USDA Natural Resources Conservation Service

Ecological site R029XY026NV
STREAMBANK 14+ P.Z.

Last updated: 2/20/2025
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.

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 in 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 14+ P.Z. site occurs on low stream terraces and flood plains, generally occupying a position on the edges and banks of perennial streams. Slopes range from 2 to 15 percent. Elevations are 5500 to over 6700 feet. The soils are deep derived from alluvium from mixed sources. The soils are quite diverse in surface texture but gravelly to cobbly loams or sandy loams are common. The water table is deeper than 72 inches.

Associated sites

R029XY051NV	**LOAMY SLOPE 16+ P.Z.** This site occurs on straight to convex mountain sideslopes on all exposures. This site is restricted to northerly aspects at the lower elevations of its occurrence. Slopes range from 2 to 75 percent, but slope gradients of 15 to 75 percent are typical. Elevations are 7000 to about 10,000 feet. The soils are from residuum and colluvium derived from volcanic rocks. These soils are typically well drained.

Similar sites

R029XY025NV	**STREAMBANK 10-14 P.Z.** Less productive site; basin big sagebrush dominant shrub
R029XY009NV	**UPLAND WASH** Poa spp. & ACHY dominant grasses; PRFA codominant shrub; less productive site.

Table 1. Dominant plant species

Tree	Not specified
Shrub	(1) *Artemisia tridentata ssp. vaseyana*
Herbaceous	(1) *Leymus cinereus* (2) *Achnatherum*

Physiographic features

The Streambank 14+ P.Z. site occurs on low stream terraces and flood plains, generally occupying a position on the edges and banks of perennial streams. Slopes range from 2 to 15 percent. Elevations are 5500 to over 6700 feet.

Table 2. Representative physiographic features

Landforms	(1) Stream terrace (2) Flood plain
Runoff class	Low
Flooding duration	Very brief (4 to 48 hours)
Flooding frequency	Very rare to rare
Elevation	5,510–6,730 ft
Slope	2–15%
Water table depth	72 in
Aspect	Aspect is not a significant factor

Climatic features

Average annual precipitation is 14 to over 20 inches. Mean annual air temperature is 39 to 52 degrees F. The average growing season is about 50 to 130 days. There is no climate station available for this site.

Table 3. Representative climatic features

Frost-free period (average)	130 days
Freeze-free period (average)	
Precipitation total (average)	20 in

Influencing water features

This site may receive additional moisture by flooding due to its occurrence on banks of perennial streams.

Soil features

The soils are deep derived from alluvium from mixed sources. The soils are quite diverse in surface texture but gravelly to cobbly loams or sandy loams are common. These soils have moderately rapid water intake rates, available water capacity is low to moderate, runoff is medium and the soils are well drained. This site receives extra water from perennial streams or perched water tables. The soil series associated with this site is Cabinpine and Fanu.

Table 4. Representative soil features

Parent material	(1) Alluvium
Surface texture	(1) Gravelly fine sandy loam (2) Gravelly sand
Drainage class	Well drained
Permeability class	Moderate to moderately rapid
Soil depth	72–84 in
Surface fragment cover <=3"	10–15%
Surface fragment cover >3"	0–5%
Available water capacity (0-40in)	2.1–5.8 in
Calcium carbonate equivalent (0-40in)	0–30%
Electrical conductivity (0-40in)	0–4 mmhos/cm
Sodium adsorption ratio (0-40in)	0–5
Soil reaction (1:1 water) (0-40in)	7.4–9
Subsurface fragment volume <=3" (Depth not specified)	10–15%
Subsurface fragment volume >3" (Depth not specified)	0–30%

