

Ecological site R026XY108NV

ASHY SLOPE 14-16 P.Z.

Last updated: 4/10/2024
Accessed: 10/01/2026

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 Bodie Hills LRU straddles the California-Nevada state boundary, just north of Mono Lake. The area is underlain by late Miocene age volcanic fields with upper Miocene and Pliocene sedimentary deposits over top. The youngest faults in the area are north and north-east striking. Extensive zones of hydrothermally altered rocks and large mineral deposits, including gold and silver rich veins, formed during hydrothermally active periods of the Miocene (John et al. 2015). A primary distinguishing factor between the Bodie Hills and other hills in MLRA 26 is the dominance of volcanic parent material. Elevations range from 2170 to 2650 meters and slopes typically range from 5 to 35 percent. FFD range from 75-105.

Ecological site concept

The Ashy Slope 14-16 P.Z. site occurs on mountain summits and shoulders having a smooth to slightly concave shape. The soils associated with this site are very deep, well drained soils that formed in eolian volcanic ash and colluvium derived from andesite or tuff

breccia. The dominant vegetation is mountain sagebrush (*Artemisia tridentata* ssp. *vaseyana*), western needlegrass (*Achnatherum occidentale* ssp. *occidentale*), and basin wildrye (*Leymus cinereus*).

Associated sites

R026XF060CA	Ashy Claypan 12-14 P.Z.
R026XY105NV	GRAVELLY LOAMY SLOPE 14-16 P.Z.

Similar sites

R026XY038NV	LOAMY SLOPE 14+ P.Z. More productive site.
R026XY084NV	DEEP LOAMY 14+ P.Z. PONE3 codominant species; more productive site.
R026XY112NV	ASHY POCKET Carex important species.

Table 1. Dominant plant species

Tree	Not specified
Shrub	(1) <i>Artemisia tridentata</i> ssp. <i>vaseyana</i>
Herbaceous	(1) <i>Achnatherum occidentale</i> ssp. <i>occidentale</i> (2) <i>Leymus cinereus</i>

Physiographic features

The Ashy Slope 14-16 P.Z. site occurs on mountain summits and shoulders having a smooth to slightly concave shape. Slopes range from 2 to 30 percent. Elevations are 7200 to 10200 feet.

Table 2. Representative physiographic features

Landforms	(1) Mountain slope (2) Mountain
Elevation	2,200 – 3,110 m
Slope	0 – 30 %

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. The mean annual precipitation is 14 to 16 inches, the mean annual temperature is 42 to 45 degrees F., and the frost-free period is 50 to 70 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)	360-410 mm
Frost-free period (average)	60 days
Freeze-free period (average)	
Precipitation total (average)	380 mm

Influencing water features

There are no influencing water features associated with this site.

Soil features

The soils associated with this site are very deep, well drained soils that formed in eolian volcanic ash and colluvium derived from andesite or tuff breccia. Rock fragments in the control section average 30 to 50 percent, and are mainly gravels. The soil moisture is usually moist in the moisture control section during late fall, winter, and spring; and dry from July through early October for 75 to 90 consecutive days in the four months following the summer solstice. The moisture regime is xeric that borders on aridic. The temperature regime is cryic. The soils have an argillic horizon and a mollic epipedon. Soil series associated with this site include Ashflat and Lastsummer.

Table 4. Representative soil features

Parent material	(1) Colluvium – andesite (2) Colluvium – tuff breccia
Surface texture	(1) Gravelly, ashy sandy loam (2) Gravelly, ashy fine sandy loam
Family particle size	(1) Ashy-skeletal over loamy-skeletal
Drainage class	Well drained
Permeability class	Moderate to moderately rapid
Soil depth	180 cm
Surface fragment cover $\leq 3"$	30 %
Surface fragment cover $> 3"$	Not specified
Available water capacity (0-101.6cm)	14.22 – 20.32 cm
Calcium carbonate equivalent (0-101.6cm)	Not specified
Electrical conductivity (0-101.6cm)	Not specified
Sodium adsorption ratio (0-101.6cm)	Not specified
Soil reaction (1:1 water) (0-101.6cm)	5.6 – 10
Subsurface fragment volume $\leq 3"$ (Depth not specified)	30 – 40 %

Subsurface fragment volume >3" (Depth not specified)	0 – 20 %
---	----------

Ecological dynamics

Nutrients are being cycled through deep-rooted perennial grasses, shrubs and forbs. Energy capture occurs throughout the entire growing season such that this plant community's site resiliency is maintained. With a lengthened fire return interval (>30 years) an increase in sagebrush cover occurs until mountain big sagebrush dominates resource use. This results in a decrease in cover, vigor and reproduction of the perennial bunchgrasses. Douglas rabbitbrush, roundleaf snowberry and other woody plants will also increase in prevalence.

