

Ecological site R027XY093NV

STONY TERRACE 4-8 P.Z.

Last updated: 6/03/2024
Accessed: 09/19/2026

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): 027X–Fallon-Lovelock Area

Physiography Found in the Great Basin Section of the Basin and Range Province of the Intermontane Plateaus this area is characterized by isolated uplifted fault block mountain ranges trending north to south that are separated by broad, hydrologically closed basins. The entire area occurs in the rain-shadow of the Sierra Nevada mountains and is influenced by Pleistocene Lake Lahontan which reached its most recent high stand about 12,000 years ago. There is substantial evidence suggesting the western Great Basin has been the site of pluvial-interpluvial cycles for at least the past two million years. The mountains and valleys are dissected by the Humboldt, Truckee, Carson, and Walker Rivers and their tributaries, all of which terminate within MLRA 27. Extensive playas can be found throughout this area and are the result of drying of ancient Lake Lahontan. Elevation generally ranges from 3,300 to 5,900 feet (1,005 to 1,800 meters) in valleys, but on some mountain peaks it is more than 7,870 feet (2,400 meters). Geology Landforms and soils of this MLRA have been heavily influenced by fluctuating lake level over the last 40,000 years. There is a level line evident on the higher slopes marking the former extent of glacial Lake Lahontan. Almost half of this area has surface deposits of alluvial valley fill influenced by lacustrine sediment. The rest has andesite and basalt rocks of different ages. Mesozoic and Tertiary intrusives are concentrated along the western border of the area, and Lower Volcanic Rocks (17 to 43 million years old) are common on the eastern side of the area. Also, some scattered outcrops of Mesozoic sedimentary and volcanic rocks and tuffaceous sedimentary rocks are in the mountains within the interior of this MLRA. Climate The average annual precipitation is 5 to 10 inches (125 to 255 millimeters) in most of the area but is as much as 19 inches (485 millimeters) on high mountain slopes. Most of the rainfall occurs as high-intensity, convective thunderstorms during the growing season. The amount of precipitation is very low from summer to midautumn. The precipitation in winter occurs mainly as snow. The average annual temperature is 43 to 54 degrees F (6 to 12 degrees C). The freeze-free period averages 155 days and ranges from 110 to 195 days, decreasing in length with elevation. Water The amount of precipitation is very low, and water for irrigation is obtained principally from diversions on the four large rivers in the area and from water stored in the Lahontan, Rye Patch, and Weber Reservoirs. Pyramid Lake and Walker Lakes are terminal lakes for the Truckee and Walker Rivers, respectively. Much of the annual flow of both rivers is diverted for irrigation, causing lake levels to fall and levels of dissolved salts to increase causing problems for the native Lahontan cutthroat trout. Soils The dominant soil orders are Aridisols and Entisols. The soils in the area are predominantly a mesic temperature regime, aridic moisture regime, and have a mixed mineralogy. They are generally well drained, loamy or sandy, commonly skeletal, and shallow to very deep. Accumulation of salts, tufa deposits, and eolian sediments with soluble salts over lacustrine deposits influence most of the soils in the basin landforms of this MLRA. Soils on bedrock-controlled landforms are typically comprised of volcanic or tuffaceous sedimentary colluvium over residuum. Biological Resources This area supports extensive areas of salt-desert shrub vegetation. Shadscale and Bailey's greasewood are widespread, occurring both individually and together. Grasses are generally sparse, although Indian ricegrass is prominent, especially on the sandy soils. Fourwing saltbush, winterfat, spiny hopsage, wolfberry, ephedra, dalea, and bud sagebrush are common shrubs. Basin wildrye, creeping wildrye, alkali sacaton, saltgrass, black greasewood, rubber rabbitbrush, and big saltbush are important plants on saline bottom lands and terraces. A few marsh areas support cattail, bulrushes, sedges, and rushes. Big sagebrush, along with scattered Utah juniper and singleleaf pinyon, is associated with Thurber needlegrass, desert needlegrass, Sandberg bluegrass, and squirreltail on the higher elevation piedmont slopes and mountains.

Ecological site concept

The Stony Terrace 4-8 P.Z. site occurs on lake terraces associated with Lake Lahontan and other Pleistocene lakes. Slopes range from 4 to 15 percent. Elevations are 4100 to 4400 feet. The soils are very shallow to very deep and well drained. The soil surface is extremely cobbly. The site is moist for short periods in winter and early spring and dry in late spring through early fall.

Associated sites

R027XY018NV	GRAVELLY LOAM 4-8 P.Z. Found on associated fan remnants, alluvial fans, fan skirts, and lake terraces
--------------------	---

Similar sites

R027XY015NV	STONY LOAM 4-8 P.Z. SAVEB-ATCO dominant shrubs
R027XY017NV	SOUTH SLOPE 4-8 P.Z. ATCO dominant shrub.