Ecological dynamics

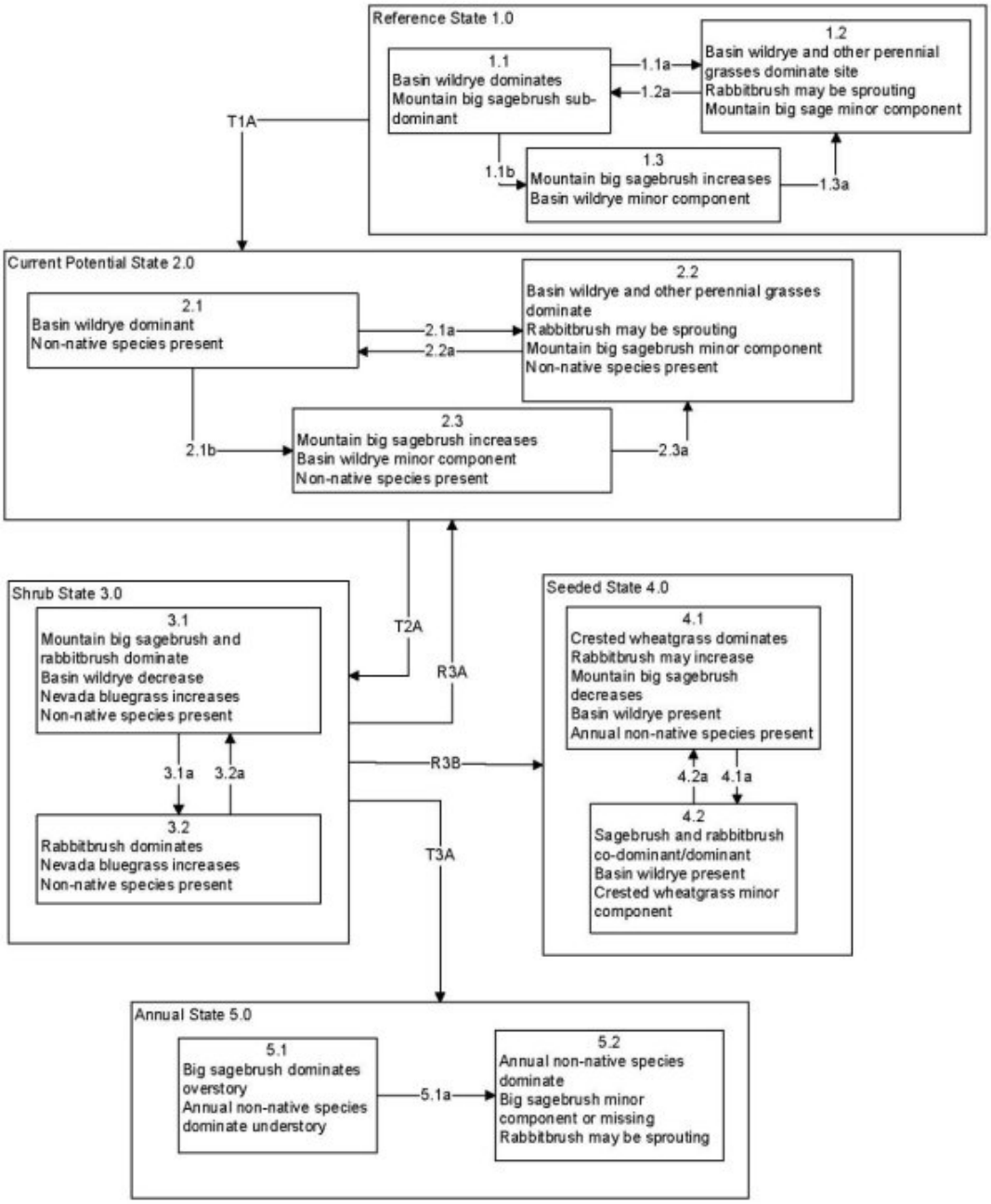
Where management results in abusive livestock use, big sagebrush and rubber rabbitbrush increase while desirable forage grasses and the various palatable shrubs such as bitterbrush and serviceberry decrease. Species likely to invade this site are annual forbs and grasses.