Fire Ecology:

Presettlement fire return intervals in mountain big sagebrush communities varied from 15 to 25 years. Mountain big sagebrush is highly susceptible to injury from fire. Plants are readily killed in all seasons, even light severity fires. Mountain big sagebrush plants top-killed by fire will not resprout.

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.

State and Transition Model Narrative Group 13

This is a text description of the states, phases, transitions, and community pathways possible in the State and Transition model for the MLRA 26 Disturbance Response Group 13. Sites included in this DRG are: R026XY038NV, R026XY108NV, R026XY075NV, R026XY056NV, R026XY052NV, R026XY112NV, R026XY110NV, R026XF059CA.

Reference State 1.0:

The Reference State 1.0 represents the natural range of variability under pristine conditions. The reference state has three general community phases: a shrub-grass dominant phase, a perennial grass dominant phase and a shrub dominant phase. State dynamics are maintained by interactions between climatic patterns and disturbance regimes. Negative feedbacks enhance ecosystem resilience and contribute to the stability of the state. These include the presence of all structural and functional groups, fine fuel loads, and retention of organic matter and nutrients. Plant community phase changes are primarily driven by fire, periodic drought and/or insect or disease attack.

Community Phase 1.1:

Mountain big sagebrush and perennial bunchgrasses co-dominate. Western needlegrass is the dominant grass species, however there may be several grass species present. Grass, shrub, and forb diversity is high.

Community Phase Pathway 1.1a, from phase 1.1 to 1.2:

Fire would decrease or eliminate the overstory of sagebrush and allow perennial bunchgrasses and forbs to dominate the site. Fires are small, high-severity, stand replacement fires that typically occur from April through October. Patchy fires create a sagebrush/grass mosaic. High severity fire significantly reduces sagebrush cover and leads to an early- to mid-seral community, dominated by grasses and forbs.

Community Phase Pathway 1.1b, from phase 1.1 to 1.3:

Time and lack of disturbance such as fire or drought allow for an increase in mountain big sagebrush. Excessive herbivory and/or long-term drought may also reduce perennial understory.

Community Phase 1.2:

This community phase is characteristic of a post-disturbance, early- to mid-seral community. Western needlegrass, bluegrass and other perennial grasses dominate. Sprouting shrubs such as green rabbitbrush (*Chrysothamnus viscidiflorus*), snowberry (*Symphoricarpos oreophilus*), green ephedra (*Ephedra viridis*), spineless horsebrush (*Tetradymia canescens*) may be a significant component. Mountain big sagebrush is a minor component. Forbs may be a significant component.

Community Phase Pathway 1.2a, from phase 1.2 to 1.1:

Time and lack of disturbance allows sagebrush to reestablish.

Community Phase 1.3:

Mountain big sagebrush becomes dominant in the absence of disturbance. Western needlegrass and other perennial grasses are reduced. Bluegrass may increase. Singleleaf pinyon and/or Utah juniper may be present.

Community Phase Pathway 1.3a, from phase 1.3 to 1.1:

Low severity fire kills some sagebrush and results in a patchwork of shrubs and grasses.

Community Phase Pathway 1.3b, from phase 1.3 to 1.2:

High severity fire significantly reduces sagebrush cover, leading to early- to mid-seral community.

T1A: Transition from Reference State 1.0 to Current Potential State 2.0:

Trigger: This transition is caused by the introduction of non-native annual weeds, such as cheatgrass, mustard and Russian thistle (*Salsola* spp.).

Slow variables: Over time, the annual non-native plants will increase within the community decreasing organic matter inputs from deep-rooted perennial bunchgrasses resulting in reductions in soil water availability for perennial bunchgrasses.

Threshold: Any amount of introduced non-native species causes an immediate decrease in the resilience of the site. Annual non-native species cannot be easily removed from the system and have the potential to significantly alter disturbance regimes from their historic range of variation.

T2A: Transition from Reference State 1.0 to Shrub State 3.0:

Trigger: Inappropriately managed, long-term grazing of perennial bunchgrasses during the growing season would favor shrubs and initiate transition to Community Phase 3.1. Fire would cause a transition to Community Phase 3.2.

