

Ecological site R026XY073NV STREAMBANK

Last updated: 4/10/2024
Accessed: 04/25/2024

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.

MLRA notes

Major Land Resource Area (MLRA): 026X—Carson Basin and Mountains

The area lies within western Nevada and eastern California, with about 69 percent being within Nevada, and 31 percent being within California. Almost all this area is in the Great Basin Section of the Basin and Range Province of the Intermontane Plateaus. Isolated north-south trending mountain ranges are separated by aggraded desert plains. The mountains are uplifted fault blocks with steep side slopes. Most of the valleys are drained by three major rivers flowing east across this MLRA. A narrow strip along the western border of the area is in the Sierra Nevada Section of the Cascade-Sierra Mountains Province of the Pacific Mountain System. The Sierra Nevada Mountains are primarily a large fault block that has been uplifted with a dominant tilt to the west. This structure leaves an impressive wall of mountains directly west of this area. This helps create a rain shadow affect to MLRA 26. Parts of this eastern face, but mostly just the foothills, mark the western boundary of this area. Elevations range from about 3,806 feet (1,160 meters) on the west shore of Pyramid Lake to 11,653 feet (3,552 meters) on the summit of Mount Patterson in the Sweetwater Mountains.

Valley areas are dominantly composed of Quaternary alluvial deposits with Quaternary playa or alluvial flat deposits often occupying the lowest valley bottoms in the internally drained valleys, and river deposited alluvium being dominant in externally drained valleys. Hills and mountains are dominantly Tertiary andesitic flows, breccias, ash flow tuffs, rhyolite tuffs or granodioritic rocks. Quaternary basalt flows are present in lesser amounts, and Jurassic and Triassic limestone and shale, and Precambrian limestone and dolomite are also present in very limited amounts. Also of limited extent are glacial till deposits along the east flank of the Sierra Nevada Mountains, the result of alpine glaciation.

The average annual precipitation in this area is 5 to 36 inches (125 to 915 millimeters), increasing with elevation. Most of the rainfall occurs as high-intensity, convective storms in spring and autumn. Precipitation is mostly snow in winter. Summers are dry. The average annual temperature is 37 to 54 degrees F (3 to 12 degrees C). The freeze-free period averages 115 days and ranges from 40 to 195 days, decreasing in length with elevation.

The dominant soil orders in this MLRA are Aridisols and Mollisols. The soils in the area dominantly have a mesic soil temperature regime, an aridic or xeric soil moisture regime, and mixed or smectitic mineralogy. They generally are well drained, are clayey or loamy and commonly skeletal, and are very shallow to moderately deep.

This area supports shrub-grass vegetation characterized by big sagebrush. Low sagebrush and Lahontan sagebrush occur on some soils. Antelope bitterbrush, squirreltail, desert needlegrass, Thurber needlegrass, and Indian ricegrass are important associated plants. Green ephedra, Sandberg bluegrass, Anderson peachbrush, and several forb species also are common. Juniper-pinyon woodland is typical on mountain slopes. Jeffrey pine, lodgepole pine, white fir, and manzanita grow on the highest mountain slopes. Shadscale is the typical plant in the drier parts of the area. Sedges, rushes, and moisture-loving grasses grow on the wettest parts of the wet flood plains and terraces. Basin wildrye, alkali sacaton, saltgrass, buffaloberry, black greasewood, and rubber rabbitbrush grow on the drier sites that have a high concentration of salts.

Some of the major wildlife species in this area are mule deer, coyote, beaver, muskrat, jackrabbit, cottontail, raptors, pheasant, chukar, blue grouse, mountain quail, and mourning dove. The species of fish in the area include trout and catfish. The Lahontan cutthroat trout in the Truckee River is a threatened and endangered species.

LRU notes

The "XY" LRU contains all the sites that cross other LRU boundaries. The sites are typically found along waterways.

