

Ecological site R029XY165NV ERODED NORTH SLOPE 12-14 P.Z.

Last updated: 2/20/2025
Accessed: 05/11/2025

General information

Provisional. A provisional ecological site description has undergone quality control and quality assurance review. It contains a working state and transition model and enough information to identify the ecological site.

MLRA notes

Major Land Resource Area (MLRA): 029X–Southern Nevada Basin and Range

The Southern Nevada Basin and Range MLRA (29) represents the transition from the Mojave Desert to the Great Basin. It is cooler and wetter than the Mojave. It is warmer and typically receives more summer precipitation than the Great Basin. This area is in Nevada (73 percent), California (25 percent), and Utah (2 percent). It makes up about 26,295 square miles (68,140 square kilometers). Numerous national forests occur in the area, including the San Bernardino, Angeles, Sequoia, Inyo, Humboldt-Toiyabe, and Dixie National Forests. Portions of Death Valley National Monument, the Nuclear Regulatory Commission's Nevada Test Site, the Hawthorne Ammunition Depot, and the Nellis Air Force Range in Nevada and the China Lake Naval Weapons Center in California also are in this MLRA. The northeast part of the Paiute Indian Reservation and the southern third of the Walker River Indian Reservation are in the part of this MLRA in Nevada, and the Lone Pine, Fort Independence, and Big Pine Indian Reservations are in the part in California.

Physiography:

The entire area is in the Great Basin Section of the Basin and Range Province of the Intermontane Plateaus. The area of broad, nearly level, aggraded desert basins and valleys between a series of mountain ranges trending north to south. The basins are bordered by sloping fans and pluvial lake terraces. The mountains are uplifted fault blocks with steep side slopes and not well dissected due to limited annual precipitation. Most of the valleys in this MLRA are closed basins or bolsons containing sinks or playa lakes.

Geology:

The mountains are dominated by Pliocene and Miocene andesite and basalt rocks, Paleozoic and Precambrian carbonate rocks prominent in some areas. Scattered outcrops of older Tertiary intrusives and very young tuffaceous sediments (Pliocene and Miocene) are in the western and eastern thirds of this MLRA. The valleys consist mostly of alluvial fill and playa deposits at the lowest elevations in the closed basins.

Climate:

The average annual precipitation is 3 to 12 inches (75 to 305 millimeters) in most of this area. It may be as high as 29 inches (735 millimeters), on the higher mountain slopes. Most of the rainfall occurs as high-intensity, convective thunderstorms during the growing season. Summers are dry, but sporadic storms are common in July and August.

Water Resources:

Water resources are scarce. Ground water and surface water sources are limited. Streams are small and intermittent. Quality of surface water is naturally degraded as streams cross area of valley fill effected by dissolved salts. Irrigation water may raise the levels of dissolved salts and suspended sediments causing contamination.

Soils:

Dominant soil orders include Entisols and Aridisols.

Ecological site concept

The Eroded North Slope 12-14 P.Z. site is on eroded fan remnants on northerly exposures. Slopes range from 15 to 30 percent. Elevations are 5,000 to about 6,000 feet. Soils are shallow to moderately deep and well drained. Surface soils are medium textured and normally less than 6 to 10 inches thick to underlying material, commonly lacustrine or tuffaceous deposits. Because of steep slopes and sparse vegetation, the soils of this site are subject to

sheet and rill erosion.

Associated sites

R029XY172NV	NORTH SLOPE 12-14 This site occurs on mountain sideslopes on generally north and east exposures. Slopes range from 8 to 50 percent. Elevations are 4,500 to about 6,000 feet. The soils are shallow to bedrock and well drained. They are formed in residuum and colluvium derived from volcanic rock. The soil profile is modified with up to 80 percent cobbles and gravels. The soils have an argillic horizon with an abrupt textural boundary at a depth of about 8 inches.
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Similar sites

R029XY172NV	NORTH SLOPE 12-14 More productive site.
R029XY166NV	ERODED SOUTH SLOPE 12-14 P.Z. Less productive site; PUST, PLJA dominant species.

Table 1. Dominant plant species

Tree	Not specified
Shrub	(1) <i>Amelanchier utahensis</i> (2) <i>Purshia tridentata</i>
Herbaceous	(1) <i>Poa fendleriana</i>

Physiographic features

The Eroded North Slope 12-14 P.Z. site occurs on eroded fan remnants on northerly exposures. Slopes range from 15 to 30 percent. Elevations are 5,000 to about 6,000 feet.