Slow variables: Long-term decrease in deep-rooted perennial grass density resulting in a decrease in organic matter inputs and subsequent soil water decline.

Threshold: Loss of deep-rooted perennial bunchgrasses changes spatial and temporal nutrient cycling and nutrient redistribution and reduces soil organic matter.

Current Potential State 2.0:

This state is similar to the Reference State 1.0. Ecological function has not changed, however the resiliency of the state has been reduced by the presence of invasive weeds. This state has the same three general community phases. Negative feedbacks enhance ecosystem resilience and contribute to the stability of the state. These include the presence of all structural and functional groups, fine fuel loads and retention of organic matter and nutrients. Positive feedbacks decrease ecosystem resilience and stability of the state. These include the non-natives high seed output, persistent seed bank, rapid growth rate, ability to cross pollinate and adaptations for seed dispersal. Additionally, the presence of highly flammable, non-native species reduces State resilience because these species can promote fire where historically fire has been infrequent leading to positive feedbacks that further the degradation of the system.

Community Phase 2.1:

Mountain big sagebrush and perennial bunchgrasses co-dominate. Western needlegrass is the dominant grass species; however, there may be several grass species present. Grass, shrub, and forb diversity is high. Annual non-native species present.

Community Phase Pathway 2.1a, from phase 2.1 to 2.2:

Fire would decrease or eliminate the overstory of sagebrush and allow perennial bunchgrasses and forbs to dominate the site. Fires would typically be small, high-severity, stand replacing, and patchy due to fine fuel loads. Patchy fires create a sagebrush/grass mosaic. High severity fire significantly reduces sagebrush cover and leads to an early- to mid-seral community, dominated by grasses and forbs.

Community Phase Pathway 2.1b, from phase 2.1 to 2.3:

Time, long-term drought, grazing management that favors shrubs or combinations of these allows the sagebrush overstory to increase and dominate the site, causing a reduction in perennial bunchgrasses.

Community Phase 2.2:

This community phase is characteristic of a post-disturbance, early- to mid-seral community. Western needlegrass, bluegrass and other perennial grasses dominate. Sprouting shrubs such as green rabbitbrush (*Chrysothamnus viscidiflorus*), snowberry (*Symphoricarpos oreophilus*), green ephedra (*Ephedra viridis*), spineless horsebrush (*Tetradymia canescens*) may be a significant component. Mountain big sagebrush is a minor component. Forbs may be a significant component. Annual non-native species are present.

Community Phase Pathway 2.2a, from phase 2.2 to 2.1:

Absence of disturbance over time allows the sagebrush to recover. This may be combined with grazing management that favors shrubs.

Community Phase 2.3:

Mountain big sagebrush increases and the perennial understory is reduced. Squirreltail and bluegrasses may increase. Annual non-native species are present.

Community Phase Pathway 2.3a, from phase 2.3 to 2.1:

Low severity fire kills some sagebrush and results in a patchwork of shrubs and grasses. Other disturbances/practices include brush management with minimal soil disturbance to reduce sagebrush cover.

Community Phase Pathway 2.3b, from phase 2.3 to 2.2

High severity fire significantly reduces sagebrush cover leading to early/mid-seral community.

T2A: Transition from Current Potential State 2.0 to Shrub State 3.0:

Trigger: Inappropriately managed, long-term grazing of perennial bunchgrasses during the growing season would favor shrubs and initiate transition to Community Phase 3.1. Fire would cause a transition to Community Phase 3.2.

Slow variables: Long-term decrease in deep-rooted perennial grass density resulting in a decrease in organic matter inputs and subsequent soil water decline.

Threshold: Loss of deep-rooted perennial bunchgrasses changes spatial and temporal nutrient cycling and nutrient redistribution, and reduces soil organic matter.

Shrub State 3.0:

This state has two community phases: a mountain big sagebrush dominated phase and a rabbitbrush dominated phase. This state is a product of many years of heavy grazing during time periods harmful to perennial bunchgrasses. Squirreltail and bluegrasses will increase with a reduction in deep-rooted perennial bunchgrass competition and become the dominant grass. Sagebrush dominates the overstory and rabbitbrush may be a significant component. Sagebrush canopy cover is high and sagebrush may be decadent, reflecting stand maturity and lack of seedling establishment due to competition with mature plants. The shrub overstory and shallow-rooted understory dominate site resources such that soil water, nutrient capture, nutrient cycling and soil organic matter are temporally and spatially redistributed.