Ecological site concept

The Streambank site is found on flood plains, drainageways, and stream terraces on slopes less than 8 percent. The site is flooded occasionally for brief to very brief periods. The water table is between 12 and 36 inches deep. The dominant plants are yellow willow (*Salix lutea*), silver buffaloberry (*Shepherdia argentea*), beardless wildrye (*Leymus triticoides*), and Nevada bluegrass (*Poa nevadensis*).

Associated sites

R026XY003NV	WET MEADOW 10-14 P.Z.
R026XY030NV	LOAMY BOTTOM 8-12 P.Z.
R026XY054NV	WET MEADOW 14+ P.Z.
R026XY057NV	LOAMY BOTTOM 14+ P.Z.

Similar sites

R026XY054NV	WET MEADOW 14+ P.Z. SALIX species minor component of plant community
R026XY003NV	WET MEADOW 10-14 P.Z. SALIX species minor component of plant community
R026XY001NV	MOIST FLOODPLAIN SALIX species minor component of plant community

Table 1. Dominant plant species

Tree	Not specified
Shrub	(1) <i>Salix lutea</i> (2) <i>Shepherdia argentea</i>
Herbaceous	(1) <i>Leymus triticoides</i> (2) <i>Poa nevadensis</i>

Physiographic features

This site occurs along perennial streams, stream terraces, drainageways of mountain valleys. Slopes range from 0 to 8 percent. Elevations are 4700 to 4800 feet.

Table 2. Representative physiographic features

Landforms	(1) Stream terrace (2) Drainageway (3) Flood plain
Runoff class	Low to high
Flooding duration	Very brief (4 to 48 hours) to brief (2 to 7 days)
Flooding frequency	None to occasional
Ponding frequency	None
Elevation	4,700–4,800 ft

Slope	0–8%
Water table depth	12–36 in
Aspect	Aspect is not a significant factor

Climatic features

The climate associated with this site is subhumid with cool, dry summers and cold, wet winters. Average precipitation is 10 to 14 inches. Mean annual air temperature is 40 to 46 degrees F. The average growing season is about 75 to 90 days.

Nevada’s climate is predominantly arid, with large daily ranges of temperature, infrequent severe storms, heavy snowfall in the higher mountains, and great location variations with elevation. Three basic geographical factors largely influence Nevada’s climate: continentality, latitude, and elevation. Continentality is the most important factor. The strong continental effect is expressed in the form of both dryness and large temperature variations. Nevada lies on the eastern, lee side of the Sierra Nevada Range, a massive mountain barrier that markedly influences the climate of the State. The prevailing winds are from the west, and as the warm moist air from the Pacific Ocean ascend the western slopes of the Sierra Range, the air cools, condensation occurs and most of the moisture falls as precipitation. As the air descends the eastern slope, it is warmed by compression, and very little precipitation occurs. The effects of this mountain barrier are felt not only in the West but throughout the state, with the result that the lowlands of Nevada are largely desert or steppes. The temperature regime is also affected by the blocking of the inland-moving maritime air. Nevada sheltered from maritime winds, has a continental climate with well-developed seasons and the terrain responds quickly to changes in solar heating.

Nevada lies within the mid-latitude belt of prevailing westerly winds which occur most of the year. These winds bring frequent changes in weather during the late fall, winter and spring months, when most of the precipitation occurs. To the south of the mid-latitude westerlies, lies a zone of high pressure in subtropical latitudes, with a center over the Pacific Ocean. In the summer, this high-pressure belt shifts northward over the latitudes of Nevada, blocking storms from the ocean. The resulting weather is mostly clear and dry during the summer and early fall, with scattered thundershowers. The eastern portion of the state receives significant summer thunderstorms generated from monsoonal moisture pushed up from the Gulf of California, known as the North American monsoon. The monsoon system peaks in August and by October the monsoon high over the Western U.S. begins to weaken and the precipitation retreats southward towards the tropics (NOAA 2004).

