

Ecological site R030XB072NV STONY SLOPE 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.

MLRA notes

Major Land Resource Area (MLRA): 030X–Mojave Basin and Range

The Mojave Desert Major Land Resource Area (MLRA 30) is found in southern California, southern Nevada, the extreme southwest corner of Utah and northwestern Arizona within the Basin and Range Province of the Intermontane Plateaus. The Mojave Desert is a transitional area between hot deserts and cold deserts where close proximity of these desert types exert enough influence on each other to distinguish these desert types from the hot and cold deserts beyond the Mojave. Kottek et. al 2006 defines hot deserts as areas where mean annual air temperatures are above 64 F (18 C) and cold deserts as areas where mean annual air temperatures are below 64 F (18 C). Steep elevation gradients within the Mojave create islands of low elevation hot desert areas surrounded by islands of high elevation cold desert areas. The Mojave Desert receives less than 10 inches of mean annual precipitation. Mojave Desert low elevation areas are often hyper-arid while high elevation cold deserts are often semi-arid with the majority of the Mojave being an arid climate. Hyper-arid areas receive less than 4 inches of mean annual precipitation and semi-arid areas receive more than 8 inches of precipitation (Salem 1989). The western Mojave receives very little precipitation during the summer months while the eastern Mojave experiences some summer monsoonal activity. In summary, the Mojave is a land of extremes. Elevation gradients contribute to extremely hot and dry summers and cold moist winters where temperature highs and lows can fluctuate greatly between day and night, from day to day and from winter to summer. Precipitation falls more consistently at higher elevations while lower elevations can experience long intervals without any precipitation. Lower elevations also experience a low frequency of precipitation events so that the majority of annual precipitation may come in only a couple precipitation events during the whole year. Hot desert areas influence cold desert areas by increasing the extreme highs and shortening the length of below freezing events. Cold desert areas influence hot desert areas by increasing the extreme lows and increasing the length of below freezing events. Average precipitation and temperature values contribute little understanding to the extremes which govern wildland plant communities across the Mojave. Arid Eastern Mojave Land Resource Unit (XB)

LRU notes

The Mojave Desert is currently divided into 4 Land Resource Units (LRUs). This ecological site is within the Arid Eastern Mojave LRU where precipitation is bi-modal, occurring during the winter months and summer months. The Arid Eastern Mojave LRU is designated by the 'XB' symbol within the ecological site ID. This LRU is found across the eastern half of California, much of the mid-elevations of Nevada, the southernmost portions of western Utah, and the mid-elevations of northwestern Arizona. This LRU is essentially equivalent to the Eastern Mojave Basins and Eastern Mojave Low Ranges and Arid Footslopes of EPA Level IV Ecoregions Elevations range from 1650 to 4000 feet and precipitation is between 4 to 8 inches per year. This LRU is distinguished from the Arid Western Mojave (XA) by the summer precipitation, falling between July and September, which tends to support more warm season plant species. The 'XB' LRU is generally east of the Mojave River and the 117 W meridian (Hereford et. al 2004). Vegetation includes creosote bush, burrobush, Nevada jointfir, ratany, Mojave yucca, Joshua tree, cacti, big galleta grass and several other warm season grasses. At the upper portions of the LRU, plant production and diversity are greater and blackbrush is a common dominant shrub.

Ecological site concept

This ecological site is found on hill and mountain slopes above 3800 feet elevation. Soils are formed in colluvium and residuum from volcanic material where rock fragments larger than 10 inches diameter cover more than 20 percent of the soil surface. This is a group concept and provisional STM that also covers R030XA059NV, R030XB095NV

Associated sites

R030XB044NV	COBBLY CLAYPAN 5-7 P.Z.
R030XB071NV	VOLCANIC SLOPE 7-9 P.Z.

Similar sites

R030XC333AZ	Basalt Hills 10-13" p.z. Limy Conceptually the same ecological site.
R030XB095NV	SHALLOW VOLCANIC HILL 5-7 P.Z. Less productive site
R030XB073NV	VOLCANIC SLOPE 5-7 P.Z. ERFAP minor shrub; less productive site
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
R030XB071NV	VOLCANIC SLOPE 7-9 P.Z. AMDU2 minor shrub; more productive site

Table 1. Dominant plant species

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

Physiographic features

This site occurs on steep (often southerly-facing) hills and mountain sideslopes. Slopes range from 15 to 75 percent, but slope gradients of 30 to 50 percent are most typical. Elevations are 4000 to 5000 feet.

Table 2. Representative physiographic features

Landforms	(1) Mountain slope
Elevation	1,220 – 1,520 m
Slope	20 – 80 %

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 61 to 70 degrees F. The average growing season is about 200 to 340 days.

Table 3 Representative climatic features

Frost-free period (average)	340 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 and well drained. These soils have formed in residuum and colluvium from volcanic rock sources. Total surface cover of all rock fragments (gravels, cobbles, and stones) is greater than 60 percent. Water intake rates are moderate to moderately rapid, available water capacity is very low, and runoff is very high. Soil series associated with this site include Haleburu.