Table 2. Representative physiographic features

Landforms	(1) Fan remnant
Runoff class	Medium to high
Elevation	4,920–6,070 ft
Slope	15–30%
Water table depth	72 in
Aspect	NW, N, NE

Climatic features

The climate associated with this site is semiarid with cool, moist winters and warm, dry summers. The mean annual precipitation is 8 to 12 inches, most falling as rain during the winter months. Additional moisture occurs from July through September in the form of intense, convective storms. Mean annual temperature is 45 to 53 degrees. The average growing season is 100 to 130 days. Climate stations are not available for this site.

Table 3. Representative climatic features

Frost-free period (average)	130 days
Freeze-free period (average)	
Precipitation total (average)	12 in

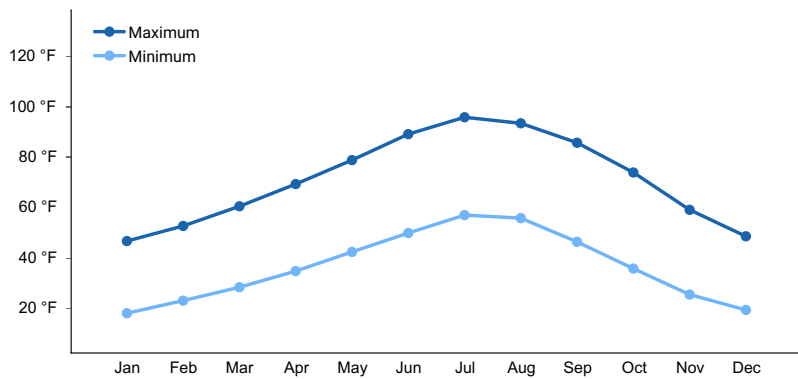


Figure 1. Monthly average minimum and maximum temperature

Influencing water features

There are no influencing water features associated with this site.

Soil features

Soils are shallow to moderately deep to duripan and well drained. Surface soils are medium textured and normally less than 6 to 10 inches thick to underlying material, commonly lacustrine or tuffaceous deposits. Because of steep slopes and sparse vegetation, the soils of this site are subject to sheet and rill erosion. The available water capacity is low. Runoff is very high. Soil series correlated to this site are Decan.

Table 4. Representative soil features

Parent material	(1) Alluvium–welded tuff (2) Lacustrine deposits
Surface texture	(1) Gravelly fine sandy loam
Drainage class	Well drained
Permeability class	Slow
Depth to restrictive layer	14–39 in
Surface fragment cover <=3"	25–45%
Surface fragment cover >3"	0–10%
Available water capacity (Depth not specified)	1–3.6 in
Calcium carbonate equivalent (Depth not specified)	1–10%
Electrical conductivity (Depth not specified)	0–2 mmhos/cm
Sodium adsorption ratio (Depth not specified)	0–1
Soil reaction (1:1 water) (Depth not specified)	7.4–9
Subsurface fragment volume <=3" (Depth not specified)	17–40%
Subsurface fragment volume >3" (Depth not specified)	0–10%

Ecological dynamics

Livestock use of this site is limited because of steep slopes. Plant community alterations to this site occur primarily by natural disturbances such as, drought, insects, erosion and fire. Soil erosion resulting from unstable soils on

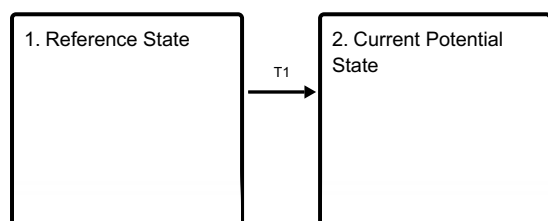
steep slopes impacts species composition and reduces productivity. Singleleaf pinyon and Utah juniper may increase in density on this site. A significant increase in tree density is hindered by surface soil instability and loss of the root zone due to erosion.

