

Ecological site R029XY172NV NORTH SLOPE 12-14

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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 North Slope 12-14 site is 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.

Associated sites

R029XY164NV	GRAVELLY CLAY SLOPE 12-14 P.Z. This site is on mountain sideslopes on all exposures. Slopes range from 2 to 50 percent. Elevations are 4,800 to about 7,400 feet. The soils are shallow to lithic contact and well drained. Soils are formed in residuum and colluvium derived from volcanic rocks. Soils have an argillic horizon with an abrupt textural boundary at a depth of 2 to 4 inches.
R029XY165NV	ERODED NORTH SLOPE 12-14 P.Z. This 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.

Table 1. Dominant plant species

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

Physiographic features

The North Slope 12-14 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.

Table 2. Representative physiographic features

Landforms	(1) Mountain
Runoff class	Very high
Elevation	1,372–1,829 m
Slope	8–30%
Water table depth	183 cm
Aspect	N, E

Climatic features

The climate associated with this site is arid, characterized by cool, moist winters and hot, dry summers. Average annual precipitation is 12 to 14 inches. Moisture from intermittent convection storms provides an important source of precipitation from July through September. Mean annual air temperature is 45 to 50 degrees F. The average growing season is about 90 to 100 days. No climate stations are available for this site.

Table 3. Representative climatic features

Frost-free period (average)	100 days
Freeze-free period (average)	
Precipitation total (average)	356 mm

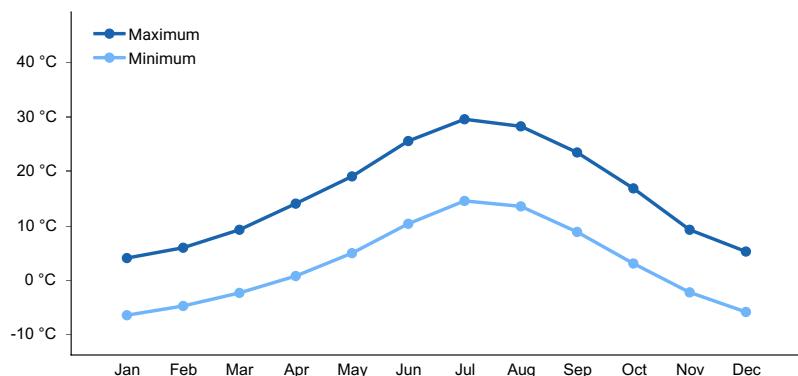


Figure 1. Monthly average minimum and maximum temperature

Influencing water features

There are no influencing water features associated with this site.

Soil features

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 20 centimeters. A mollic epipedon occurs from the soil surface to 30 centimeters. Soils are moderately permeable, and have a moderately high to high saturated hydraulic conductivity. Surface runoff potential is very high. Soil series associated with this ecological site include: Motoqua, loamy-skeletal, mixed, superactive, mesic Aridic Lithic Argiustolls.

Table 4. Representative soil features

Parent material	(1) Colluvium–volcanic rock (2) Residuum–volcanic rock
Surface texture	(1) Very gravelly sandy loam
Family particle size	(1) Loamy
Drainage class	Well drained
Permeability class	Slow to moderately slow
Soil depth	18–51 cm
Surface fragment cover <=3"	42–55%
Surface fragment cover >3"	0–6%
Available water capacity (0-101.6cm)	2.79–5.08 cm
Calcium carbonate equivalent (0-101.6cm)	0%
Electrical conductivity (0-101.6cm)	0 mmhos/cm
Sodium adsorption ratio (0-101.6cm)	0
Soil reaction (1:1 water) (0-101.6cm)	6.4–6.8
Subsurface fragment volume <=3" (Depth not specified)	9–48%
Subsurface fragment volume >3" (Depth not specified)	0%

Ecological dynamics

Ecological Dynamics:

The plant communities of this ecological site are dynamic in response to changes in disturbance regimes and weather patterns. The vegetative composition of this ecological site is referred to in the literature as interior chaparral. This plant community is best represented in the sub-Mogollan region of central Arizona, but disjunct stands can be found throughout southwest Utah and southern Nevada (Brooks et al., 2007). Species common to interior chaparral are adapted to fire prone systems, although methods of response vary. Some species sprout vigorously from the root crown other regenerate from seeds that accumulate in the soil and germinate prolifically following fire.

Singleleaf pinyon and Utah juniper readily increase on this site in the absence of natural disturbance regimes.

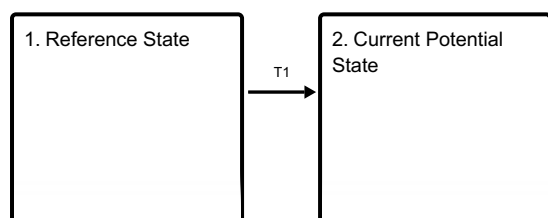
Fire Ecology:

Interior chaparral communities of this type have an estimated fire return interval of 50 to 100 years. Typically, at least 20 years of recovery is required before sites reburn (Brooks et al., 2007). Exclusion of fire leads to encroachment by forest species. The invasion of non-native annual grasses can narrow the fire return interval to a point in which even fire adapted chaparral species are unable to recover (Brooks et al., 2007).

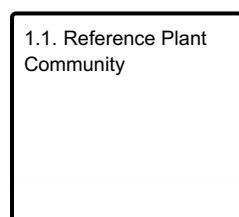
Turbinella oak is well adapted to survive fire and typically resprouts vigorously from the root crown and rhizomes in response to fire or other disturbance. Aboveground parts of Utah serviceberry may be killed or consumed under fire conditions with sufficient flame lengths. Utah serviceberry may be slightly harmed by fire, depending on moisture conditions, but is generally considered to be fire tolerant. Utah serviceberry sprouts from the root crown following fire. Soil moisture is important to aid sprouting. Mountain big sagebrush is highly susceptible to injury from fire. It is often top-killed by fire and will not resprout. Other minor understory species capable of sprouting from the rootcrown and rhizomes or reestablishing from soil stored seed following fire include: desert almond, desert ceanothus, pointleaf manzanita, Gambel's oak, desert bitterbrush and antelope bitterbrush. All of which may increase following wildfire. Muttongrass is unharmed to slightly harmed by light-severity fall fires. Muttongrass appears to be harmed by and slow to recover from severe fire.

State and transition model

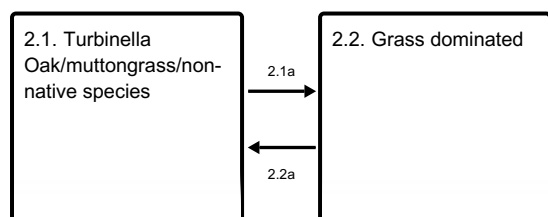
Ecosystem states



State 1 submodel, plant communities



State 2 submodel, plant communities



State 1 Reference State

The Reference State is representative of the natural range of variation of this ecological site under pristine

conditions. Plant community phase changes are driven by interactions between disturbance regimes and weather patterns.

Community 1.1

Reference Plant Community

The reference plant community is dominated by Turbinella oak, Utah serviceberry, and muttongrass. Potential vegetative composition is about 40 percent grasses, 10 percent forbs, and 50 percent shrubs and trees. Approximate ground cover (basal and crown) is 50 to 60 percent.

Table 5. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Shrub/Vine	457	633	809
Grass/Grasslike	314	432	549
Forb	90	123	157
Tree	36	45	54
Total	897	1233	1569

State 2

Current Potential State

The Current Potential State is similar to the Reference State with the exception of non-native plants in the community.

Community 2.1

Turbinella Oak/muttongrass/non-native species

Community 2.1 is dominated by Turbinella oak, Utah serviceberry, and muttongrass. Non-native plants are found in the community. Potential vegetative composition is about 40 percent grasses, 10 percent forbs, and 50 percent shrubs and trees. Approximate ground cover (basal and crown) is 50 to 60 percent.

Community 2.2 Grass dominated

Community 2.2 occurs after a fire that temporarily reduces shrubs and trees.

Pathway 2.1a

Community 2.1 to 2.2

A fire that reduces shrubs and trees.

Pathway 2.2a

Community 2.2 to 2.1

Time since fire. Turbinella oak readily re-sprouts after a fire and will again be the dominant shrub in the community.

