

Ecological site R030XB077NV

STEEP SOUTH SLOPE

Last updated: 2/26/2025
Accessed: 08/30/2026

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 steep, southerly exposures of hills and low mountains. Slopes range from 15 to over 75 percent, but slope gradients of 50 to 75 percent are most typical. Elevations are 500 to about 3500 feet. The soil associated with this site are shallow to very shallow, calcareous, and well drained to somewhat excessively drained. This site is part of group concept R030XB164CA.

Table 1. Dominant plant species

Tree	Not specified
Shrub	(1) <i>Encelia farinosa</i>
Herbaceous	Not specified

Physiographic features

This site occurs on steep, southerly exposures of hills and low mountains. Slopes range from 15 to over 75 percent, but slope gradients of 50 to 75 percent are most typical. Elevations are 500 to about 3500 feet.

Table 2. Representative physiographic features

Landforms	(1) Hill (2) Mountain
Elevation	150 – 1,070 m
Slope	20 – 80 %
Aspect	S

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 3 to 7 inches. Mean annual air temperature is 60 to 70 degrees F. The average growing season is about 180 to 290 days.

Table 3 Representative climatic features

Frost-free period (average)	290 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 soil associated with this site are shallow to very shallow, calcareous, and well drained to somewhat excessively drained. The soils are formed in colluvium and/or residuum from either granite, limestone, or volcanic rock. These soils have very high amounts of cobbles and stones at the surface (greater than 60 percent ground cover) that can reduce evaporation rates and have a stabilizing affect on soil erosion. Available water capacity is very low. Water intake rates are moderately rapid to moderate. Runoff is very high. The soil temperature regime is typically hyperthermic. Soil series associated with this site includes Goldroad, Haleburu, Iceberg, Redneedle, and Sunrock.

Table 4. Representative soil features

Parent material	(1) Colluvium – granite (2) Residuum – limestone
Surface texture	(1) Extremely stony sandy loam (2) Very gravelly sandy loam (3) Extremely stony fine sandy loam
Family particle size	(1) Loamy
Drainage class	Well drained to somewhat excessively drained
Permeability class	Moderate to moderately rapid
Soil depth	10 – 50 cm
Surface fragment cover <=3"	20 – 70 %
Surface fragment cover >3"	10 – 50 %

Available water capacity (0-101.6cm)	0.51 – 4.06 cm
Calcium carbonate equivalent (0-101.6cm)	0 – 50 %
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 – 8.4
Subsurface fragment volume <=3" (Depth not specified)	20 – 70 %
Subsurface fragment volume >3" (Depth not specified)	0 – 50 %

Ecological dynamics

The plant community is dominated by brittlebush. Brittlebush prefers steep slopes with a southern exposure. Brittlebush is drought tolerant and provides important soil stabilization on steep sites. Alleopathic properties make it an extremely successful competitor with winter annuals (Tesky 1993). California buckwheat thrives on rocky shallow soils. This site provides important habitat and feed for numerous wildlife species, including butterflies, lizards, and bighorn sheep (Montalov 2010).

Brittlebush is valuable for rehabilitating critical stabilization areas and disturbed sites, and is easily transplanted and can also be established from direct seeding. Creosotebush is poorly adapted to fire and experiences almost no recruitment under natural conditions. The life strategy of short-lived perennials like brittlebush may be better adapted to the current climatic conditions and disturbance regimes. In a long term plant succession study at a site fully protected from human impacts, the abundance of creosotebush obviously declined, while brittlebush experienced high recruitment and noticeable establishment within the stand (Turner 1990). Such changes in species composition can be attributed to the natural successional processes of this desert ecosystem.

Introduced annual forbs and grasses readily invade this site. Desert globemallow, plantain, red brome and other introduced annual grasses and forbs often dominate this site following wildfire.

The low fuel loads limits the ability of fire to spread on these sites. Yearly variation in fuel conditions can be contributed to production of annual species, native and nonnative. In years with high production of annual species, the risk of fire is greater to perennial shrubs, due to the continuous fuel load. The native species of this ecological site are well adapted to disturbance, easily establish from seed and will persist throughout the successional process on this ecological site.

Fire generally kills white bursage. However, most white bursage plants burned because their canopies contained numerous small branches in proximity to herbaceous fuels. White brittlebush is often top-killed or completely killed by fire. Following a fast-moving, low-severity fire, white brittlebush plants are mostly scorched. Only leaves and branches near the ground burn, leaving foliage on stems. White brittlebush is a good initial offsite colonizer of postfire communities via wind dispersed seed; it also has some ability to sprout from the root crown, which may be limited by intolerance of heat. Creosotebush is poorly adapted to fire because of its limited sprouting ability.

Creosotebush survives some fires that burn patchily or are of low severity. Range ratany is top-killed by fire but will resprout from the root crown.