Fire Ecology:

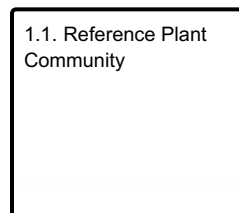
Fire return intervals of Utah serviceberry communities range from 2 to 25 years. Aboveground parts of Utah serviceberry may be killed or consumed under fire conditions with sufficient flame lengths. Utah serviceberry may be slightly harmed by fire, depending on moisture conditions, but is generally considered to be fire tolerant. Utah serviceberry sprouts from the root crown following fire. Adequate soil moisture is important to aid sprouting. Antelope bitterbrush is considered a weak sprouter and is often killed by summer or fall fire. Antelope bitterbrush in some areas may sprout after light-severity spring fire. High fuel consumptions increase antelope bitterbrush mortality and therefore favors seedling establishment. Fire effects on Stansbury cliffrose are variable. Fire may kill or severely damage plants. Late-season fire also increases the risk of mortality. Stansbury cliffrose is a weak sprouter that is generally killed by severe fire. Wyoming big sagebrush is killed by fire and establishes after fire from a seedbank; from seed produced by remnant plants that escaped fire; and from plants adjacent to the burn that seed in. Birchleaf mountain-mahogany is top-killed by fire. Fires typically reduce the number of Birchleaf mountain-mahogany shrubs, and as the fire frequency increases, the number of shrubs in a stand decreases. Birchleaf mountain-mahogany sprouts from the root crown and/or from rhizomes following fire. Seed is typically killed by fire, and it is rare to find seedlings in early postfire communities. Muttongrass is unharmed to slightly harmed by light-severity fall fire. Muttongrass appears to be harmed by and slow to recover from severe fire.

State and transition model

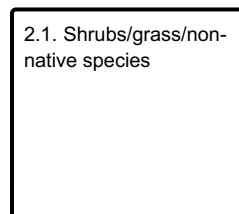
Ecosystem states



State 1 submodel, plant communities



State 2 submodel, plant communities



State 1 Reference State

The Reference State contains one community phase. The site is relatively stable because of the erodibility of the soil. It is susceptible to non-native plant establishment (State 2).

Community 1.1 Reference Plant Community

The reference plant community is dominated by Utah serviceberry, antelope bitterbrush, Stansbury cliffrose, and muttongrass. Potential vegetative composition is about 35 percent grasses, 10 percent forbs and 55 percent

shrubs. Approximate ground cover (basal and crown) is 35 to 45 percent.

Table 5. Annual production by plant type

Plant Type	Low (Lb/Acre)	Representative Value (Lb/Acre)	High (Lb/Acre)
Shrub/Vine	200	300	400
Grass/Grasslike	140	210	280
Forb	40	60	80
Tree	20	30	40
Total	400	600	800

State 2
Current Potential State

Similar to the Reference State, except the Current Potential State contains non-native plant species in the community.

Community 2.1
Shrubs/grass/non-native species

Community Phase 2.1 is dominated by Utah serviceberry, antelope bitterbrush, Stansbury cliffrose, and muttongrass. Non-native plant species are also present in the community. Potential vegetative composition is about 35 percent grasses, 10 percent forbs and 55 percent shrubs. Approximate ground cover (basal and crown) is 35 to 45 percent.

Transition T1
State 1 to 2

Establishment of non-native plant species.

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			120–150	
	muttongrass	POFE	<i>Poa fendleriana</i>	120–150	–
2	Secondary Perennial Grasses			18–60	
	Indian ricegrass	ACHY	<i>Achnatherum hymenoides</i>	3–18	–
	squirreltail	ELEL5	<i>Elymus elymoides</i>	3–18	–
	prairie Junegrass	KOMA	<i>Koeleria macrantha</i>	3–18	–
	rockcress	ARABI	<i>Arabidopsis</i>	2–12	–
	milkvetch	ASTRA	<i>Astragalus</i>	2–12	–
	matted buckwheat	ERCA8	<i>Eriogonum caespitosum</i>	2–12	–
	desert frasera	FRAL5	<i>Frasera albomarginata</i>	2–12	–
	beardtongue	PENST	<i>Penstemon</i>	2–12	–
	phlox	PHLOX	<i>Phlox</i>	6–12	–
	globemallow	SPHAE	<i>Sphaeralcea</i>	2–12	–
Forb					
3	Desert Annuals			20–60	

