

Ecological site R030XB071NV VOLCANIC SLOPE 7-9 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 hills and mountain sideslopes on all aspects. At lower elevations, this site is restricted to more northerly exposures. Slopes range from 8 to 75 percent, but slope gradients of 30 to 50 percent are typical. Elevations are 1900 to 5700 feet. The soils associated with this site are shallow to very shallow and well to somewhat excessively drained. These soils have formed in residuum and colluvium from volcanic parent material. Please refer to group concept R030XB070NV to view the provisional STM.

Associated sites

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

R030XB008NV	SHALLOW GRANITIC HILL 5-7 P.Z. ACSP12 dominant grass; less productive site
R030XB070NV	VOLCANIC HILL 5-7 P.Z. ERFAP-AMDU2 codominant; less productive site
R030XB095NV	SHALLOW VOLCANIC HILL 5-7 P.Z. Less productive site

Table 1. Dominant plant species

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

Physiographic features

This site occurs on hills and mountain sideslopes on all aspects. At lower elevations, this site is restricted to more northerly exposures. Slopes range from 8 to 75 percent, but slope gradients of 30 to 50 percent are typical. Elevations are 1900 to 5700 feet.

Table 2. Representative physiographic features

Landforms	(1) Mountain (2) Hill
Elevation	580 – 1,740 m
Slope	10 – 80 %
Aspect	Aspect is not a significant factor

Climatic features

The climate of the Mojave Desert has extreme fluctuations of daily temperatures, strong seasonal winds, and clear skies. The climate is arid and is characterized with cool, moist winters and hot, dry summers. Most of the rainfall falls between November and April. Summer convection storms from July to September may contribute up to 25 percent of the annual precipitation. Average annual precipitation is 7 to 9 inches. Mean annual air temperature is 57 to 66 degrees F. The average growing season is about 180 to 300 days.

Table 3 Representative climatic features

Frost-free period (average)	300 days
Freeze-free period (average)	
Precipitation total (average)	230 mm

Influencing water features

There are no influencing water features associated with this site.

Soil features

The soils associated with this site are shallow to very shallow and well to somewhat excessively drained. These soils have formed in residuum and colluvium from volcanic parent material. The soils have a surface cover of gravel-sized rock fragments of 35 to 65 percent. Total surface cover of all rock fragments (gravels, cobbles, and stones) is greater than 60 percent. Water intake rates are moderately slow to moderately rapid, available water capacity is very low, and runoff is very high. Soil series associated with this site include Newera, Nipton, and Straycow.

Table 4. Representative soil features

Parent material	(1) Residuum – volcanic breccia
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Surface texture	(1) Very gravelly sandy loam (2) Extremely gravelly sandy loam (3) Extremely stony sandy loam
Family particle size	(1) Loamy
Drainage class	Well drained to somewhat excessively drained
Permeability class	Moderately slow to moderately rapid
Soil depth	10 – 40 cm
Surface fragment cover <=3"	40 – 70 %
Surface fragment cover >3"	10 – 30 %
Available water capacity (0-101.6cm)	0.76 – 2.03 cm
Calcium carbonate equivalent (0-101.6cm)	Not specified
Electrical conductivity (0-101.6cm)	Not specified
Sodium adsorption ratio (0-101.6cm)	0 – 10
Soil reaction (1:1 water) (0-101.6cm)	6.6 – 8.4
Subsurface fragment volume <=3" (Depth not specified)	40 – 70 %

Subsurface fragment volume >3" (Depth not specified)	0 – 40 %
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Ecological dynamics

Please refer to group concept R030XB070NV to view the provisional STM.

Galleta (*Pleuraphis jamseii*) and black grama occur only at the highest elevations of this ecological sites occurrence. Galleta is most prevalent following wildfire. Snakeweed, burrobrush, Mojave buckwheat, and annual grasses and forbs greatly increase following major disturbance such as wildfire. Non-native annual grasses are invaders on this site.

Fire Ecology:

Fires in the Mojave Desert were infrequent and of low severity because production of annual and perennial forbs seldom provides a fuel load capable of sustaining fire. It appears that wildfire was not historically a dominating influence in desert scrub landscapes. 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. 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. Green ephedra generally sprouts vigorously from the roots or woody root crown after fire and rapidly produces aboveground biomass from surviving meristematic tissue. It is capable of reestablishing disturbed areas through seed. Green ephedra has been found in plant communities with a wide range of fire return intervals, and has been found in ecosystems following large, stand replacing fires as well as small, patchy, erratic fires. Green ephedra establishes early after fire but with relatively low occurrence compared to mid- and late successional stages. Range ratany is top-killed by fire. Range ratany resprouts from the root crown after fire.