Fire Ecology:
Pre-settlement fire return intervals in mountain big sagebrush communities varied from 15 to 25 years. Plants are readily killed in all seasons, even light severity fires. Mountain big sagebrush is highly susceptible to injury from fire. It is often top-killed by fire and will not resprout. Aboveground parts of Utah serviceberry may be killed or consumed under fire conditions with sufficient flame lengths. Utah serviceberry may be slightly harmed by fire, depending on moisture conditions, but is generally considered to be fire tolerant. Utah serviceberry sprouts from the root crown following fire. Soil moisture is important to aid sprouting. Antelope bitterbrush is considered a weak sprouter and is often killed by summer or fall fire. Antelope bitterbrush in some areas may sprout after light-severity spring fire. High fuel consumptions increase antelope bitterbrush mortality and therefore favors seedling establishment. Currant regeneration is favored by short-duration, low-severity fire because soil-stored seed requires scarification to germinate. Most Currant plants are severely damaged or killed by fire. The ability of Currant to sprout after fire is described in the literature as "weak." Common snowberry is classified as a "survivor" and has high resistance to

fire. It is a rhizomatous species with rhizomes buried 2 to 5 inches (5-12.5 cm) deep in mineral soil. After fire has killed the top of the plant, new growth sprouts from these rhizomes. This rhizomatous growth response is highly variable and depends on conditions at specific sites. Regeneration from buried seed is favored by fires of low severity and short duration that remove little of the soil organic level. 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 effects of fire on slender wheatgrass are dependent on its growth form. Tall, decadent plants with many leaves sustain the most fire damage, while those with short, sparse growth form, is the least likely to sustain damage to the root system during a fire. 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. Western needlegrass is moderately damaged by fire. The recovery time is between 3 and 5 years. Little specific information is available on adaptations of Letterman's needlegrass to fire. It is morphologically similar to Columbia needlegrass, which is only slightly to moderately damaged by fire. Season of burn affects the plant's ability to survive a fire. Post-fire regeneration is through seeding and tillering. Thurber’s needlegrass is classified as moderately resistant, but depending on season of burn, phenology, and fire severity, this perennial bunchgrass is moderately to severely damaged by fire. Burning has been found to decrease the vegetation and reproductive vigor. Early season burning is more damaging to this needlegrass than late season burning.

Community Phase 1.1 - The reference plant community is dominated by mountain big sagebrush, rhizomatous wheatgrasses and basin wildrye with less than a 10 percent overstory canopy of mixed tree species. Potential vegetative composition is about 30 percent grasses, 15 percent forbs and 45 percent shrubs and 10 percent trees. Approximate ground cover (basal and crown) is 30 to 60 percent.

State and transition model


Reference State 1.0
1.1
Basin wildrye dominates
Mountain big sagebrush sub-dominant
1.1a
1.2a
1.2
Basin wildrye and other perennial grasses dominate site
Rabbitbrush may be sprouting
Mountain big sage minor component
T1A
1.1b
1.3
Mountain big sagebrush increases
Basin wildrye minor component
1.3a
Current Potential State 2.0
2.1
Basin wildrye dominant
Non-native species present
2.1a
2.2a
2.2
Basin wildrye and other perennial grasses dominate
Rabbitbrush may be sprouting
Mountain big sagebrush minor component
Non-native species present
2.1b
2.3
Mountain big sagebrush increases
Basin wildrye minor component
Non-native species present
2.3a
Shrub State 3.0
3.1
Mountain big sagebrush and rabbitbrush dominate
Basin wildrye decrease
Nevada bluegrass increases
Non-native species present
T2A
R3A
3.1a
3.2a
3.2
Rabbitbrush dominates
Nevada bluegrass increases
Non-native species present
R3B
Seeded State 4.0
4.1
Crested wheatgrass dominates
Rabbitbrush may increase
Mountain big sagebrush decreases
Basin wildrye present
Annual non-native species present
4.2a
4.1a
4.2
Sagebrush and rabbitbrush co-dominant/dominant
Basin wildrye present
Crested wheatgrass minor component
T3A
Annual State 5.0
5.1
Big sagebrush dominates overstory
Annual non-native species dominate understory
5.1a
5.2
Annual non-native species dominate
Big sagebrush minor component or missing
Rabbitbrush may be sprouting