Table 4. Representative soil features

Parent material	(1) Colluvium – andesite
Surface texture	(1) Extremely gravelly sandy loam (2) Very stony sandy loam (3) Very gravelly sandy loam
Family particle size	(1) Loamy
Permeability class	Moderate to moderately rapid
Soil depth	10 – 40 cm

Surface fragment cover <=3"	30 – 70 %
Surface fragment cover >3"	0 – 10 %
Available water capacity (0-101.6cm)	1.27 – 2.03 cm
Calcium carbonate equivalent (0-101.6cm)	0 – 10 %
Electrical conductivity (0-101.6cm)	Not specified
Sodium adsorption ratio (0-101.6cm)	0 – 10
Soil reaction (1:1 water) (0-101.6cm)	7.9 – 10
Subsurface fragment volume <=3" (Depth not specified)	30 – 70 %
Subsurface fragment volume >3" (Depth not specified)	20 – 30 %

Ecological dynamics

As ecological condition deteriorates, creosotebush, Mojave buckwheat, and white bursage become more dominant. Species likely to invade this site are introduced annual grasses and forbs.

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. Mojave buckwheat is vulnerable to hot fires. Resprout success is low and most regeneration is from seeds. 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. White brittlebush is often top-killed or completely killed by fire. 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. Fire 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			11-37	
	big galleta	PLRI3	<i>Pleuraphis rigida</i>	6-22	—
	bush muhly	MUPO2	<i>Muhlenbergia porteri</i>	6-15	—
2	Secondary Perennial Grasses			6-22	
	Indian ricegrass	ACHY	<i>Achnatherum hymenoides</i>	1-6	—
	desert needlegrass	ACSP12	<i>Achnatherum speciosum</i>	1-6	—
	threeawn	ARIST	<i>Aristida</i>	1-6	—
	King's eyelashgrass	BLKI	<i>Blepharidachne kingii</i>	1-6	—
	slim tridens	TRMU	<i>Tridens muticus</i>	1-6	—
3	Annual Grasses			1-9	
Forb					
4	Perennial forbs			6-28	
5	Annual forbs			1-28	
Shrub/Vine					
6	Primary shrubs			175-317	
	burrobush	AMDU2	<i>Ambrosia dumosa</i>	84-112	—
	Eastern Mojave buckwheat	ERFAP	<i>Eriogonum fasciculatum</i> var. <i>polifolium</i>	43-84	—
	Parish's goldeneye	VIPA14	<i>Viguiera parishii</i>	28-56	—
	creosote bush	LATR2	<i>Larrea tridentata</i>	15-43	—
	brittlebush	ENFA	<i>Encelia farinosa</i>	6-22	—
7	Secondary shrubs			6-43	
	sweetbush	BEJU	<i>Bebbia juncea</i>	3-15	—
	cottontop cactus	ECPO2	<i>Echinocactus polycephalus</i>	3-15	—
	Virgin River brittlebush	ENVI	<i>Encelia virginensis</i>	3-15	—
	jointfir	EPHED	<i>Ephedra</i>	3-15	—
	California barrel cactus	FECY	<i>Ferocactus cylindraceus</i>	3-15	—
	Mojave yucca	YUSC2	<i>Yucca schidigera</i>	3-15	—

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 the low forage production, steep slopes and stony surfaces. Grazing management should be keyed to perennial 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. 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). 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. Mojave buckwheat has a browse rating of fair to poor for cattle. 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. Creosotebush is unpalatable to livestock. Consumption of creosotebush may be fatal to sheep. White brittlebush has no forage value for domestic livestock. White brittlebush infestation reduces forage production because it competes strongly with buffelgrass. High intensity livestock grazing can reduce white brittlebush growth, but causes no significant change after 3 years. 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. Triangle goldeneye has limited browse value, when other forage is scarce, but otherwise are practically worthless as forage. Creosotebush is unpalatable to most browsing wildlife. White brittlebush is a browse species of desert mule deer and desert bighorn sheep. White brittlebush infestation reduces forage production because it competes strongly with buffelgrass. The palatability of bush muhly for wildlife species is rated fair to poor.

Hydrological functions

Runoff is very high. Permeability is moderate 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

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. The stems of brittle bush exude a clear resin used by the Indians as glue and chewing gum.

Other information

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	T30S R65E S20
General legal description	South-facing sideslopes east from Spirit Mountain to Empire Wash in the Newberry 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/>).

Hereford, R., R.H. Webb and C. I. Longpre. 2004. Precipitation history of the Mojave Desert region, 1893-2001 (No. 117-03).

Kottek, M., Grieser, J., Beck, C., Rudolf, B., & Rubel, F. (2006). World map of the Köppen-Geiger climate classification updated. Meteorologische Zeitschrift, 15(3), 259-263.

Salem, B. B. (1989). Arid zone forestry: a guide for field technicians (No. 20). Food and Agriculture Organization (FAO).

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

Contributors

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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	04/27/2010
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. Rock fragments armor the surface.

2. Presence of water flow patterns: Water flow patterns are none to rare. Rock fragments armor the surface.

3. Number and height of erosional pedestals or terracettes: Pedestals are none to rare.

4. Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground): Bare Ground to 5-10%.

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 weak thin platy. Soil surface colors are light 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 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): 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: Mojave Desert shrubs

Sub-dominant: deep-rooted, warm-season, grasses > perennial forbs = annual forbs > deep-rooted, cool-season, grasses > 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 35% of total woody canopy; mature bunchgrasses commonly ($\pm 25\%$) have dead centers.
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- 14. Average percent litter cover (%) and depth (in):** Between plant interspaces ($< 5\%$) and depth ($\pm \frac{1}{4}$ -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 $\pm 250\text{lbs/ac}$.
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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, filaree, and Mediterranean grass.**
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- 17. Perennial plant reproductive capability:** All functional groups should reproduce in above average growing season years.
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