

Ecological site R025XY062NV STREAM TERRACE

Last updated: 4/25/2024
Accessed: 05/19/2024

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): 025X—Owyhee High Plateau

MLRA Notes 25—Owyhee High Plateau

This area is in Nevada (56 percent), Idaho (30 percent), Oregon (12 percent), and Utah (2 percent). It makes up about 27,443 square miles. MLRA 25 is characteristically cooler and wetter than the neighboring MLRAs of the Great Basin. The western boundary is marked by a gradual transition to the lower and warmer basins of MLRA 24. The boundary to the south-southeast, with MLRA 28B, is marked by gradual changes in geology marked by an increased dominance of singleleaf pinyon and Utah juniper and a reduced presence of Idaho fescue. The boundary to the north, with MLRA 11, is a rapid transition from the lava plateau topography to the lower elevation Snake River Plain.

Physiography:

All of this area lies within the Intermontane Plateaus. The southern half is in the Great Basin section of the Basin and Range province. This part of the MLRA is characterized by isolated, uplifted fault-block mountain ranges separated by narrow, aggraded desert plains. This geologically older terrain has been dissected by numerous streams draining to the Humboldt River.

The northern half of the area lies within the Columbia Plateaus province. This part of the MLRA forms the southern boundary of the extensive Columbia Plateau basalt flows. Most of the northern half is in the Payette section, but the northeast corner is in the Snake River Plain section. Deep, narrow canyons draining into the Snake River have been incised into this broad basalt plain. Elevation ranges from 3,000 to 7,550 feet on rolling plateaus and in gently sloping basins. It is more than 9,840 feet on some steep mountains. The Humboldt River crosses the southern half of this area

Geology:

The dominant rock types in this MLRA are volcanic. They include andesite, basalt, tuff, and rhyolite. In the north and west parts of the area, Cretaceous granitic rocks are exposed among Miocene volcanic rocks in mountains. A Mesozoic igneous and metamorphic rock complex dominates the south and east parts of the area. Upper and Lower Paleozoic calcareous sediments, including oceanic deposits, are exposed with limited extent in the mountains. Alluvial fan and basin fill sediments occur in the valleys.

Climate:

The average annual precipitation in most of this area is typically 11 to 22 inches. It increases to as much as 49 inches at the higher elevations. Rainfall occurs in spring and sporadically in summer. Precipitation occurs mainly as snow in winter. The precipitation is distributed fairly evenly throughout fall, winter, and spring. The amount of precipitation is lowest from midsummer to early autumn. The average annual temperature is 33 to 51 degrees F. The freeze-free period averages 130 days and ranges from 65 to 190 days, decreasing in length with elevation. It is typically less than 70 days in the mountains.

Water:

The supply of water from precipitation and streamflow is small and unreliable, except along the Owyhee, Bruneau, and Humboldt Rivers. Streamflow depends largely on accumulated snow in the mountains. Surface water from mountain runoff is generally of excellent quality and suitable for all uses. The basin fill sediments in the narrow alluvial valleys between the mountain ranges provide some ground water for irrigation. The alluvial deposits along the large streams have the most ground water. Based on measurements of water quality in similar deposits in

adjacent areas, the basin fill deposits probably contain moderately hard water. The water is suitable for almost all uses. The carbonate rocks in this area are considered aquifers, but they are little used. Springs are common along the edges of the limestone outcrops.

Soils:

The dominant soil orders in this MLRA are Aridisols and Mollisols. The soils in the area dominantly have a mesic or frigid temperature regime and an aridic, aridic bordering on xeric, or xeric moisture regime. Soils with aquic moisture regimes are limited to drainage or spring areas, where moisture originates or runs on and through. These soils are of a very limited extent throughout the MLRA. They generally are well drained, clayey or loamy, and shallow or moderately deep. Most of the soils formed in mixed parent material. Volcanic ash and loess mantle the landscape. Surface soil textures are loam and silt loam with ashy texture modifiers in some areas. Argillic horizons occur on the more stable landforms. They are exposed nearer the soil surface on convex landforms, where ash and loess deposits are more likely to erode. Soils that formed in carbonatic parent material in areas that receive less than 12 inches of precipitation are characterized by calcic horizons throughout the profile, while soils in areas that receive more than 12 inches of precipitation do not have calcic horizons in the upper part of the profile. Soils that formed on stable landforms at the lower elevations are dominated by ochric horizons. Soils that formed at the middle and upper elevations are characterized by mollic epipedons. Soils in drainage areas at all elevations that receive moisture running on or through them are characterized by thicker mollic epipedons.