Reference State 1.0 Community Phase Pathways
1.1a: Fire significantly reduces sagebrush cover and leads to early/mid-seral community, dominated by grasses and forbs. Aroga moth may cause a large die-off in sagebrush resulting in a mosaic of grass and sagebrush.
1.1b: Time and lack of disturbance such as fire. Excessive herbivory, chronic drought or combinations may also decrease perennial understory.
1.2a: Time and lack of disturbance allows for shrub regeneration.
1.3a: Fire significantly reduces sagebrush cover and leads to early/mid-seral community, dominated by grasses and forbs. Aroga moth may cause a large die-off in sagebrush resulting in a mosaic of grass and sagebrush.

Transition T1A: Introduction of non-native species such as cheatgrass.

Current Potential State 2.0 Community Phase Pathways
2.1a: Fire creates grass/sagebrush mosaic. Aroga moth may also cause a large die-off in sagebrush; non-native annual species present.
2.1b: Time and lack of disturbance such as fire. Inappropriate grazing management, chronic drought or combinations may also reduce perennial understory.
2.2a: Time and lack of disturbance allows for regeneration of sagebrush
2.3a: Fire reduces sagebrush. Aroga moth infestation may create a sagebrush/grass mosaic. Brush management with minimal soil disturbance; late-fall/winter grazing causing mechanical damage to sagebrush.

Transition T2A: Hydrologic alteration (lowering of water table i.e. gullying of associated channel), inappropriate grazing management or combinations (3.1). Fire (3.2)

Shrub State 3.0 Community Phase Pathways
3.1a: Fire and/or brush management with minimal soil disturbance
3.2a: Time and lack of disturbance (not likely to occur)

Transition T3A: Continual inappropriate grazing management and/or hydrologic alteration (i.e. gullying of associated channel) (5.1). Severe fire, and/or failed brush management and seeding (5.2)

Restoration R3A: Brush management and seeding of native species, may be coupled with restoration of channel (2.2)
Restoration R3B: Brush management with minimal soil disturbance coupled with seeding of desired species (4.1)

Seeded State 4.0 Community Phase Pathways
4.1a: Time and lack of disturbance; inappropriate grazing management may also reduce perennial understory
4.2a: Fire, brush management, and/or Aroga moth infestation.

Annual State 5.0 Community Phase Pathways
5.1a: Severe fire or failed brush treatment and seeding.

Animal community

Livestock Interpretations:
This site is suited to livestock grazing. Grazing management should be keyed to Basin wildrye, Slender wheatgrass, Streambank wheatgrass, Needlegrass, and other 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. Slender wheatgrass is grazed by all classes of livestock. Streambank wheatgrass is palatable to all classes of livestock. It is a preferred feed for cattle, sheep, and horses. 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. Western needlegrass has a spreading and deeply penetrating root system, which makes it resistant to trampling. Letterman’s needlegrass begins growth early in the year and remains green throughout the relatively long growing season, thus, making it valuable forage for livestock. Thurber’s needlegrass species begin growth early in the year and remain green throughout a relatively long growing season. This pattern of development enables animals to use Thurber’s needlegrass when many other grasses are unavailable. Cattle prefer Thurber’s needlegrass in early spring before fruits have developed as it becomes less palatable when mature. Thurber’s needlegrasses are grazed in the fall only if the fruits are softened by rain. Mountain big sagebrush is eaten by domestic livestock but has long been considered to be of low palatability, and a competitor to more desirable species. Utah serviceberry provides good browse for domestic sheep and domestic goats. In the spring, Utah serviceberry provides fair forage for cattle and good to excellent browse for domestic sheep and goats. Utah serviceberry provides good forage late in winter and in early spring, because it leafs out and blooms earlier than associated species. Antelope bitterbrush is important browse for livestock. Domestic livestock and mule deer may compete for antelope bitterbrush in late summer, fall, and/or winter. Cattle prefer antelope bitterbrush from mid-May through June and again in September and October. Current is fair to poor browse for livestock. Common snowberry is considered important browse for many types of livestock. It is especially important to domestic sheep and cattle. Common snowberry was found to be highly palatable to cattle. It plays a critical role in permitting cattle to meet their protein requirements during the latter half of the growing season. Domestic sheep also utilize common snowberry for browse and it is considered fair to good forage. It is has no forage value for horses.

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:
Mountain big sagebrush is highly preferred and nutritious winter forage for mule deer and elk. Sagebrush-grassland communities provide critical sage-grouse breeding and nesting habitats. Meadows surrounded by sagebrush may be used as feeding and strutting grounds. Sagebrush is a crucial component of their diet year-round, and sage-grouse select sagebrush almost exclusively for cover. Sage-grouse prefer mountain big sagebrush and Wyoming big sagebrush communities to basin big sagebrush communities. Utah serviceberry is a very important species for mule deer in the Great Basin. Porcupines and desert bighorn sheep also use Utah serviceberry. Utah serviceberry fruit is preferred by many birds. It can be an important winter food for birds since berries stay on the shrub throughout the winter. In Nevada, sage grouse eat the fruit of Utah serviceberry. Pronghorn antelope, mule deer, elk, and bighorn sheep utilize antelope bitterbrush extensively. Mule deer use of antelope bitterbrush peaks in September, when antelope bitterbrush may compose 91 percent of the diet. Winter use is greatest during periods of deep snow. Antelope bitterbrush seed is a large part of the diets of rodents, especially deer mice and kangaroo rats. Currant provides food and cover for wildlife. It is only fair to poor browse for deer, but it is important on ranges where little else is available. Common snowberry is considered important browse for many types of wildlife. Bighorn sheep use common snowberry regularly during the summer. Forage value to elk is fair. Common snowberry is important as both cover and food for bird and small mammal populations. These include sharp-tailed, ruffed, and blue grouse, wild turkey and, several non-game species of bird including the kingbird, western flycatcher, and western bluebird. Among small mammals that rely on common snowberry are fox squirrels, desert cottontails, and pocket gopher.

Hydrological functions

Runoff is low. Drainage is well with moderate to rapid permeability.

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

Native Americans used big sagebrush leaves and branches for medicinal teas, and the leaves as a fumigant. Bark was woven into mats, bags and clothing. Utah serviceberry fruits were used by Native Americans and early European explorers in North America for food and medicine. The fruit of wax currant is used for making jam, jelly, or pie. Some western Indian tribes used currants for making pemmican. Currant is cultivated as an ornamental. Common snowberry fruit was eaten fresh but was not favored by Native Americans in Washington and Oregon. The fruits were eaten fresh and also dried for winter use. Common snowberry was used on hair as soap, and the fruits and leaves mashed and applied to cuts or skin sores as a poultice and to soothe sore, runny eyes. Tea from the bark was used as a remedy for tuberculosis and sexually transmitted diseases. A brew made from the entire plant was used as a physic tonic. Arrowshafts and pipestems were made from the stems.

Other information

Utah serviceberry has been used to revegetate big game winter range and for surface stabilization. It grows slowly from seed and therefore transplanting may be more successful than seeding for revegetation projects. Antelope bitterbrush has been used extensively in land reclamation. Antelope bitterbrush enhances succession by retaining soil and depositing organic material and in some habitats and with some ecotypes, by fixing nitrogen.

Inventory data references

NASIS soil component data.

Type locality

Location 1: Nye County, NV	
Township/Range/Section	T1N R49E S3
General legal description	Haws Canyon area, 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
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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)	
Contact for lead author	
Date	05/11/2025
Approved by	Kendra Moseley
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

Indicators

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

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

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

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

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

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

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

8. **Soil surface (top few mm) resistance to erosion (stability values are averages - most sites will show a range of values):**

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

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

11. **Presence and thickness of compaction layer (usually none; describe soil profile features which may be mistaken for compaction 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:

    Sub-dominant:

    Other:

    Additional:

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

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

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

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:**

17. **Perennial plant reproductive capability:**