3	Perennial			30–60	
	rockcress	ARABI	<i>Arabidopsis</i>	3–12	—
	milkvetch	ASTRA	<i>Astragalus</i>	3–12	—
	Indian paintbrush	CAST12	<i>Castilleja</i>	3–12	—
	matted buckwheat	ERCA8	<i>Eriogonum caespitosum</i>	3–12	—
	desert frasera	FRAL5	<i>Frasera albomarginata</i>	3–12	—
	beardtongue	PENST	<i>Penstemon</i>	3–12	—
	phlox	PHLOX	<i>Phlox</i>	3–12	—
	globemallow	SPHAE	<i>Sphaeralcea</i>	3–12	—
4	Annual			1–12	
Shrub/Vine					
5	Primary Shrubs			204–330	
	Utah serviceberry	AMUT	<i>Amelanchier utahensis</i>	120–150	—
	Stansbury cliffrose	PUST	<i>Purshia stansburiana</i>	30–60	—
	antelope bitterbrush	PUTR2	<i>Purshia tridentata</i>	30–60	—
	birchleaf mountain mahogany	CEMOG	<i>Cercocarpus montanus</i> var. <i>glaber</i>	12–30	—
6	Secondary Shrubs			2–10	
	desert ceanothus	CEGR	<i>Ceanothus greggii</i>	6–12	—
	singleleaf ash	FRAN2	<i>Fraxinus anomala</i>	6–12	—
	hollywood	GUSA	<i>Guaiacum sanctum</i>	6–12	—
	beavertail pricklypear	OPBA2	<i>Opuntia basilaris</i>	6–12	—
	Gambel oak	QUGA	<i>Quercus gambelii</i>	6–12	—
	Sonoran scrub oak	QUTU2	<i>Quercus turbinella</i>	6–12	—
	yucca	YUCCA	<i>Yucca</i>	6–12	—
Tree					
7	Evergreen			6–24	
	Utah juniper	JUOS	<i>Juniperus osteosperma</i>	3–12	—
	singleleaf pinyon	PIMO	<i>Pinus monophylla</i>	3–12	—

Animal community

Livestock Interpretations:

This site has limited value for livestock grazing due to the steep slopes. Grazing management should be keyed to perennial grass production. Muttongrass is excellent forage for domestic livestock especially in the early spring. Muttongrass begins growth in late winter and early spring, which makes it available before many other forage plants. Utah serviceberry provides good browse for domestic sheep and domestic goats. In the spring, Utah serviceberry provides fair forage for cattle and good to excellent browse for domestic sheep and goats. Utah serviceberry provides good forage late in winter and in early spring, because it leafs out and blooms earlier than associated species. Antelope bitterbrush is important browse for livestock. Domestic livestock and mule deer may compete for antelope bitterbrush in late summer, fall, and/or winter. Cattle prefer antelope bitterbrush from mid-May through June and again in September and October. Stansbury cliffrose is an important browse species for livestock, especially in the winter. Livestock browse Wyoming big sagebrush, but may use it only lightly when palatable herbaceous species are available. Birchleaf mountain-mahogany is rated good to excellent forage for all classes of livestock. Forage is considered somewhat better for domestic sheep than cows. Utilization of true mountain-mahogany by both wildlife and livestock requires that habitats be managed to avoid over use.

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:

Utah serviceberry is a very important species for mule deer in the Great Basin. Porcupines and desert bighorn sheep also use Utah serviceberry. Utah serviceberry fruit is preferred by many birds. It can be an important winter food for birds since berries stay on the shrub throughout the winter. In Nevada, sage grouse eat the fruit of Utah serviceberry. Pronghorn antelope, mule deer, elk, and bighorn sheep utilize antelope bitterbrush extensively. Mule deer use of antelope bitterbrush peaks in September, when antelope bitterbrush may compose 91 percent of the diet. Winter use is greatest during periods of deep snow. Antelope bitterbrush seed is a large part of the diets of rodents, especially deer mice and kangaroo rats. Stansbury cliffrose is an important browse species for mule deer, pronghorn, game birds, and songbirds. Wild ungulates use it heavily in winter. Wyoming big sagebrush is preferred browse for wild ungulates. Pronghorn usually browse Wyoming big sagebrush heavily. 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. Birchleaf mountain-mahogany provides food and habitat for numerous wildlife. It is an important forage for mule deer. Forage value is rated as good for elk, fair to good for mule deer, poor for pronghorn, and fair for upland game birds, small nongame birds, and small mammals. Mule deer consume true mountain-mahogany and utilize true mountain-mahogany habitats year round throughout its range. Degree of use may depend on phenology, season, and/or weather. Utilization of Birchleaf mountain-mahogany by both wildlife and livestock requires that habitats be managed to avoid over use. Birchleaf mountain-mahogany may be consumed by both livestock and wildlife species any time these species occupy the same area. Birchleaf true mountain-mahogany is consumed primarily in the summer by bighorn sheep. Deer and elk make heavy use of muttongrass, especially in early spring when other green forage is scarce. Depending upon availability of other nutritious forage, deer may use mutton grass in all seasons. Mutton grass cures well and is an important fall and winter deer food in some areas.