Table 1. Dominant plant species

Tree	Not specified
Shrub	(1) <i>Ephedra nevadensis</i>
Herbaceous	(1) <i>Achnatherum speciosum</i>

Physiographic features

The Stony Terrace 4-8 P.Z. site occurs on lake terraces associated with Lake Lahontan and other Pleistocene lakes. Slopes range from 4 to 15 percent. Elevations are 4100 to 4400 feet.

Table 2. Representative physiographic features

Landforms	(1) Lake terrace
Runoff class	Negligible to high
Elevation	1,250 – 1,340 m
Slope	0 – 20 %
Water table depth	180 cm
Aspect	Aspect is not a significant factor

Climatic features

The climate is arid with cool, moist winters and hot, dry summers. Average annual precipitation is 4 to 6 (8) inches. Mean annual air temperature is 52 to 54 degrees F. The average growing season is about 120 to 140 days.

Table 3 Representative climatic features

Frost-free period (average)	140 days
Freeze-free period (average)	
Precipitation total (average)	200 mm

Influencing water features

There are no influencing water features associated with this site.

Soil features

The soils associated with this site are very shallow and well drained. The soils are formed in lacustrine deposits derived from mixed rocks and tufa deposits. The soil surface is extremely cobbly. Available water capacity is very low. The soils are moist for short periods in winter and early spring and dry in late spring through early fall. The moisture regime is typic aridic and the temperature regime is mesic. Runoff is high and permeability is rapid in the upper part of the profile and very slow in the lower part.

Soils correlated to this ecological site include Jacaranda and Inmo.

Table 4. Representative soil features

Parent material	(1) Alluvium – granite (2) Alluvium – tufa (3) Alluvium
Surface texture	(1) Extremely cobbly loamy sand
Family particle size	(1) Sandy
Drainage class	Well drained
Permeability class	Rapid
Soil depth	10 – 30 cm
Surface fragment cover <=3"	30 – 40 %
Surface fragment cover >3"	50 – 60 %
Available water capacity (0-101.6cm)	0.25 – 0.51 cm

Calcium carbonate equivalent (0-101.6cm)	0 – 10 %
Electrical conductivity (0-101.6cm)	0 – 10 mmhos/cm
Sodium adsorption ratio (0-101.6cm)	0 – 10
Soil reaction (1:1 water) (0-101.6cm)	8.4 – 10
Subsurface fragment volume <=3" (Depth not specified)	30 – 40 %
Subsurface fragment volume >3" (Depth not specified)	30 – 40 %

Ecological dynamics

Nevada ephedra is drought tolerant and requires approximately 5 inches of annual precipitation. Nevada ephedra occurs in both recently disturbed (6-12 years post-disturbance) and undisturbed desert communities. It reproduces both vegetatively and by seed.

Nevada ephedra leafs out in early to late spring and in September after summer rains. It forms buds in early spring, and cones open from March through May, though lack of available soil moisture may inhibit cone production. Seed matures in early summer. Nevada ephedra is physiologically inactive during hot summer months.

Desert needlegrass is a stress-tolerant ruderal and reproduces both vegetatively and by seed. Indian ricegrass typically reproduces by seed. In disturbed areas, desert needlegrass and Indian ricegrass seedlings may be the first perennials to appear.

These deep-rooted native perennial grasses and shrubs optimize infiltration and runoff.

Fire Ecology: Most plant communities in which Nevada ephedra commonly occurs historically experienced stand-replacement fire regimes. Desert shrub types and desert grassland communities had fire intervals of 35 to

State and transition model

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			83-112	
	desert needlegrass	ACSP12	<i>Achnatherum speciosum</i>	78-101	–
	Indian ricegrass	ACHY	<i>Achnatherum hymenoides</i>	4-11	–

2	Secondary Perennial Grasses			1-11	
	squirreltail	ELEL5	<i>Elymus elymoides</i>	1-4	—
	needle and thread	HECO26	<i>Hesperostipa comata</i>	1-4	—
	Sandberg bluegrass	POSE	<i>Poa secunda</i>	1-4	—
Forb					
3	Perennial			4-18	
	globemallow	SPHAE	<i>Sphaeralcea</i>	1-4	—
4	Annual			1-22	
Shrub/Vine					
5	Primary Shrubs			67-90	
	Nevada jointfir	EPNE	<i>Ephedra nevadensis</i>	67-90	—
6	Secondary Shrubs			11-34	
	rabbitbrush	CHRY9	<i>Chrysothamnus</i>	2-7	—
	spiny hopsage	GRSP	<i>Grayia spinosa</i>	2-7	—
	burrobrush	HYSA	<i>Hymenoclea salsola</i>	2-7	—
	desert pepperweed	LEFR2	<i>Lepidium fremontii</i>	2-7	—
	Nevada dalea	PSPO	<i>Psoralea polydenia</i>	1-7	—
	littleleaf horsebrush	TEGL	<i>Tetradymia glabrata</i>	2-7	—