Community Phase 3.1:

Mountain big sagebrush dominates the overstory. Western needlegrass and other deep-rooted perennial grasses are reduced or missing. Bluegrasses may dominate the understory. Bare ground may be significant. Annual non-native species are present.

Community Phase Pathway 3.1a, from phase 3.1 to 3.2:

Fire reduces or eliminates the overstory of sagebrush.

Community Phase 3.2:

Bluegrasses dominate the site. Rabbitbrush, bitterbrush, horsebrush, ephedra, and/or snowberry may be sprouting. Mountain big sagebrush is a minor component. Annual non-native species increasing and may be co-dominant in the understory.

Community Phase Pathway 3.2a, from phase 3.2 to 3.1:

Absence of disturbance over time allows sagebrush and other shrubs to recover.

State and transition model

Figure 5. R026XY108NV STM. Image is labeled incorrectly.

Additional community tables

Table 5. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
Grass/Grasslike					
1	Primary Perennial Grasses/Grass-likes			179-353	
	western needlegrass	ACOCO	<i>Achnatherum occidentale ssp. occidentale</i>	140-224	–
	basin wildrye	LECI4	<i>Leymus cinereus</i>	28-56	–
	sedge	CAREX	<i>Carex</i>	11-45	–
2	Secondary Perennial Grasses			28-84	
	Indian ricegrass	ACHY	<i>Achnatherum hymenoides</i>	2-17	–
	big squirreltail	ELMU3	<i>Elymus multisetus</i>	2-17	–
	needle and thread	HECO26	<i>Hesperostipa comata</i>	3-17	–
	spike fescue	LEKI2	<i>Leucopoa kingii</i>	2-17	–
	oniongrass	MEBU	<i>Melica bulbosa</i>	2-17	–
	bluegrass	POA	<i>Poa</i>	2-17	–
Forb					
3	Perennial Forbs			28-56	

	rockcress	ARAB12	<i>Arabis</i>	3-11	–
	tapertip hawksbeard	CRAC2	<i>Crepis acuminata</i>	3-11	–
	buckwheat	ERIOG	<i>Eriogonum</i>	3-11	–
	lupine	LUPIN	<i>Lupinus</i>	3-11	–
	phlox	PHLOX	<i>Phlox</i>	3-11	–
Shrub/Vine					
4	Primary Shrubs			84-224	
	mountain big sagebrush	ARTRV	<i>Artemisia tridentata ssp. vaseyana</i>	84-224	–
	spike fescue	LEKI2	<i>Leucopoa kingii</i>	3-17	–
	purple oniongrass	MESP	<i>Melica spectabilis</i>	3-17	–
5	Secondary Shrubs			28-56	
	yellow rabbitbrush	CHVI8	<i>Chrysothamnus viscidiflorus</i>	3-11	–
	antelope bitterbrush	PUTR2	<i>Purshia tridentata</i>	3-11	–
	wax currant	RICE	<i>Ribes cereum</i>	3-11	–
	roundleaf snowberry	SYRO	<i>Symphoricarpos rotundifolius</i>	3-11	–

Animal community

Livestock Interpretations: This site is suitable for livestock grazing. Grazing management should be keyed to dominant perennial grasses or palatable shrub production. Western needlegrass has a spreading and deeply penetrating root system, which makes it resistant to trampling. 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. Sedge provides good to fair forage for domestic grazing. 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. 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: Western needlegrass provides valuable forage for many species of wildlife. 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. Sedges have a high to moderate resource value for elk and a medium value for mule deer. Elk consume beaked sedge later in the growing season. 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.

Hydrological functions

Runoff is medium. Permeability is moderately slow.

Recreational uses

This site offers opportunities for hiking, camping, hunting and photography.

Other products

Basin wildrye was used as bedding for various Native American ceremonies, providing a cool place for dancers to stand. 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.

Other information

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.

Type locality

Location 1: Mono County, CA	
Township/Range/Section	T6N R26E S25
Latitude	38° 20' 6"
Longitude	119° 4' 42"
General legal description	On the Toiyabe National Forest, approximately 2.7 miles southeast of the Masonic Townsite.

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

ALM
Tamzen Stringham
Patti Novak -Echenique

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	10/01/2026
Approved by	
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:
