USDA Natural Resources
Conservation Service

Ecological site R030XB095NV
SHALLOW VOLCANIC HILL 5-7 P.Z.

Last updated: 3/10/2025
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.

Ecological site concept

This site occurs on summits and sideslopes of rolling hills. Slopes gradients of 15 to 50 percent are typical. Elevations are 2000 to about 3500 feet. The soil associated with this site are shallow and have formed in residuum and colluvium from volcanic parent material.

Please refer to group concept R030XB072NV to view the provisional STM.

Associated sites

R030XB070NV	**VOLCANIC HILL 5-7 P.Z.**
R030XB071NV	**VOLCANIC SLOPE 7-9 P.Z.**

Similar sites

R030XB070NV	**VOLCANIC HILL 5-7 P.Z.** ERFAP-AMDU2 codominant
R030XB008NV	**SHALLOW GRANITIC HILL 5-7 P.Z.** Soils from granitic PM
R030XB071NV	**VOLCANIC SLOPE 7-9 P.Z.** more productive site

Table 1. Dominant plant species

Tree	Not specified
Shrub	(1) *Eriogonum fasciculatum*
Herbaceous	(1) *Achnatherum speciosum* (2) *Pleuraphis rigida*

Physiographic features

This site occurs on summits and sideslopes of rolling hills. Slopes gradients of 15 to 50 percent are typical. Elevations are 2000 to about 3500 feet.

Table 2. Representative physiographic features

Landforms	(1) Hill
Elevation	2,000–3,500 ft
Slope	15–50%

Climatic features

The climate is hot and arid, with mild winters and very hot summers. Precipitation is greatest in the winter with a lesser secondary peak in summer, typical of the Mojave Desert. 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)	7 in

Influencing water features

There are no influencing water features associated with this site.

Soil features

The soil associated with this site are shallow and have formed in residuum and colluvium from volcanic parent material. These soils have a surface cover of gravel-size rock fragments in excess of 45 percent. Total ground surface cover of rock fragments is typically greater than 60 percent. Available water capacity is low and runoff is medium to rapid.

Ecological dynamics

Please refer to group concept R030XB072NV to view the provisional STM.

As ecological condition deteriorates, perennial grasses and forbs decrease as shrub species become more dominant. Introduced annual forbs and grasses readily invade this site.

Fire Ecology:
Most 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. 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. 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. Following fire, Virgin River encelia depends on off-site seed rather than on-site sprouts for regeneration. Range ratany is top-killed by fire. Range ratany resprouts from the root crown after fire. 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. 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.

State and transition model

Ecosystem states

1. Reference Plant Community

State 1 submodel, plant communities

1.1. Reference Plant Community

State 1
Reference Plant Community

Community 1.1
Reference Plant Community

The reference plant community is dominated by Mojave buckwheat. Potential vegetative composition is about 15% grasses, 10% annual and perennial forbs and 75% shrubs. Approximate ground cover (basal and crown) is less than 10 percent.

Table 4. Annual production by plant type

Plant Type	Low (Lb/Acre)	Representative Value (Lb/Acre)	High (Lb/Acre)
Shrub/Vine	75	169	263
Grass/Grasslike	15	34	52
Forb	10	22	35
Total	**100**	**225**	**350**

Additional community tables

Table 5. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Lb/Acre)	Foliar Cover (%)
Grass/Grasslike					
1	**Primary Perennial Grasses**			10–36	
	desert needlegrass	ACSP12	*Achnatherum speciosum*	5–18	–
	big galleta	PLRI3	*Pleuraphis rigida*	5–18	–
2	**Secondary Perennial Grasses**			9–11	
	Indian ricegrass	ACHY	*Achnatherum hymenoides*	1–7	–
	threeawn	ARIST	*Aristida*	1–7	–
	low woollygrass	DAPU7	*Dasyochloa pulchella*	1–7	–
	bush muhly	MUPO2	*Muhlenbergia porteri*	1–7	–
3	**Annual Grasses**			1–11	
Forb					
4	**Primary Perennial forbs**			2–11	
	desert globemallow	SPAM2	*Sphaeralcea ambigua*	2–11	–
5	**Perennial forbs**			5–11	
6	**Annual forbs**			1–23	
Shrub/Vine					
7	**Primary shrubs**			127–216	
	Eastern Mojave buckwheat	ERFAP	*Eriogonum fasciculatum var. polifolium*	100–135	–
	creosote bush	LATR2	*Larrea tridentata*	11–23	–
	Virgin River brittlebush	ENVI	*Encelia virginensis*	5–18	–
	Nevada jointfir	EPNE	*Ephedra nevadensis*	5–11	–
	Parish's goldeneye	VIPA14	*Viguiera parishii*	1–11	–
8	**Secondary shrubs**			23–45	
	catclaw acacia	ACGR	*Acacia greggii*	2–11	–
	burrobush	AMDU2	*Ambrosia dumosa*	2–11	–
	brittlebush	ENFA	*Encelia farinosa*	2–11	–
	spiny menodora	MESP2	*Menodora spinescens*	2–11	–
	Fremont's dalea	PSFR	*Psorothamnus fremontii*	2–11	–
	Mojave yucca	YUSC2	*Yucca schidigera*	2–11	–

Animal community

Livestock Interpretations:
This site has limited value for livestock grazing, due to the low forage production, steep slopes and stony surfaces. 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. Mojave buckwheat has a browse rating of fair to poor for cattle. Creosotebush is unpalatable to livestock. Consumption of creosotebush may be fatal to sheep. Encelia has no forage value for domestic livestock. 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. 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. 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:
Creosotebush is unpalatable to most browsing wildlife. Virgin River encelia is important to the desert tortoise as a source of succulent forage in periods of low moisture. Encelia is a browse species of desert mule deer and desert bighorn Sheep. 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. 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. 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.

Hydrological functions

Available water capacity is low and runoff is medium to rapid.

Other products

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. The Papago Indians used an infusion of range ratany 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. Some Native American tribes steeped the twigs of Nevada ephedra and drank the tea as a general beverage.

Other information

Desert needlegrass may be used for groundcover in areas of light disturbance, but it is susceptible to excessive trampling. 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.

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, 3/10/2025

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	Sarah Quistberg
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:

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

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

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

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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:**

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17. **Perennial plant reproductive capability:**