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 (Kg/Hectare)	Foliar Cover (%)
Grass/Grasslike					
1	Primary Perennial Grasses			247–308	
	muttongrass	POFE	<i>Poa fendleriana</i>	247–308	–
2	Secondary Perennial Grasses			62–185	
	Indian ricegrass	ACHY	<i>Achnatherum hymenoides</i>	6–34	–
	purple threeawn	ARPU9	<i>Aristida purpurea</i>	6–34	–
	blue grama	BOGR2	<i>Bouteloua gracilis</i>	6–34	–
	squirreltail	ELELE	<i>Elymus elymoides</i> ssp. <i>elymoides</i>	6–34	–
	needle and thread	HECO26	<i>Hesperostipa comata</i>	6–34	–
	James' galleta	PLJA	<i>Pleuraphis jamesii</i>	6–34	–
3	Annual Grasses			6–34	
	sixweeks fescue	VUOC	<i>Vulpia octoflora</i>	1–34	–
Forb					
4	Perennial			62–123	
	milkvetch	ASTRA	<i>Astragalus</i>	6–22	–
	matted buckwheat	ERCA8	<i>Eriogonum caespitosum</i>	6–22	–
	fleabane	ERIGE2	<i>Erigeron</i>	6–22	–
	buckwheat	ERIOG	<i>Eriogonum</i>	6–22	–
	desert frasera	FRAL5	<i>Frasera albomarginata</i>	6–22	–
	lupine	LUPIN	<i>Lupinus</i>	6–22	–
	beardtongue	PENST	<i>Penstemon</i>	6–22	–
	phlox	PHLOX	<i>Phlox</i>	6–22	–
5	Annual			6–34	
Shrub/Vine					
6	Primary Shrubs			432–678	
	Sonoran scrub oak	QUTU2	<i>Quercus turbinella</i>	247–370	–
	Utah serviceberry	AMUT	<i>Amelanchier utahensis</i>	123–185	–
	mountain big sagebrush	ARTRV	<i>Artemisia tridentata</i> ssp. <i>vaseyana</i>	62–123	–
7	Secondary Shrubs			123–185	
	pointleaf manzanita	ARPU5	<i>Arctostaphylos pungens</i>	7–22	–
	Wyoming big sagebrush	ARTRW8	<i>Artemisia tridentata</i> ssp. <i>wyomingensis</i>	7–22	–
	desert ceanothus	CEGR	<i>Ceanothus greggii</i>	7–22	–
	mormon tea	EPVI	<i>Ephedra viridis</i>	7–22	–
	singleleaf ash	FRAN2	<i>Fraxinus anomala</i>	7–22	–
	broom snakeweed	GUSA2	<i>Gutierrezia sarothrae</i>	7–22	–
	pricklypear	OPUNT	<i>Opuntia</i>	1–22	–
	desert almond	PRFA	<i>Prunus fasciculata</i>	7–22	–
	desert bitterbrush	PUGL2	<i>Purshia glandulosa</i>	7–22	–
	Stansbury cliffrose	PUST	<i>Purshia stansburiana</i>	7–22	–
	antelope bitterbrush	PUTR2	<i>Purshia tridentata</i>	7–22	–
	Gambel oak	QUGA	<i>Quercus gambelii</i>	7–22	–

	skunkbush sumac	RHTR	<i>Rhus trilobata</i>	7–22	–
	banana yucca	YUBA	<i>Yucca baccata</i>	7–22	–
Tree					
8	Evergreen			11–45	
	Utah juniper	JUOS	<i>Juniperus osteosperma</i>	6–22	–
	singleleaf pinyon	PIMO	<i>Pinus monophylla</i>	6–22	–

Animal community

Livestock Interpretations:

This site has limited value for livestock grazing, due to steep slopes and lack of available water sources.

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. Turbinella oak is of great forage value during drought emergencies. When grass forage is available, turbinella oak is utilized lightly by livestock. 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. 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:

Interior chaparral communities are important for wildlife. Large game, such as deer, use these sites for foraging resources and cover. Turbinella oak is of great forage value during drought emergencies. When grass forage is available, turbinella oak is utilized lightly by wildlife. 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. Mountain big sagebrush is highly preferred and nutritious winter forage for mule deer and elk. 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 muttongrass in all seasons. Muttongrass 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 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

Utah serviceberry fruits were used by Native Americans and early European explorers in North America for food and medicine. 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

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.

Inventory data references

NASIS soil component data.

Type locality

Location 1: Lincoln County, NV	
Township/Range/Section	T5S R71E S21
UTM zone	N
UTM northing	759863
UTM easting	4153785
Latitude	37° 29' 40"
Longitude	114° 3' 38"
General legal description	Beaver Dam State Park, Lincoln County, Nevada.

Other references

Brooks, M.L., T.C. Esque and T. Duck. 2007. Creosotebush, blackbrush, and interior chaparral shrublands. Chapter 6. USDA Forest Service Gen. Tech. Rep. RMRS-GTR-202.

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

CJ ANDERSON

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	05/12/2025
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:**