Animal community

Livestock Interpretations: This site is suitable for livestock grazing. Nevada ephedra is important winter browse for domestic cattle, sheep and goats. Desert needlegrass produces considerable basal foliage and is good forage while young. Young desert needlegrass is palatable to all classes of livestock. Mature herbage is moderately grazed by horses and cattle but rarely grazed by sheep. Indian ricegrass is highly palatable to all classes of livestock in both green and cured condition. It supplies a source of green feed before most other native grasses have produced much new growth. 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: Mule deer, bighorn sheep, and pronghorn browse Nevada ephedra, especially in spring and late summer when new growth is available. The seeds are a valuable food source for small mammals, small nongame birds and upland game birds. Nevada ephedra also provides good cover for small mammals; fair cover for pronghorn, small nongame birds, and upland game birds; and poor cover for game animals and waterfowl.

Hydrological functions

Runoff is high. Permeability is rapid in the upper part of the profile and very slow in the lower part.

Other products

Native Americans used Nevada ephedra as a tea to treat stomach and kidney ailments. Indian ricegrass was traditionally eaten by some Native Americans. The Paiutes used seed as a reserve food source.

Other information

Nevada ephedra is useful for erosion control, and seedlings have been successfully planted onto reclaimed strip mines. Atrazine may be effective in controlling Nevada ephedra, though some plants can survive through crown sprouting. Irrigation may increase control by atrazine. Desert needlegrass seeds are easily germinated and have potential for commercial use. Desert needlegrass may be used for groundcover in areas of light disturbance, but it is susceptible to excessive trampling.

Inventory data references

NASIS soil component data.

Type locality

Location 1: Mineral County, NV	
Township/Range/Section	T11N R29E S6
Latitude	38° 50'29"
Longitude	118° 46'41"
General legal description	Northwest of Walker Lake on the Walker River Indian Reservation, Mineral County, Nevada. This site also occurs in Pershing County, Nevada.

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

P Novak-Echenique

Approval

Kendra Moseley, 6/03/2024

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)	P.Novak-Echenique
Contact for lead author	State Rangeland Management Specialist
Date	01/20/2008
Approved by	
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 rare. Flow patterns short and stable.

3. Number and height of erosional pedestals or terracettes: Pedestals are rare with occurrence typically limited to areas within water flow patterns.

4. Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground): Bare Ground 10-15%

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 from grasses and annual & perennial forbs) expected to move distance of slope length during intense summer convection storms or rapid snowmelt events. Persistent litter (large woody material) will remain in place except during catastrophic 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 should be 1 to 3 on most soil textures found on this site. (To be field tested.)

9. Soil surface structure and SOM content (include type of structure and A-horizon color and thickness): Surface structure is typically single grain. Soil surface colors are light and soils are typified by an ochric epipedon. Organic carbon of the surface 2 to 3 inches is less than 1 percent.

10. Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff: Perennial grass and shrub canopies and associated litter break raindrop impact. Loamy sand surface textures have rapid permeability and high surface runoff.

11. Presence and thickness of compaction layer (usually none; describe soil profile features which may be mistaken for compaction on this site): Compacted layers are not present.

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: Desert shrubs (Nevada ephedra, spiny hopsage, Anderson wolfberry, etc.) >> deep-rooted, cool season, bunchgrasses

Sub-dominant: Rhizomatous shallow-rooted, perennial bunchgrasses = associated, tall-statured, shrubs > deep-rooted, perennial forbs = fibrous, shallow-rooted, perennial forbs = annual forbs.

Other:

Additional:

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

Dead branches within individual shrubs common and standing dead shrub canopy material may be as much as 35% of total woody canopy; mature bunchgrasses commonly ($\pm 25\%$) have dead centers.

14. **Average percent litter cover (%) and depth (in):** Between plant interspaces (<5%) and depth ($\pm \frac{1}{4}$ -inch)
-

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

For normal or average growing season (February thru April [May]) $\pm 200\text{lbs/ac}$; Spring moisture significantly affects total 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: Douglas rabbitbrush, horsebrush, and burrobrush are increasers on this site. Russian thistle, annual mustards, and cheatgrass are invaders on this site.
-

17. **Perennial plant reproductive capability:** All functional groups should reproduce in above average growing season years
-