Biological Resources:

This MLRA supports shrub-grass vegetation. Lower elevations are characterized by Wyoming big sagebrush associated with bluebunch wheatgrass, western wheatgrass, and Thurber's needlegrass. Other important plants include bluegrass, squirreltail, penstemon, phlox, milkvetch, lupine, Indian paintbrush, aster, and rabbitbrush. Black sagebrush occurs but is less extensive. Singleleaf pinyon and Utah juniper occur in limited areas. With increasing elevation and precipitation, vast areas characterized by mountain big sagebrush or low sagebrush/early sagebrush in association with Idaho fescue, bluebunch wheatgrass, needlegrasses, and bluegrass become common. Snowberry, curl-leaf mountain mahogany, ceanothus, and juniper also occur. Mountains at the highest elevations support whitebark pine, Douglas-fir, limber pine, Engelmann spruce, subalpine fir, aspen, and curl-leaf mountain mahogany.

Major wildlife species include mule deer, bighorn sheep, pronghorn, mountain lion, coyote, bobcat, badger, river otter, mink, weasel, golden eagle, red-tailed hawk, ferruginous hawk, Swainson's hawk, northern harrier, prairie falcon, kestrel, great horned owl, short-eared owl, long-eared owl, burrowing owl, pheasant, sage grouse, chukar, gray partridge, and California quail. Reptiles and amphibians include western racer, gopher snake, western rattlesnake, side-blotched lizard, western toad, and spotted frog. Fish species include bull, red band, and rainbow trout.

Ecological site concept

This site occurs on stream terraces. Slopes range from 0 to 2 percent. Elevations are 5000 to 6500 feet. The average growing season is about 70 to 100 days.

The soils associated with this site are very deep, somewhat poorly drained and derived from mixed alluvium. Available water holding capacity is high. Permeability is moderate (0.6 to 2.0 in/hr). These soils have seasonally high water table at depths of 30 to 40 inches. The pH for these soils is strongly alkaline (8.5 to 9.0). The mean annual temperature is 49 to 54 degrees F and the frost free period is 90 to 100 days.

The reference plant community is dominated by shrubby cinquefoil, purple reedgrass and western wheatgrass.

Associated sites

R025XY027NV	LOAMY 12-14 P.Z.
R025XY046NV	FRACTURED STONY LOAM 14+ P.Z.
R028BY014NV	LOAMY PLAIN 8-10 P.Z.
R028BY018NV	SILTY 5-8 P.Z.

Similar sites

R028BY012NV	WET SALINE MEADOW PASM dominant grass; POFR4 not present
R028BY099NV	WET ALKALI MEADOW CACAM dominant, site more productive; POFR4 not present

Table 1. Dominant plant species

Tree	Not specified
Shrub	(1) <i>Dasiphora floribunda</i>
Herbaceous	(1) <i>Calamagrostis purpurascens</i> (2) <i>Pascopyrum smithii</i>

Physiographic features

The Stream Terrace site occurs on stream terraces. Slopes range from 0 to 2 percent. Elevations are 5000 to 6500 feet.

Table 2. Representative physiographic features

Landforms	(1) Stream terrace
Runoff class	High
Flooding frequency	None
Ponding frequency	None
Elevation	5,000–6,500 ft
Slope	0–2%
Water table depth	20–40 in
Aspect	Aspect is not a significant factor

Climatic features

The climate associated with this site is semiarid, characterized by cold, moist winters and warm, dry summers. The average annual precipitation ranges from 8 to 10 inches. Mean annual air temperature is about 45 to 50 degrees F.

Mean annual precipitation across the range in which this ES occurs is 9.85".

Monthly mean precipitation: January 1.00"; February 0.72"; March 0.87"; April 0.79"; May 1.32"; June 1.06"; July 0.47"; August 0.53"; September 0.59"; October 0.70"; November 0.84"; December 0.96".

*The above data is averaged from the Elko AP and Contact WRCC climate stations.