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	Perennial Grasses			6-28	
	Indian ricegrass	ACHY	<i>Achnatherum hymenoides</i>	1-9	–
	desert needlegrass	ACSP12	<i>Achnatherum speciosum</i>	1-9	–
	threeawn	ARIST	<i>Aristida</i>	1-9	–
	big galleta	PLRI3	<i>Pleuraphis rigida</i>	1-9	–
2	Annual Grasses			1-13	
Forb					
3	Primary Perennial forbs			6-22	
	desert globemallow	SPAM2	<i>Sphaeralcea ambigua</i>	6-22	–
4	Secondary Perennial forbs			3-13	
5	Annual forbs			1-28	
	desert trumpet	ERIN4	<i>Eriogonum inflatum</i>	1-6	–
	plantain	PLANT	<i>Plantago</i>	1-6	–
Shrub/Vine					
6	Primary shrubs			204-279	
	brittlebush	ENFA	<i>Encelia farinosa</i>	196-224	–
	creosote bush	LATR2	<i>Larrea tridentata</i>	6-28	–
	burrobush	AMDU2	<i>Ambrosia dumosa</i>	1-13	–
7	Secondary shrubs			6-28	
	catclaw acacia	ACGR	<i>Acacia greggii</i>	3-9	–
	hedgehog cactus	ECHIN3	<i>Echinocereus</i>	3-9	–
	Virgin River brittlebush	ENVI	<i>Encelia virginensis</i>	3-9	–
	jointfir	EPHED	<i>Ephedra</i>	3-9	–
	Eastern Mojave buckwheat	ERFAP	<i>Eriogonum fasciculatum</i> var. <i>polifolium</i>	3-9	–
	California barrel cactus	FECY	<i>Ferocactus cylindraceus</i>	3-9	–
	beavertail pricklypear	OPBA2	<i>Opuntia basilaris</i>	3-9	–
	Parish's goldeneye	VIPA14	<i>Viguiera parishii</i>	3-9	–
	Mojave yucca	YUSC2	<i>Yucca schidigera</i>	3-9	–

Table 6. Community 2.1 plant community composition

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

Table 7. Community 2.2 plant community composition

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

Animal community

Livestock Interpretations: This site has limited value for livestock grazing, due to the low forage production, steep slopes, and stony surfaces. 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. White brittlebush has no forage value for domestic livestock. Creosotebush is unpalatable to livestock. Consumption of creosotebush may be fatal to sheep. 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. 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. White brittlebush is a browse species of desert mule deer and desert bighorn sheep. Creosotebush is unpalatable to most browsing wildlife. Range ratany is an important forage species for deer. Mule deer browse range ratany year-long with seasonal peaks.

Hydrological functions

Available water capacity is low. Water intake rates are moderately rapid. Runoff is medium to rapid depending on slope.

Recreational uses

Aesthetic value is derived from the colorful flowering of white brittlebush 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

White bursage is a host for sandfood, a parasitic plant. Sandfood was a valuable food supply for Native Americans. The stems of brittle bush exude a clear resin used by the Indians as glue and chewing gum. 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.

Other information

Creosotebush, white brittlebush and white bursage may be used to revegetate disturbed sites in southwestern deserts. Once established, these species may improve sites for annuals that grow under their canopy by trapping fine soil, organic matter, and symbiont propagules. Water infiltration and storage may also increase. Brittlebush is easily transplanted or can be established by direct seeding.

Type locality

Location 1: Clark County, NV	
Township/Range/Section	T25S R63E S4
General legal description	Approximately 2 miles south of the junction of US Highway 95 and Nevada Highway 165. Steep south-facing sideslopes of low hills to west of US Highway 95 on east side of Eldorado Valley, Clark County, Nevada.
Location 2: Clark County, NV	
Township/Range/Section	T23S R62E S16
General legal description	South-facing mountain backslopes on Black Mountain southeast of Henderson, Clark County, Nevada.

Other references

Brown, D.E. and R.A. Minnich. 1986. Fire and changes in creosotebush Scrub of the western Sonoran Desert, California. American Midland Naturalist. 116.2: 411-422.

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

Montalvo, A.M. 2010. Eriogonum fasciculatum Benth. Available: www.fs.fed.us [2010, May 28].

Turner, R.M. 1990. Long-Term Vegetation Change at a Fully Protected Sonoran Desert Site. Ecology. 71.2: 464-477

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

Contributors

GKB

Approval

Sarah Quistberg, 2/26/2025

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	07/19/2010
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. A few rills can be expected on steeper slopes in areas recently subjected to summer convection storms. Rock fragments armor the surface.

2. **Presence of water flow patterns:** Water flow patterns are none to rare but can be expected in areas recently subjected to summer convection storms, usually on steeper slopes.

3. Number and height of erosional pedestals or terracettes: Pedestals are none to rare. Occurrence is usually limited to areas of 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 15-25%; surface cover of rock fragments to 70%; shrub canopy to 5%; foliar cover of perennial herbaceous plants $\pm$ 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) 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 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 1 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 moderate thick platy to weak fine subangular blocky structure. Soil surface colors are light brown and soils are typified by an ochric epipedon. Organic matter of the surface horizon is typically <1 percent dropping off quickly below. Organic matter content can be more or less depending on micro-topography.

10. Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff: Shrub canopy and associated litter break raindrop impact.

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 not typical.

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, bunchgrasses > perennial forbs > annual forbs > deep-rooted, cool-season, bunchgrasses

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; some of the mature bunchgrasses (<10%) have dead centers.
-
14. Average percent litter cover (%) and depth (in): Between plant interspaces up to 5%.
-
15. Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):
For normal or average growing season $\pm$ 250 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: Invaders on this site include red-stem filaree, red brome, and Mediterranean grass.
-
17. Perennial plant reproductive capability: All functional groups should reproduce in average (or normal) and above average growing season years.
-