

Ecological site R030XB070NV VOLCANIC HILL 5-7 P.Z.

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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.

Ecological site concept

This site occurs on summits and sideslopes of rolling hills, mountains, and pediments. Slopes range from 4 to 75 percent, but slope gradients of 8 to 30 percent are most typical. Elevations are 2200 to 5900 feet. The soils associated with this site are typically shallow, well drained to somewhat excessively drained, and derived from volcanic parent material. This is a group concept and provisional STM that also covers R030XB071NV, R030XB146CA.

Associated sites

R030XB044NV	COBBLY CLAYPAN 5-7 P.Z.
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Similar sites

R030XB071NV	VOLCANIC SLOPE 7-9 P.Z. AMDU2 minor shrub; ERFAP-EPHED spp. codominant; occurs on steep, northerly, aspects
R030XB095NV	SHALLOW VOLCANIC HILL 5-7 P.Z. Less productive site; AMDU2 minor shrub
R030XB008NV	SHALLOW GRANITIC HILL 5-7 P.Z. Soils derived from granitic (schist or gneiss)

Table 1. Dominant plant species

Tree	Not specified
Shrub	(1) <i>Eriogonum fasciculatum</i> var. <i>polifolium</i> (2) <i>Ambrosia dumosa</i>
Herbaceous	(1) <i>Achnatherum speciosum</i> (2) <i>Pleuraphis rigida</i>

Physiographic features

This site occurs on summits and sideslopes of rolling hills, mountains, and pediments. Slopes range from 4 to 75 percent, but slope gradients of 8 to 30 percent are most typical. Elevations are 2200 to 5900 feet.

Table 2. Representative physiographic features

Landforms	(1) Hill (2) Mountain (3) Pediment
Elevation	670 – 1,800 m
Slope	0 – 80 %
Aspect	Aspect is not a significant factor

Climatic features

The climate is arid and is characterized with cool, moist winters and hot, dry summers. Average annual precipitation is 5 to 7 inches. Mean annual air temperature is 63 to 66 degrees F. The average growing season is about 200 to 280 days.

Table 3 Representative climatic features

Frost-free period (average)	280 days
Freeze-free period (average)	
Precipitation total (average)	180 mm

Influencing water features

There are no influencing water features associated with this site.

Soil features

The soils associated with this site are typically shallow, well drained to somewhat excessively drained, and derived from volcanic parent material. These soils have a surface cover of gravel-sized rock fragments in excess of 45 percent. Total surface cover of all rock fragments (gravels, cobbles, and stones) is greater than 60 percent. Available water capacity is very low and runoff is high to very high depending on slope. The soils series associated with this site include Haleburu and Nipton.

Table 4. Representative soil features

Surface texture	(1) Extremely gravelly sandy loam (2) Very cobbly sandy loam (3) Very stony sandy loam
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Family particle size	(1) Loamy
Drainage class	Well drained to somewhat excessively drained
Permeability class	Moderately rapid
Soil depth	10 – 100 cm
Surface fragment cover <=3"	40 – 70 %
Surface fragment cover >3"	20 – 30 %
Available water capacity (0-101.6cm)	0.76 – 5.84 cm
Calcium carbonate equivalent (0-101.6cm)	0 – 30 %
Electrical conductivity (0-101.6cm)	Not specified
Sodium adsorption ratio (0-101.6cm)	0 – 10
Soil reaction (1:1 water) (0-101.6cm)	7.4 – 10
Subsurface fragment volume <=3" (Depth not specified)	40 – 70 %
Subsurface fragment volume >3" (Depth not specified)	10 – 40 %

Ecological dynamics

As ecological condition deteriorates, creosotebush, white bursage, Mojave buckwheat and annual grasses and forbs increase as perennial grasses decline in the community. Snakeweed, burrobrush, Mojave buckwheat, and annual grasses and forbs greatly increase following major disturbance such as wildfire. Introduced annual grasses are invaders on this site.

Fire Ecology:

Fires in the Mojave Desert are infrequent and of low severity because production of annual and perennial herbs seldom provides a fuel load capable of sustaining fire. Fire generally kills white bursage. However, most white bursage plants burned because their canopies contained numerous small branches in proximity to herbaceous fuels. Mojave buckwheat is vulnerable to hot fires. Resprout success is low and most regeneration is from seeds. Frequent fires deplete the seed bank, making populations vulnerable to extinction. Fires in creosotebush scrub were an infrequent event in pre-settlement desert habitats, because fine fuels from winter annual plants were probably sparse, only occurring in large amounts during exceptionally wet winters. Fire kills many creosotebush. Creosotebush is poorly adapted to fire because of its limited sprouting ability. Creosotebush survives some fires that burn patchily or are of low severity. Nevada ephedra is top-killed by fire. Underground regenerative structures commonly survive when aboveground vegetation is consumed by fire. Nevada ephedra generally sprouts after fire damages aboveground vegetation and may increase in plant cover. Range ratany is top-killed by fire. Range ratany resprouts from the root crown after fire. Desert needlegrass has persistent dead leaf bases, which make it susceptible to burning. Fire removes the accumulation; a rapid, cool fire will not burn deep into the root crown and surviving tufts will resprout. Fire most likely top-kills big galleta. Big galleta sprouts from rhizomes following fire. Damage to big galleta from fire varies, depending on whether big galleta is dormant when burned. If big galleta is dry, damage may be severe. However, when plants are green, fire will tend to be less severe and damage may be minimal, with big galleta recovering quickly. Bush muhly regenerates following fire from soil-stored seed. Fire probably top-kills bush muhly. Burning causes at least short-term decline of bush muhly. Recovery time is thought to vary considerably and is probably dependent on postfire weather and competition.

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			10-91	
	desert needlegrass	ACSP12	<i>Achnatherum speciosum</i>	8-39	—
	big galleta	PLRI3	<i>Pleuraphis rigida</i>	1-31	—
	bush muhly	MUPO2	<i>Muhlenbergia porteri</i>	1-20	—
2	Secondary Perennial Grasses			8-20	
	threeawn	ARIST	<i>Aristida</i>	2-8	—
3	Annual			1-12	
Forb					
4	Perennial			8-20	
5	Annual			1-78	
Shrub/Vine					
6	Primary Shrubs			163-398	
	Eastern Mojave buckwheat	ERFAP	<i>Eriogonum fasciculatum</i> var. <i>polifolium</i>	78-157	—
	burrobush	AMDU2	<i>Ambrosia dumosa</i>	59-138	—
	creosote bush	LATR2	<i>Larrea tridentata</i>	8-31	—
	Parish's goldeneye	VIPA14	<i>Viguiera parishii</i>	1-31	—
	Nevada jointfir	EPNE	<i>Ephedra nevadensis</i>	8-20	—
7	Secondary Shrubs			39-78	
	desert pepperweed	LEFR2	<i>Lepidium fremontii</i>	4-12	—
	spiny menodora	MESP2	<i>Menodora spinescens</i>	4-12	—
	Fremont's dalea	PSFR	<i>Psorothamnus fremontii</i>	4-12	—
	Mojave woodyaster	XYTO2	<i>Xylorhiza tortifolia</i>	4-12	—
	Schott's yucca	YUSC	<i>Yucca ×schottii</i>	4-12	—
	sweetbush	BEJU	<i>Bebbia juncea</i>	4-12	—
	cottontop cactus	ECPO2	<i>Echinocactus polycephalus</i>	4-12	—
	brittlebush	ENFA	<i>Encelia farinosa</i>	4-12	—

	Virgin River brittlebush	ENVI	<i>Encelia virginensis</i>	4-12	–
	California barrel cactus	FECY	<i>Ferocactus cylindraceus</i>	2-4	–

Table 6. Community 2.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
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Table 7. Community 2.2 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
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Table 8. Community 2.3 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
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Table 9. Community 3.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
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Table 10. Community 3.2 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
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Table 11. Community 3.3 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
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Table 12. Community 4.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
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Animal community

