Community Phase 1.2, except the 2.1 plant community has non-native plant species.

**Pathway 2.1a**  
**Community 2.1 to 2.2**

Disturbance that removes current vegetation, such as a large flood event.

**Pathway 2.2a**  
**Community 2.2 to 2.1**

Time since disturbance, allows basin big sagebrush and other species to establish.

**Transition T1**  
**State 1 to 2**

Establishment of non-native plants.

## 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	<b>Primary Perennial Grasses</b>			86–280	
	basin wildrye	LECI4	<i>Leymus cinereus</i>	70–105	–
	western wheatgrass	PASM	<i>Pascopyrum smithii</i>	1–70	–
	thickspike wheatgrass	ELLA3	<i>Elymus lanceolatus</i>	1–70	–
	needle and thread	HECO26	<i>Hesperostipa comata</i>	14–35	–
2	<b>Secondary Perennial Grasses/Grasslikes</b>			35–70	
	Indian ricegrass	ACHY	<i>Achnatherum hymenoides</i>	4–21	–
	sedge	CAREX	<i>Carex</i>	4–21	–
	squirreltail	ELEL5	<i>Elymus elymoides</i>	4–21	–
	slender wheatgrass	ELTR7	<i>Elymus trachycaulus</i>	4–21	–
	alkali sacaton	SPAI	<i>Sporobolus airoides</i>	4–21	–
<b>Forb</b>					
3	<b>Perennial</b>			35–105	
	thickspike wheatgrass	ELLA3	<i>Elymus lanceolatus</i>	1–70	–
	western wheatgrass	PASM	<i>Pascopyrum smithii</i>	1–70	–
	milkvetch	ASTRA	<i>Astragalus</i>	4–21	–
	lupine	LUPIN	<i>Lupinus</i>	4–21	–
<b>Shrub/Vine</b>					
4	<b>Primary Shrubs</b>			189–280	
	basin big sagebrush	ARTRT	<i>Artemisia tridentata ssp. tridentata</i>	140–175	–
	rubber rabbitbrush	ERNAN5	<i>Ericameria nauseosa ssp. nauseosa var. nauseosa</i>	35–70	–
	Nevada jointfir	EPNE	<i>Ephedra nevadensis</i>	14–35	–
	alkali sacaton	SPAI	<i>Sporobolus airoides</i>	6–12	–
5	<b>Secondary Shrubs</b>			105–175	
	desert-thorn	LYCIU	<i>Lycium</i>	7–35	–
	desert almond	PRFA	<i>Prunus fasciculata</i>	7–35	–
	Woods' rose	ROWO	<i>Rosa woodsii</i>	7–35	–
	sedge	CAREX	<i>Carex</i>	6–12	–
<b>Tree</b>					
6	<b>Deciduous</b>			28–126	
	Fremont cottonwood	POFR2	<i>Populus fremontii</i>	14–70	–
	willow	SALIX	<i>Salix</i>	14–56	–

## **Animal community**

### **Livestock Interpretations:**

This site is suited for livestock grazing. Grazing management should be keyed to perennial grass production. The early growth and abundant production of basin wildrye make it a valuable source of forage for livestock. It is important forage for cattle and is readily grazed by cattle and horses in early spring and fall. Though coarse-textured during the winter, basin wildrye may be utilized more frequently by livestock and wildlife when snow has covered low shrubs and other grasses. Western wheatgrass provides important forage for domestic sheep. Fall regrowth cures well on the stem, so western wheatgrass is good winter forage for domestic livestock. Streambank wheatgrass is palatable to all classes of livestock and wildlife. It is a preferred feed for cattle, sheep, horses, and elk in spring and is considered a desirable feed for deer and antelope in spring. It is considered a desirable feed for cattle, sheep, and horses in summer, fall, and winter. Streambank wheatgrass's extensive rhizome system allows established stands to withstand heavy grazing and trampling. Needleandthread provides highly palatable forage, especially in the spring before fruits have developed. Needlegrasses are grazed in the fall only if the fruits are softened by rain. Basin big sagebrush may serve as emergency food during severe winter weather, but it is not usually sought out by livestock. In general, livestock forage only lightly on rubber rabbitbrush during the summer, but winter use can be heavy in some locations. Fall use is variable, but flowers are often used by livestock. A few leaves and the more tender stems may also be used. Nevada ephedra is important winter range browse for domestic cattle, sheep and goats.