Frost free days (>32): 89.5

Freeze free days (>28): 120.5

Table 3. Representative climatic features

Frost-free period (characteristic range)	53-61 days
Freeze-free period (characteristic range)	93-97 days
Precipitation total (characteristic range)	10 in
Frost-free period (actual range)	51-63 days
Freeze-free period (actual range)	91-99 days
Precipitation total (actual range)	10 in

Frost-free period (average)	57 days
Freeze-free period (average)	95 days
Precipitation total (average)	10 in

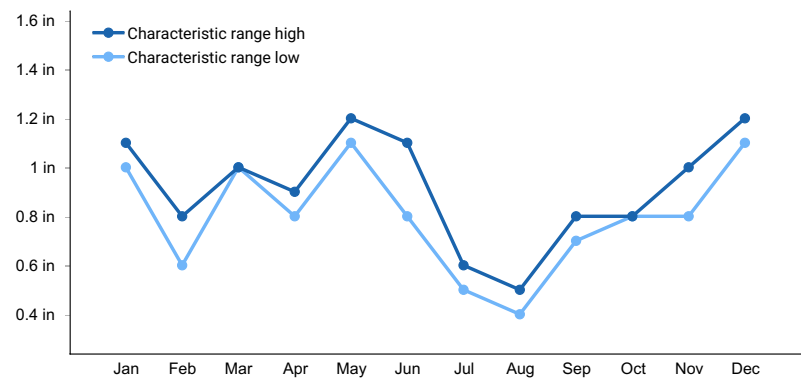


Figure 1. Monthly precipitation range

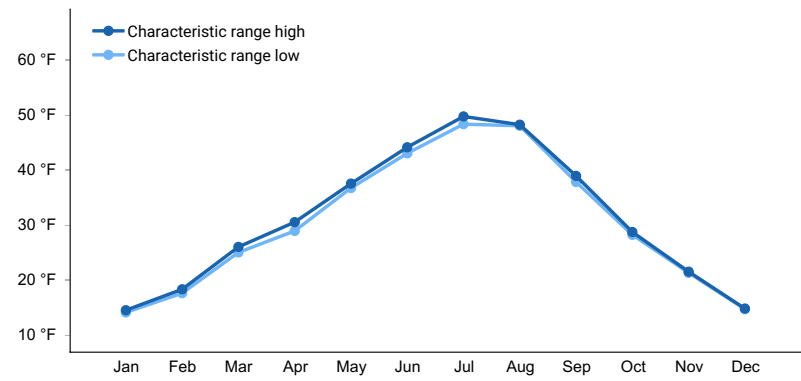


Figure 2. Monthly minimum temperature range

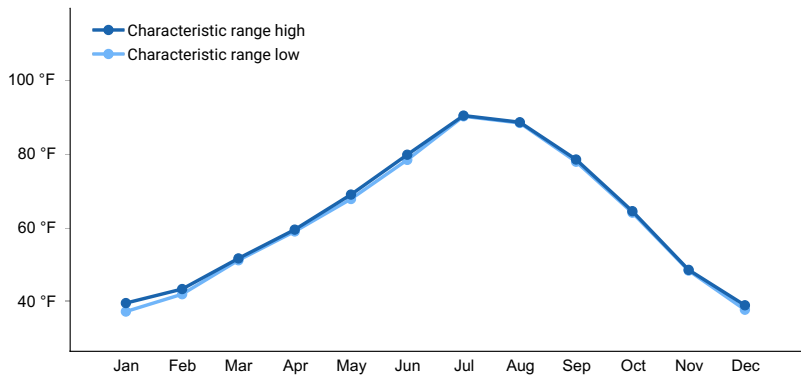


Figure 3. Monthly maximum temperature range

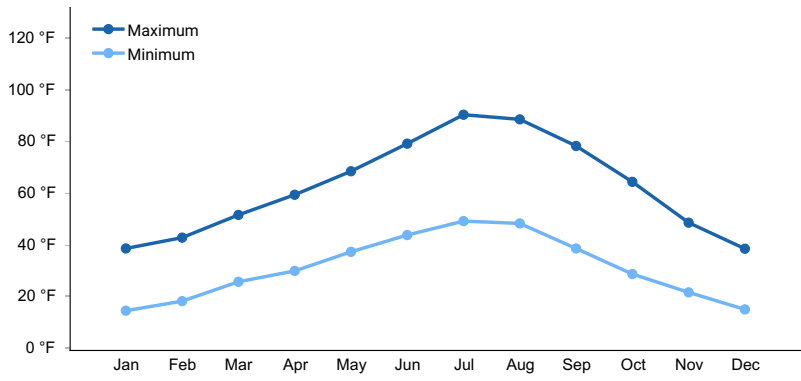


Figure 4. Monthly average minimum and maximum temperature

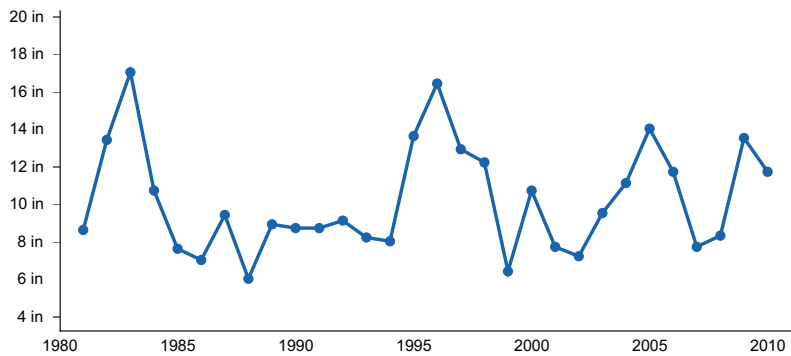


Figure 5. Annual precipitation pattern

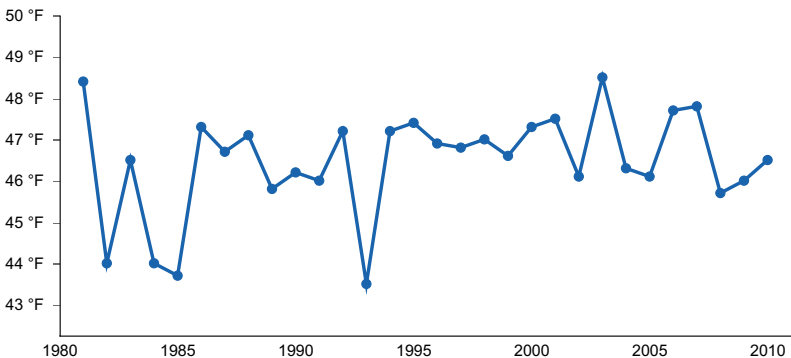


Figure 6. Annual average temperature pattern

Climate stations used

- (1) CONTACT [USC00261905], Jackpot, NV
- (2) ELKO RGNL AP [USW00024121], Elko, NV

Influencing water features

This site is influenced by a seasonally high water table.

Soil features

The soils associated with this site are very deep, somewhat poorly drained and derived from mixed alluvium. Available water holding capacity is high. Permeability is moderate (0.6 to 2.0 in/hr). These soils have seasonally high water table at depths of 30 to 40 inches. The pH for these soils is strongly alkaline (8.5 to 9.0). The mean annual temperature is 49 to 54 degrees F and the frost free period is 90 to 100 days.