Livestock Interpretations: This site has limited value for livestock grazing due to steep slopes and low forage production. Grazing management should be keyed to perennial grasses or palatable shrub production. 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. Big galleta is considered a valuable forage plant for cattle and domestic sheep. Its coarse, rigid culms make it relatively resistant to heavy grazing and trampling. Bush muhly is readily eaten by livestock throughout the year when available; however, it is usually not abundant enough to provide much forage. It is grazed heavily in winter when other species become scarce. Because of its branching habit, it is extremely susceptible to heavy grazing. Bush muhly is damaged when continuously grazed to a stubble height of less than 4 inches (10 cm). Mojave buckwheat has a browse rating of fair to poor for cattle. White bursage is of intermediate forage value. It is fair to good forage for horses and fair to poor for cattle and sheep. However, because there is often little other forage where white bursage grows, it is often highly valuable to browsing animals and is sensitive to browsing. Creosotebush is unpalatable to livestock. Consumption of creosotebush may be fatal to sheep. Nevada ephedra is important winter range browse for domestic cattle, sheep and goats. Nevada ephedra is usually grazed heavily and seems to be perfectly safe for grazing livestock since it induces neither toxicity in ewes or cows, nor congenital deformities in lambs. Range ratany is an important forage species for all classes of livestock. Palatability of range ratany is rated fair to good for cattle and sheep. Triangle goldeneye has limited browse value, when other forage is scarce, but otherwise are practically worthless as forage except that livestock will frequently pick off the flowering and fruiting heads, after frost, and nibble the leaves. 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: White bursage is an important browse species for wildlife. Creosotebush is unpalatable to most browsing wildlife. Mule deer, bighorn sheep, and pronghorn browse Nevada ephedra, especially in spring and late summer when new growth is available. Mountain quail eat Ephedra seeds. Range ratany is an important forage species for deer. Mule deer browse range ratany year-long with seasonal peaks. Mule deer peak use is from February to April and from August to October. Triangle goldeneye has limited browse value, when other forage is scarce, but otherwise are practically worthless as forage. Desert bighorn sheep and feral horses and burros will graze desert needlegrass. The palatability of bush muhly for wildlife species is rated fair to poor.

Hydrological functions

Rills are rare, but may be evident in areas recently subject to intense summer rainfall and on steeper slopes. Water flow patterns rare, but may be evident in areas recently subject to intense summer rainfall and on steeper slopes. Pedestals are rare with occurrence typically limited to areas within water flow patterns. There are no gullies. Sparse shrub canopy, surface rock, and associated litter break raindrop impact.

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

White bursage is a host for sandfood, a parasitic plant. Sandfood was a valuable food supply for Native Americans. Creosotebush has been highly valued for its medicinal properties by Native Americans. It has been used to treat at least 14 illnesses. Twigs and leaves may be boiled as tea, steamed, pounded into a powder, pressed into a poultice, or heated into an infusion. Some Native American tribes steeped the twigs and drank the tea as a general beverage. The Papago Indians used an infusion of the twigs externally for treating sore eyes and internally for dysentery. The roots provided them with a red dye for wool and other materials. The dye was also used as an ink.

Other information

Desert needlegrass may be used for groundcover in areas of light disturbance, but it is susceptible to excessive trampling. Big galleta's clumped growth form stabilizes blowing sand. White bursage may be used to revegetate disturbed sites in southwestern deserts. Creosotebush may be used to rehabilitate disturbed environments in southwestern deserts. Once established, creosotebush may improve sites for annuals that grow under its canopy by trapping fine soil, organic matter, and symbiont propagules. It may also increase water infiltration and storage.

Type locality

Location 1: Clark County, NV	
Township/Range/Section	T26S R64E S6
General legal description	Section 6, T26S. R64E. MDBM. About 3 miles southeast of Nelson, Eldorado Mountains, Clark County, Nevada. This site also occurs in Lincoln County.
Location 2: Clark County, NV	
Township/Range/Section	T26S R64E S10
General legal description	About ½ mile south of Nelson, rolling hills west of main road leading to microwave facility, Eldorado Mountains, Clark County, Nevada. This site also occurs in southern Lincoln counties.

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

GKB

Approval

Sarah Quistberg, 2/24/2025

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)	GK BRACKLEY
Contact for lead author	State Rangeland Management Specialist
Date	06/20/2006
Approved by	
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

Indicators

1. **Number and extent of rills:** Rills are rare, but may be evident in areas recently subject to intense summer rainfall and on steeper slopes.

2. **Presence of water flow patterns:** Water flow patterns rare, but may be evident in areas recently subject to intense summer rainfall and on steeper slopes.

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 to 30%; surface rock fragments >60%; shrub canopy to 10%; basal area for perennial herbaceous plants <1%.

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) is expected to move the 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 2 to 4 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 weak thin platy. Soil surface colors are light and soils are typified by an ochric epipedon. Organic matter of the surface 2 to 3 inches is less than to 1 percent.

10. Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff: Sparse shrub canopy, surface rock, and associated litter break raindrop impact. Medium to fine textured surface soils have moderate to slow infiltration and medium to rapid 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 none.

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: Mojave Desert shrubs >> deep-rooted, warm-season, grasses (big galleta & bush muhly) = deep-rooted, cool-season, grasses (desert needlegrass)(By above ground production)

Sub-dominant: Perennial forbs = annual forbs > shallow-rooted perennial grasses. (By above ground production)

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 are 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]) $\pm$ 350lbs/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: Invaders on this site include red brome, Mediterranean grass, and filaree.
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17. Perennial plant reproductive capability: All functional groups should reproduce in above average growing season years.
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