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:**

Basin big sagebrush is browsed by mule deer from fall to early spring, but is not preferred. Basin big sagebrush is the least palatable of all the subspecies of big sagebrush. Wildlife forage only lightly on rubber rabbitbrush during the summer, but winter use can be heavy in some locations. Fall use is variable, but flowers are often used by wildlife. A few leaves and the more tender stems may also be used. The forage value of rubber rabbitbrush varies greatly among subspecies and ecotypes. Mule deer, bighorn sheep, and pronghorn browse Nevada ephedra, especially in spring and late summer when new growth is available. Basin wildrye provides winter forage for mule deer, though use is often low compared to other native grasses. Basin wildrye provides summer forage for black-tailed jackrabbits. Because basin wildrye remains green throughout early summer, it remains available for small mammal forage for longer time than other grasses. Elk consume western wheatgrass during the fall, winter, spring, and summer. Western wheatgrass is used by various small mammals. In the spring, streambank wheatgrass is a preferred feed for elk and is considered desirable feed for deer and antelope. It is desirable feed for elk during summer, fall, and winter. Streambank wheatgrass is also a component of black-tailed jackrabbit diets. Streambank wheatgrass provides some cover for small mammals and birds. Needleandthread is moderately important spring forage for mule deer, but use declines considerably as more preferred forages become available.

## **Hydrological functions**

Rills, waterflow patterns, erosional pedestals and terracets are rare. Gullies may be observed in areas where gullies and head cuts associated with ephemeral channel entrenchment are common. Gullies and head cuts should be healing or stable. Perennial herbaceous plants (especially deep-rooted bunchgrasses [i.e., basin wildrye] slow runoff and increase infiltration. Tree canopy (less than 10%) and understory shrubs (including associated litter) break raindrop impact and provide opportunity for snow catch and accumulation on site.

## **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 bird and big game hunting.

## **Other products**

Some Native American peoples used the bark of big sagebrush to make rope and baskets. Native Americans used Nevada ephedra as a tea to treat stomach and kidney ailments. Basin wildrye was used as bedding for various

Native American ceremonies, providing a cool place for dancers to stand.

## Other information

Basin big sagebrush shows high potential for range restoration and soil stabilization. Basin big sagebrush grows rapidly and spreads readily from seed. Nevada ephedra is useful for erosion control, and seedlings have been successfully planted onto reclaimed strip mines, with survival ranging from 12 to 94%. Atrazine may be effective in controlling Nevada ephedra, though some plants can survive through crown sprouting. Irrigation may increase control by atrazine. Basin wildrye is useful in mine reclamation, fire rehabilitation and stabilizing disturbed areas. Its usefulness in range seeding, however, may be limited by initially weak stand establishment. Western wheatgrass is a good soil binder and is well suited for reclamation of disturbed sites. Thickspike is a good revegetation species because it forms tight sod under dry rangeland conditions, has good seedling strength, and performs well in low fertility or eroded sites. It does not compete well with aggressive introduced grasses during the establishment period, but are very compatible with slower developing natives, bluebunch wheatgrass (*Pseudoroegneria spicata*), western wheatgrass (*Pascopyrum smithii*), and needlegrass (*Achnatherum* spp.) species. It's drought tolerance combined with rhizomes, fibrous root systems, and good seedling vigor make these species ideal for reclamation in areas receiving 8 to 20 inches annual precipitation. Thickspike wheatgrass can be used for hay production and will make nutritious feed, but is more suited to pasture use. Needleandthread is useful for stabilizing eroded or degraded sites.