Soil series correlated with this site is: Lykal

Table 4. Representative soil features

Parent material	(1) Alluvium
Surface texture	(1) Silt loam
Family particle size	(1) Coarse-silty
Drainage class	Somewhat poorly drained to poorly drained
Permeability class	Moderate
Depth to restrictive layer	72 in
Soil depth	72 in
Surface fragment cover <=3"	0–15%

Surface fragment cover >3"	0–15%
Available water capacity (0-40in)	7.2–8 in
Calcium carbonate equivalent (0-40in)	35–45%
Electrical conductivity (0-40in)	0–2 mmhos/cm
Sodium adsorption ratio (0-40in)	1–5
Soil reaction (1:1 water) (0-40in)	7.2–8.4
Subsurface fragment volume <=3" (Depth not specified)	0–15%
Subsurface fragment volume >3" (Depth not specified)	0–15%

Ecological dynamics

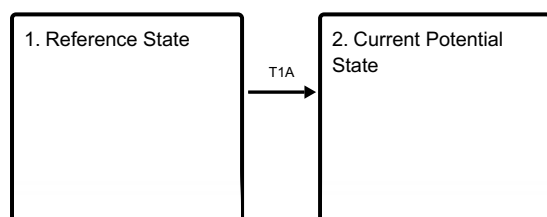
As ecological condition declines, black greasewood and rush increase. as purple reedgrass and western wheatgrass decrease.

Fire effects:

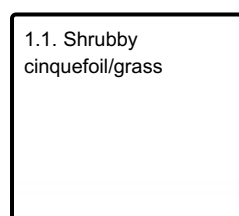
Shrubby cinquefoil is susceptible to damage by fire, however, if the root crown remains undamaged individual plants readily resprout. They also reestablish from off-site seed sources. Fire occurs infrequently on many shrubby cinquefoil sites; some areas are too moist to carry fire or lack sufficient fuels to carry fire. Fire will kill aboveground vegetation of purple reedgrass. Severe fires may kill belowground rhizomes. Reestablishment on burn sites occurs from wind-dispersed seeds and purple reedgrass can also resprout from surviving rhizomes. 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. Recovery takes about 2 to 5 years after a fire.