Table 3. Representative climatic features

Frost-free period (characteristic range)	
Freeze-free period (characteristic range)	
Precipitation total (characteristic range)	10-14 in
Frost-free period (average)	82 days
Freeze-free period (average)	
Precipitation total (average)	12 in

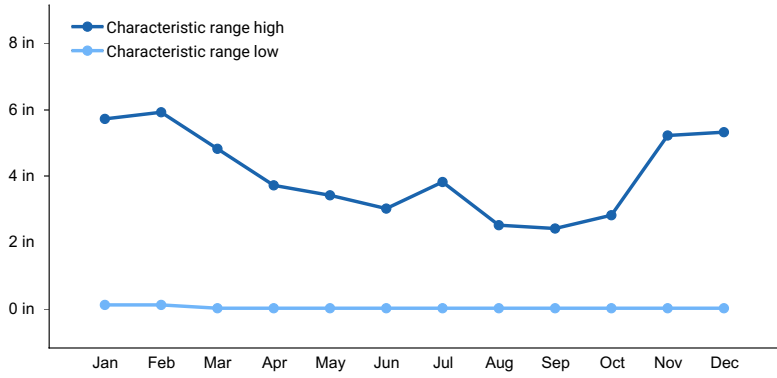


Figure 1. Monthly precipitation range

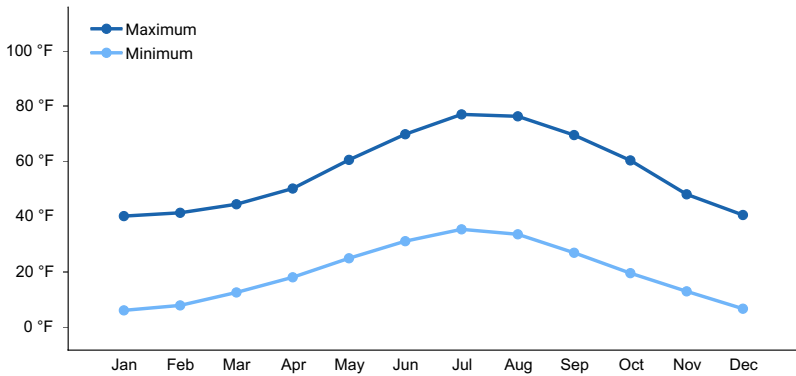


Figure 2. Monthly average minimum and maximum temperature

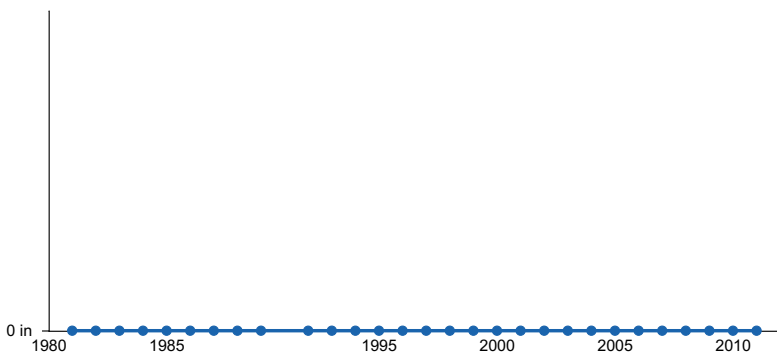


Figure 3. Annual precipitation pattern

Influencing water features

This site is influenced by perennial streams and drainageways. It experiences flooding and a seasonally high watertable possibly causing site degradation.

Soil features

The soils associated with this site are very deep and poorly to well drained. Flooding and a seasonally high water table within 12 to 36 inches of the surface during the early part of the growing season, supply additional moisture for plant growth. During the summer and fall months, the water table is at depths below 40 inches. These soils are susceptible to gullyng which intercepts normal overflow patterns causing site degradation. Runoff is very low to medium. The soil associated with this site include Fluvaquentic Endoaquolls, Fluvaquentic Haploxerolls, Fluvaquents, Fluventic Haploxerolls.

Table 4. Representative soil features

Parent material	(1) Alluvium
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Surface texture	(1) Very cobbly sandy loam (2) Gravelly loam (3) Very gravelly sandy loam (4) Very gravelly coarse sand
Family particle size	(1) Loamy
Drainage class	Poorly drained to well drained
Permeability class	Moderately slow to rapid
Soil depth	72–84 in
Surface fragment cover <=3"	12–35%
Surface fragment cover >3"	2–20%
Available water capacity (0-40in)	1.7–3.6 in
Calcium carbonate equivalent (0-40in)	0–2%
Electrical conductivity (0-40in)	0–2 mmhos/cm
Sodium adsorption ratio (0-40in)	0–5
Soil reaction (1:1 water) (0-40in)	5.6–8.4
Subsurface fragment volume <=3" (Depth not specified)	30–51%
Subsurface fragment volume >3" (Depth not specified)	0–15%

Ecological dynamics

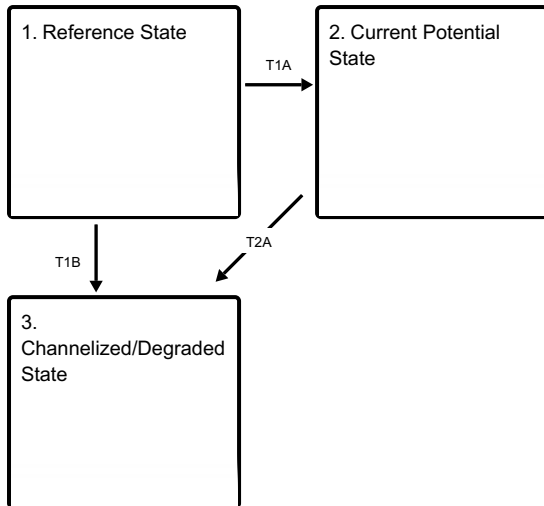
Where management results in overuse by livestock, big sagebrush and rubber rabbitbrush becomes prevalent. Redtop, Kentucky bluegrass, and foxtail barley are species likely to invade the site.

Fire Ecology:

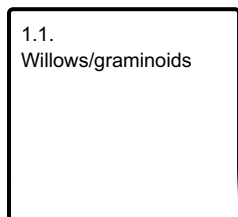
Fires are uncommon in riparian communities. Most fires kill only aboveground plant parts of willows. Generally yellow willow has the ability to sprout from its roots or stem base following fire. When found along a streamside, the high soil and fuel moisture content characteristic of this habitat reduces the chance of fire ignition and spread. Its numerous wind dispersed seeds are important in revegetating areas following fire generally yellow willow will sprout from its roots or stem base following fire. It shows better recovery from quick hot fires, as slow burns are more damaging to plants (apparently burning down into the roots). A prolific seeder, off-site plants are important in revegetating burned areas through the dispersal of numerous wind and water transported seeds. Silver buffaloberry is probably killed by severe fires. Silver buffaloberry has fair tolerance to fire in the dormant state and sprouts from rootstocks following fire. Wood's rose is typically top-killed by fire. Wood's rose is moderately fire tolerant and is usually favored by low-severity fire. It can persist after low to moderate severity fire because of its ability to sprout from undamaged or buried root crowns and rhizomes. The shallow root crowns of Wood's rose are susceptible to injury, and populations consequently decrease following high-severity fire. It occasionally germinated from on-site and off-site seed sources after fire. Creeping wildrye is top-killed by fire. Creeping wildrye is generally tolerant of fire but may be damaged by early season fire combined with dry soil conditions. Nevada bluegrass is generally unharmed by fire. It produces little litter, and its small bunch size and sparse litter reduces the amount of heat transferred to perennating buds in the soil.

State and transition model

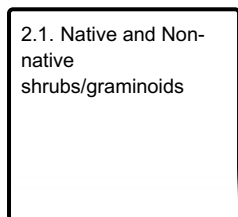
Ecosystem states



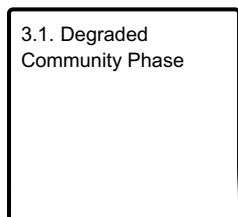
State 1 submodel, plant communities



State 2 submodel, plant communities



State 3 submodel, plant communities



State 1 Reference State

The Reference State has one main community phase. The community phase is dominated by willow, grasses, grass-like, and other shrubs.