## Inventory data references

NASIS soil component data.

## Type locality

Location 1: Nye County, NV	
Township/Range/Section	T8N R50E S35
General legal description	Hot Creek Canyon, Nye County, Nevada
Location 2: Nye County, NV	
Township/Range/Section	T2N R49E S19
General legal description	Haws Canyon, Stone Cabin Valley, Nye County, Nevada.

## Other references

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

United States Department of Agriculture, Natural Resources Conservation Service. 2022. Land resource regions and major land resource areas of the United States, the Caribbean, and the Pacific Basin. U.S. Department of Agriculture, Agriculture Handbook 296.

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

## Contributors

HA

## Approval

Kendra Moseley, 2/20/2025

## 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)	GK BRACKLEY
Contact for lead author	State Rangeland Management Specialist
Date	06/20/2006
Approved by	Kendra Moseley
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

## Indicators

1. **Number and extent of rills:** Rills are rare.
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2. **Presence of water flow patterns:** Water flow patterns are rare
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3. **Number and height of erosional pedestals or terracettes:** Pedestals are rare.
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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  $\pm$  50%; surface rock fragments  $\pm$ 15%; tree canopy <10%; shrub canopy 20%; basal area for perennial herbaceous plants  $\pm$ 5%.
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5. **Number of gullies and erosion associated with gullies:** Gullies may be observed in areas where gullies and head cuts associated with ephemeral channel entrenchment are common. Gullies and head cuts should be healing or stable.
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6. **Extent of wind scoured, blowouts and/or depositional areas:** None
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7. **Amount of litter movement (describe size and distance expected to travel):** Fine litter (foliage from grasses and annual & perennial forbs) is expected to move the distance of slope length during intense summer convection storms or severe flooding events. Persistent litter (large woody material) will remain in place except during catastrophic events.
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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 values should be 3 to 6 on most soil textures found on this site. Areas of this site occurring on soils that have a physical crust will probably have stability values less than 3. (To be field tested.)
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9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** Surface structure is typically thin to thick platy or massive. Soil surface colors are light and the soils are typified by an ochric epipedon. Organic carbon of the surface 2 to 3 inches is typically 1 to 1.5 percent dropping off quickly below. Organic

matter content can be more or less depending on micro-topography.

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10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:** Perennial herbaceous plants (especially deep-rooted bunchgrasses [i.e., basin wildrye] slow runoff and increase infiltration. Tree canopy (less than 10%) and understory shrubs (including associated litter) break raindrop impact and provide opportunity for snow catch and accumulation on site.
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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):** Compacted layers are not typical. Platy or massive sub-surface horizons, subsoil argillic horizons or hardpans shallow to the surface are not to be interpreted as compacted layers.
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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: Reference Plant Community: Tall, non-sprouting, shrubs > deep-rooted, cool season, perennial bunchgrasses = rhizomatous grasses = associated, crown-sprouting, shrubs. (By above ground production)

Sub-dominant: Trees (less than 10% canopy cover) = deep-rooted, cool season, perennial forbs > fibrous, shallow-rooted, cool season, perennial forbs = annual forbs. (By above ground production)

Other:

Additional:

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13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):** Dead branches within individual shrubs are common and standing dead shrub canopy material to 15% of total woody canopy; some of the mature bunchgrasses (<5%) have dead centers.
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14. **Average percent litter cover (%) and depth ( in):** Within plant interspaces ( $\pm 20\%$ ) and depth of litter is  $< \frac{1}{2}$  inch
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15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):** For normal or average growing season  $\pm 700$  lbs/ac.
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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 and Utah juniper are invaders on this site.
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17. **Perennial plant reproductive capability:** All functional groups should reproduce in average (or normal) and above average growing season years.