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 has potential for upland and big game hunting.

Other products

Utah serviceberry fruits were used by Native Americans and early European explorers in North America for food and medicine. Triterpenoids extracted from Stansbury cliffrose have been shown to have inhibitory effects on HIV and Epstein-Barr virus. Native Americans used the inner bark for making clothing and ropes, and the branches for making arrows. Native Americans made tea from big sagebrush leaves. They used the tea as a tonic, an antiseptic, for treating colds, diarrhea, and sore eyes and as a rinse to ward off ticks. Big sagebrush seeds were eaten raw or made into meal. Native people utilized Birchleaf mountain-mahogany in the past. Birchleaf mountain-mahogany was also used medicinally.

Other information

Utah serviceberry has been used to revegetate big game winter range and for surface stabilization. It grows slowly from seed and therefore transplanting may be more successful than seeding for revegetation projects. Antelope bitterbrush has been used extensively in land reclamation. Antelope bitterbrush enhances succession by retaining soil and depositing organic material and in some habitats and with some ecotypes, by fixing nitrogen. Stansbury cliffrose is recommended for wildlife, roadside, construction, and mine spoils plantings; and for restoring pinyon-juniper woodland, mountain brushland, basin big sagebrush grassland, black sagebrush, and black greasewood communities. It can be established on disturbed seedbeds by broadcast seeding, drill seeding, or transplanting. Fall or winter seeding is recommended. Wyoming big sagebrush is used for stabilizing slopes and gullies and for restoring degraded wildlife habitat, rangelands, mine spoils and other disturbed sites. It is particularly recommended on dry upland sites where other shrubs are difficult to establish. More recently Birchleaf mountain-mahogany has been suggested as a landscape or garden plant in the northwestern and southwestern U.S. It is suggested for dry, well-drained sites and has been recommended for water-wise landscaping because of its drought and heat

tolerance.

Inventory data references

NASIS soil component data.

Type locality

Location 1: Lincoln County, NV	
Township/Range/Section	T5S R71E S18
UTM zone	N
UTM northing	4155857
UTM easting	756167
Latitude	37° 30' 50"
Longitude	114° 6' 5"
General legal description	Beaver Dam State Park, Lincoln Co., Nevada

Other references

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

United States Department of Agriculture, Natural Resources Conservation Service. 2022. Land resource regions and major land resource areas of the United States, the Caribbean, and the Pacific Basin. U.S. Department of Agriculture, Agriculture Handbook 296.

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

Contributors

CJA

Approval

Kendra Moseley, 2/20/2025

Rangeland health reference sheet

Interpreting Indicators of Rangeland Health is a qualitative assessment protocol used to determine ecosystem condition based on benchmark characteristics described in the Reference Sheet. A suite of 17 (or more) indicators are typically considered in an assessment. The ecological site(s) representative of an assessment location must be known prior to applying the protocol and must be verified based on soils and climate. Current plant community cannot be used to identify the ecological site.

Author(s)/participant(s)	
Contact for lead author	
Date	05/11/2025
Approved by	Kendra Moseley
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

Indicators

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

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

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

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

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

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

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

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

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

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

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

12. **Functional/Structural Groups (list in order of descending dominance by above-ground annual-production or live foliar cover using symbols: >>, >, = to indicate much greater than, greater than, and equal to):**

Dominant:

Sub-dominant:

Other:

Additional:

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

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

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

16. **Potential invasive (including noxious) species (native and non-native). List species which BOTH characterize degraded states and have the potential to become a dominant or co-dominant species on the ecological site if their future establishment and growth is not actively controlled by management interventions. Species that become dominant for only one to several years (e.g., short-term response to drought or wildfire) are not invasive plants. Note that unlike other indicators, we are describing what is NOT expected in the reference state for the ecological site:**

17. **Perennial plant reproductive capability:**