State and transition model

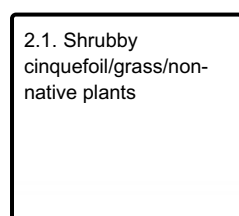
Ecosystem states



State 1 submodel, plant communities



State 2 submodel, plant communities



State 1

Reference State

The Reference State is a representative of the natural range of variability under pristine conditions. The reference state has three general community phases; a shrub-grass dominant phase, and a shrub dominant phase and a grass 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, low fine fuel loads, and retention of organic matter and nutrients. Plant community phase changes are primarily driven by water table dynamics.

Community 1.1

Shrubby cinquefoil/grass

The reference plant community is dominated by shrubby cinquefoil, purple reedgrass and western wheatgrass. Potential vegetative composition is about 55 percent grasses, 10 percent forbs and 35 percent shrubs. Approximate ground cover (basal and crown) is 40 to 50 percent.

Table 5. Annual production by plant type

Plant Type	Low (Lb/Acre)	Representative Value (Lb/Acre)	High (Lb/Acre)
Grass/Grasslike	330	440	550
Shrub/Vine	210	280	350
Forb	60	80	100
Total	600	800	1000

State 2

Current Potential State

This state is similar to the Reference State except there are non-native plants in the community.

Community 2.1

Shrubby cinquefoil/grass/non-native plants

The reference plant community is dominated by shrubby cinquefoil, purple reedgrass and western wheatgrass. Non-native plants have established in the community.

Transition T1A

State 1 to 2

Trigger: This transition is caused by the introduction of non-native annual plants. Slow variables: Over time the annual non-native species will increase within the community. 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.

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			312–664	
	purple reedgrass	CAPU	<i>Calamagrostis purpurascens</i>	160–320	–
	western wheatgrass	PASM	<i>Pascopyrum smithii</i>	80–160	–
	sedge	CAREX	<i>Carex</i>	40–80	–
	alkali sacaton	SPAI	<i>Sporobolus airoides</i>	16–64	–
	mat muhly	MURI	<i>Muhlenbergia richardsonis</i>	16–40	–
2	Secondary Perennial Grasses			16–40	
	thickspike wheatgrass	ELLA3	<i>Elymus lanceolatus</i>	4–16	–
	rush	JUNCU	<i>Juncus</i>	4–16	–
	bluegrass	POA	<i>Poa</i>	4–16	–
	alkaligrass	PUCCI	<i>Puccinellia</i>	4–16	–
Forb					
3	Primary Forbs			16–40	
	King's mousetail	IVKI	<i>Ivesia kingii</i>	16–40	–
	bluegrass	POA	<i>Poa</i>	4–16	–
	alkaligrass	PUCCI	<i>Puccinellia</i>	4–16	–
4	Secondary Forbs			16–64	
	alkali sacaton	SPAI	<i>Sporobolus airoides</i>	16–64	–
	common yarrow	ACMI2	<i>Achillea millefolium</i>	4–16	–
	shootingstar	DODEC	<i>Dodecatheon</i>	4–16	–
	horsetail	EQUIS	<i>Equisetum</i>	4–16	–
	Rocky Mountain iris	IRMI	<i>Iris missouriensis</i>	4–16	–
	plantain	PLANT	<i>Plantago</i>	4–16	–
Shrub/Vine					
5	Primary Shrubs			160–320	
6	Secondary Shrubs			16–40	
	rubber rabbitbrush	ERNA10	<i>Ericameria nauseosa</i>	4–16	–
	willow	SALIX	<i>Salix</i>	4–16	–
	greasewood	SAVE4	<i>Sarcobatus vermiculatus</i>	4–16	–

Animal community

Livestock Interpretations:

This site is suited for livestock grazing. Grazing management should be keyed to purple reedgrass and western wheatgrass. Early in the season this grass is grazed readily by all classes of livestock, but after midsummer it is grazed only lightly or moderately by cattle and horses. Western wheatgrass provides important forage for domestic sheep. Fall regrowth cures well on the stem, so western wheatgrass is a good winter forage for domestic livestock. Shrubby cinquefoil is of low palatability for livestock. Leaves have a coarse texture and astringent taste. Young seedlings are more palatable than mature plants. Shrubby cinquefoil is grazed in some areas by domestic goats, sheep, and cattle.