Community 1.1 Willows/graminoids

The reference plant community is dominated by yellow willow. Willows dominate the visual aspect of this site. Silver buffaloberry is a common plant, and typically occurs intermingled within the yellow willow overstory. Dominant plants of the willow understory are creeping wildrye and Nevada bluegrass. Other important plants are basin wildrye, rushes, and sedges. Potential vegetative composition is about 35% grasses, 5% forbs, and 60% shrubs and tree-like shrubs and trees. Approximate ground cover (basal and crown) is 70 to 85 percent.

Table 5. Annual production by plant type

Plant Type	Low (Lb/Acre)	Representative Value (Lb/Acre)	High (Lb/Acre)
Shrub/Vine	3000	3600	3900
Grass/Grasslike	1750	2100	2275
Forb	250	300	325
Total	5000	6000	6500

State 2

Current Potential State

The Current Potential State occurs after non-native plant species introduction. The species can range from trees, shrubs, to herbaceous. Russian olive, tamarisk, Kentucky bluegrass, and thistles are common non-native plants that can establish on this site.

Community 2.1

Native and Non-native shrubs/graminoids

Non-native trees, like Russian olive are present and may dominate the tree canopy. Tamarisk may also occur and take the place of native willows. Kentucky bluegrass is effective at invading wet to semiwet sites and may dominate the understory.

State 3

Channelized/Degraded State

The Channelized/Degraded state is characterized by a adjacent stream that has been channelized. Most seasonal floodwaters remain the in channel and do not inundate the flood plain. This reduces cottonwood recruitment and may reduce soil moisture on the site allowing species that are more tolerant to dry conditions to establish.

Community 3.1

Degraded Community Phase

The plant community at this phase may look like a drier ecological site with sagebrush or rabbitbrush. This phase may also be converted to a agricultural field or urban development.

Transition T1A

State 1 to 2

Introduction of non-native species.

Transition T1B

State 1 to 3

Reduced soil moisture and altered hydrology of the site. Urbanization and agriculture uses may be present.

Transition T2A

State 2 to 3

Reduced soil moisture and altered hydrology of the site. Urbanization and agriculture uses may be present.

Additional community tables

Table 6. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Lb/Acre)	Foliar Cover (%)
Grass/Grasslike					
1	Primary Perennial Grasses			1140–3060	
	beardless wildrye	LETR5	<i>Leymus triticoides</i>	600–1200	–
	sedge	CAREX	<i>Carex</i>	120–480	–
	basin wildrye	LECI4	<i>Leymus cinereus</i>	120–480	–
2	Secondary Perennial Grasses			120–480	
	tufted hairgrass	DECE	<i>Deschampsia cespitosa</i>	30–180	–
	slender wheatgrass	ELTR7	<i>Elymus trachycaulus</i>	30–180	–
	mat muhly	MURI	<i>Muhlenbergia richardsonis</i>	30–180	–
Forb					
3	Perennial			120–480	
	sedge	CAREX	<i>Carex</i>	120–480	–
	yarrow	ACHIL	<i>Achillea</i>	30–120	–
	aster	ASTER	<i>Aster</i>	30–120	–
	Rocky Mountain iris	IRMI	<i>Iris missouriensis</i>	30–120	–
	cinquefoil	POTEN	<i>Potentilla</i>	30–120	–
	ragwort	SENEC	<i>Senecio</i>	30–120	–
	clover	TRIFO	<i>Trifolium</i>	30–120	–
Shrub/Vine					
4	Primary Shrubs			3120–4800	
	yellow willow	SALU2	<i>Salix lutea</i>	2700–3600	–
	silver buffaloberry	SHAR	<i>Shepherdia argentea</i>	300–900	–
	basin wildrye	LECI4	<i>Leymus cinereus</i>	120–480	–
	Woods' rose	ROWO	<i>Rosa woodsii</i>	120–300	–
5	Secondary Shrubs			120–600	
	silver sagebrush	ARCA13	<i>Artemisia cana</i>	60–180	–
	big sagebrush	ARTR2	<i>Artemisia tridentata</i>	60–180	–
	dwarf fleabane	ERNA5	<i>Erigeron nanus</i>	60–180	–
	currant	RIBES	<i>Ribes</i>	60–180	–
	narrowleaf willow	SAEX	<i>Salix exigua</i>	60–180	–
	mat muhly	MURI	<i>Muhlenbergia richardsonis</i>	8–45	–

Animal community

Livestock Interpretations:

This site is suited to livestock grazing. Grazing management should be keyed to creeping wildrye and Nevada bluegrass. Creeping wildrye can be used for forage and is very palatable to all livestock. Once established it is very rhizomatous and maintains stands for many years. Bluegrass is a widespread forage grass. It is one of the earliest grasses in the spring and is sought by domestic livestock and several wildlife species. Nevada bluegrass is a palatable species, but its production is closely tied to weather conditions. It produces little forage in drought years, making it a less dependable food source than other perennial bunchgrasses. Yellow willow occurs in riparian habitats which these animals. They are considered to be more palatable to sheep, although cattle may make greater use of willow as they tend to frequent riparian areas. Yellow willow is universally browsed by livestock. Silver buffaloberry is nearly worthless as livestock forage due to its thornlike twigs. Silver buffaloberry is fair forage for sheep. Forage production under dense, thorny, monotypic stands of silver buffaloberry is low; as stands open up, forage production increases due to invasion by Kentucky bluegrass.

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:

Dense stands of yellow willow provide excellent thermal and hiding cover for many wildlife species. Songbirds frequently use trees for nesting. Silver buffaloberry is a valuable forage species for mule deer, and pronghorn. Creeping wildrye is used for forage for many wildlife species and is often used for cover. Nevada bluegrass is also an important forage species for several wildlife species.

Hydrological functions

Runoff is very low to medium. Permeability is moderately slow to rapid.

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

All willows produce salicin, which chemically, is closely related to acetylsalicylic acid commonly known as aspirin. Native Americans used various preparations from willows to treat toothache, stomach ache, diarrhea, dysentery, and dandruff. Native Americans also used the stems for basketry and bow making, and the bark for tea and fabric making. The fruit of Silver buffaloberry is used to make pies, jams, and jellies. Silver buffaloberry is planted as an ornamental.

Native Americans made extensive use of Wood's rose roots, stems, leaves, flowers, and hips for foods and therapeutic materials. The hips are a source of vitamin C and are dried for use in flavoring teas, jellies, fruitcakes and puddings. Wood's rose is used as an ornamental near homes to attract birds and other wildlife.

Other information

Because of its soil binding properties and its close proximity to water, yellow willow holds together and helps stabilize streambanks, protecting the bank from erosion. Stands should therefore be maintained.

Silver buffaloberry adapts well to disturbed or degraded sites in the Intermountain region. It is used for multiple-row windbreaks, shelterbelts, erosion control, wildlife habitat enhancement, and land reclamation. Nursery-grown stock readily establishes on disturbed sites and once established, silver buffaloberry is a good soil stabilizer. Silver buffaloberry is used for erosion control in riparian areas in the Intermountain region. Wood's rose extensive rhizomes, and good survivability and revegetation characteristics even on harsh sites makes this species an effective tool in erosion control. It has also been suggested as a useful species for revegetation on high pH and lime soils. Wood's rose is used to revegetate disturbed sites along streambanks and seeps. Creeping wildrye is primarily used for reclamation of wet, saline soils.

Inventory data references

NASIS data for soil survey areas NV773, NV625, NV628, NV629, NV772, NV774, NV799.

Type locality

Location 1: Lyon County, NV	
Township/Range/Section	T11N R22E S12
General legal description	N1/2 Section 12, T11N. R22E. MDBM. Along perennial stream in Red Canyon (Douglas County), about 6 miles northwest of Wellington, Lyon County, Nevada.

Other references

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

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

Contributors

DK/GD

Approval

Kendra Moseley, 4/10/2024

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	04/25/2024
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:**