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			124-353	
	big galleta	PLRI3	<i>Pleuraphis rigida</i>	112-224	—
	desert needlegrass	ACSP12	<i>Achnatherum speciosum</i>	11-84	—
	bush muhly	MUPO2	<i>Muhlenbergia porteri</i>	1-45	—
2	Secondary Perennial Grasses			11-45	
	Indian ricegrass	ACHY	<i>Achnatherum hymenoides</i>	3-11	—
	threeawn	ARIST	<i>Aristida</i>	3-11	—
	black grama	BOER4	<i>Bouteloua eriopoda</i>	3-11	—
	low woollygrass	DAPU7	<i>Dasyochloa pulchella</i>	3-11	—
	James' galleta	PLJA	<i>Pleuraphis jamesii</i>	3-11	—
	slim tridens	TRMU	<i>Tridens muticus</i>	3-11	—
3	Annual Grasses			1-17	
Forb					
4	Perennial forbs			11-45	
	desert globemallow	SPAM2	<i>Sphaeralcea ambigua</i>	3-11	—
5	Annual forbs			1-45	
Shrub/Vine					
6	Primary shrubs			275-476	
	Eastern Mojave buckwheat	ERFAP	<i>Eriogonum fasciculatum</i> var. <i>polifolium</i>	168-224	—
	Death Valley jointfir	EPFU	<i>Ephedra funerea</i>	28-65	—
	Nevada jointfir	EPNE	<i>Ephedra nevadensis</i>	28-65	—

	mormon tea	EPVI	<i>Ephedra viridis</i>	28-65	–
	Parish's goldeneye	VIPA14	<i>Viguiera parishii</i>	11-28	–
7	Secondary shrubs			28-84	
	burrobush	AMDU2	<i>Ambrosia dumosa</i>	6-17	–
	sweetbush	BEJU	<i>Bebbia juncea</i>	6-17	–
	Virgin River brittlebush	ENVI	<i>Encelia virginensis</i>	6-17	–
	California barrel cactus	FECY	<i>Ferocactus cylindraceus</i>	6-17	–
	creosote bush	LATR2	<i>Larrea tridentata</i>	6-17	–
	desert pepperweed	LEFR2	<i>Lepidium fremontii</i>	6-17	–
	water jacket	LYAN	<i>Lycium andersonii</i>	6-17	–
	spiny menodora	MESP2	<i>Menodora spinescens</i>	6-17	–
	Mojave yucca	YUSC2	<i>Yucca schidigera</i>	6-17	–

Animal community

Livestock Interpretations: This site has limited value for livestock grazing, due to the low forage production and steep slopes. Grazing management should be keyed to dominant grasses or palatable shrub production. 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. 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. 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. 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. Green ephedra is an important browse species for big game and domestic livestock. It is heavily browsed by livestock and big game on winter range but only moderately or lightly browsed during other seasons. Green ephedra stems and twigs are nearly all within reach of grazing animals, and can serve as winter forage because they extend above the snow. 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: 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. Green ephedra is also of importance to small mammals; the stem parts and sizeable seeds are favored by many small mammals. 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

Runoff is very high. Permeability is moderately slow to moderately rapid.

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 hiking and has potential for upland and big game hunting.

Other products

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

Big galleta's clumped growth form stabilizes blowing sand. Desert needlegrass may be used for groundcover in areas of light disturbance, but it is susceptible to excessive trampling.

Type locality

Location 1: Clark County, NV	
Township/Range/Section	T25S R62E S18
General legal description	Section 18, T25S. R62E. MDBM. East side of McCullough Range, McCullough Pass area, Clark County, Nevada. This site also occurs in Lincoln 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

GKB

Approval

Kendra Moseley, 3/11/2025

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)	P Novak-Echenique
Contact for lead author	State Rangeland Management Specialist
Date	04/26/2010
Approved by	
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

Indicators

1. **Number and extent of rills:** Rills are none to rare, and may be evident in areas recently subject to intense summer rainfall and on steeper slopes

2. **Presence of water flow patterns:** Water flow patterns none to rare and may be evident in areas recently subject to intense summer rainfall and on steeper slopes. These are short (<1m) and not connected.

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 to 10-25% depending on amount of surface rock fragments

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 rainfall 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 3 to 6 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 to moderate fine subangular blocky. Soil surface colors are pale browns and are typified by an ochric epipedon. Organic matter of the surface 2 to 3 inches is <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 provide some protection from raindrop impact.

11. **Presence and thickness of compaction layer (usually none; describe soil profile features which may be mistaken for compaction on this site):** None. Subsoil horizons with massive structure or calcic horizons are not be mistaken for compaction.

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: Mojave Desert shrubs

Sub-dominant: deep-rooted, warm-season, grasses >> deep-rooted, cool-season, grasses > perennial forbs > annual forbs > annual grasses

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 25% of total woody canopy; mature bunchgrasses commonly ($\pm 25\%$) have dead centers.

14. **Average percent litter cover (%) and depth (in):** Between plant interspaces (20-30%) and depth ($< \frac{1}{4}$ -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 (March through May) ± 500 lbs/ac. Favorable years ± 700 lbs/ac and unfavorable years ± 300 lbs/ac.

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 on this site include red brome, annual mustards, Mediterranean grass, and red-stem filaree.
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17. **Perennial plant reproductive capability:** All functional groups should reproduce in average and above average growing season years. Little growth or reproduction occurs in extreme or extended drought periods.
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