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:

Shrubby cinquefoil is of low palatability big game animals. Leaves have a coarse texture and astringent taste. Young seedlings are more palatable than mature plants, and the seeds are palatable to small mammals. Though it is not preferred forage for deer, shrubby cinquefoil is lightly browsed by mule deer, elk, mountain goats, and bighorn sheep throughout its range. Winter use of shrubby cinquefoil by deer and elk is also typically light. It is a low preference shrub for bighorn sheep, though it receives moderate to heavy use when new growth begins. Small birds and mammals consume shrubby cinquefoil seeds. Though it has low forage value, shrubby cinquefoil's widespread distribution, persistent leaves, and low spreading growth form make it an important source of forage for ungulates. Purple reedgrass is consumed by bighorn sheep. Western needlegrass is also an important forage species for several wildlife species.

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

The dried leaves of shrubby cinquefoil were commonly used by Native Americans to make tea. Dried leaves were also made into a mixture considered an arrow poison that was thought to go directly to the heart. Dried, finely powdered leaves were believed to protect the body from severe, temporary heat.

Other information

Shrubby cinquefoil is useful for erosion control and soil stabilization, and may be useful in wildlife habitat mitigation. Due to its virtually continuous summer blooming, shrubby cinquefoil is a valuable landscape ornamental, and is recommended for landscaping in deer winter range areas because it is seldom browsed. Western wheatgrass is a good soil binder and is well suited for reclamation of disturbed sites such as erosion control and soil stabilization.

Inventory data references

Soils and Physiographic features were gathered from NASIS.

Type locality

Location 1: Elko County, NV	
Township/Range/Section	T32N R60E S18
General legal description	Ruby Valley, Elko County, Nevada.

Other references

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

Houghton, J.G., C.M. Sakamoto, and R.O. Gifford. 1975. Nevada's Weather and Climate, Special Publication 2. Nevada Bureau of Mines and Geology, Mackay School of Mines, University of Nevada, Reno, NV.

National Oceanic and Atmospheric Administration. 2004. The North American Monsoon. Reports to the Nation. National Weather Service, Climate Prediction Center. Available online: <http://www.weather.gov/>

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

Contributors

RL

Approval

Kendra Moseley, 4/25/2024

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)	PATTI NOVAK-ECHENIQUE
Contact for lead author	State Rangeland Management Specialist
Date	05/02/2013
Approved by	Kendra Moseley
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

Indicators

1. **Number and extent of rills:** Rills are none.

2. **Presence of water flow patterns:** Water flow patterns are none.

3. **Number and height of erosional pedestals or terracettes:** Pedestals are none.

4. **Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):** Bare Ground ± 5-15%.

5. **Number of gullies and erosion associated with gullies:** None

6. **Extent of wind scoured, blowouts and/or depositional areas:** None

7. **Amount of litter movement (describe size and distance expected to travel):** Fine litter (foliage of grasses and annual & perennial forbs) only expected to move during periods of flooding by adjacent streams. Persistent litter (large woody material) will remain in place except during flooding events.

8. **Soil surface (top few mm) resistance to erosion (stability values are averages - most sites will show a range of values):** Soil stability values will range from 4 to 6. (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):** Soil surface structure is subangular blocky, medium platy, or granular. Soil surface colors are dark and the soils have thick mollic epipedons. Organic matter can range from 2 to 3 percent for much of the upper 20 inches.
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10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:** Deep-rooted perennial grasses and/or rhizomatous grass-like (i.e. rush) slow runoff and increase infiltration.
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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 none. Subangular blocky or massive subsurface layers are not to be interpreted as compaction.
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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: Deep-rooted, perennial bunchgrasses and grass-like plants > rhizomatous grasses and grass-like
- Sub-dominant: Associated shrubs > deep-rooted, cool season, perennial forbs = fibrous, shallow-rooted, cool season, annual and perennial forbs.
- Other:
- Additional:
-
13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):** Little to no decadence present.
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14. **Average percent litter cover (%) and depth (in):** Between plant interspaces (30-40%) and litter depth is > ¼ 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 (through June) ± 800 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:** Potential invaders include thistle, knapweeds, tall whitetop (perennial pepperweed), and salt cedar.
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17. **Perennial plant reproductive capability:** All functional groups should reproduce in most years.
