USDA Natural Resources
Conservation Service

Ecological site R030XA047CA
Shallow Granitic Slope 5-7" p.z.

Last updated: 2/18/2025
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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 Western Mojave Land Resource Unit (XA)

LRU notes

The Mojave Desert is currently divided into 4 Land Resource Units (LRUs). This ecological site is within the arid portions of the Mojave where precipitation primarily occurs during the winter months (Hereford et. al 2004). The lack of summer precipitation as well as cooler temperatures allows cool season species to occupy sites at lower elevations than they do in the Eastern Mojave. For example, sandberg bluegrass, winterfat and spiny hopsage are common at lower elevations in the Western Mojave than they are in the Eastern Mojave. Warm season species like big galleta rarely occur in the Western Mojave. The Arid Western Mojave LRU is designated by the 'XA' symbol within the ecological site ID and is roughly equivalent to Western Mojave Basins and Western Mojave Low Ranges and Arid Footslopes of EPA Level IV Ecoregions.

Elevations range from 1650 to 4300 feet and precipitation is between 4 to 8 inches per year. The Arid Western Mojave LRU is distinguished from the Arid Eastern Mojave (XB) by the lack of summer precipitation which excludes many warm season plant species from occurring in this LRU. Vegetation includes creosote bush, rabbitbrush, shadscale saltbush, spiny hopsage, winterfat, Nevada jointfir, and Joshua tree. At the upper elevations of the LRU, plant production and diversity are greater and blackbrush is a common dominant shrub. The Arid Western Mojave LRU generally lacks the diversity of yucca, cacti and warm season species found in the Arid Eastern Mojave.

Ecological site concept

The Shallow Sandstone Slopes ecological site is found within the hills and mountains landscapes below 3000 feet (915 m). Soils are shallow to densic material and formed in colluvium and residuum from sandstone. This concept is for the R030XA037CA ESD to avoid duplication in the event the 'F' and 'R' and state designations are dropped, the original ID would duplicate with R030XA047NV. Also the parent material for major soil components of R030XA047CA indicate the soils are formed in lacustrine deposits from granite. The geology layer suggests the material is colluvium and residuum from sandstone.

Table 1. Dominant plant species

Tree	Not specified
Shrub	(1) *Coleogyne ramosissima* (2) *Larrea tridentata*
Herbaceous	(1) *Achnatherum hymenoides*

Physiographic features

Table 2. Representative physiographic features

Landforms	(1) Lakebed (2) Fan remnant
Flooding frequency	None
Ponding frequency	None
Elevation	671–1,201 m
Slope	15–50%
Water table depth	152 cm
Aspect	Aspect is not a significant factor

Climatic features

Table 3. Representative climatic features

Frost-free period (average)	300 days
Freeze-free period (average)	315 days
Precipitation total (average)	178 mm

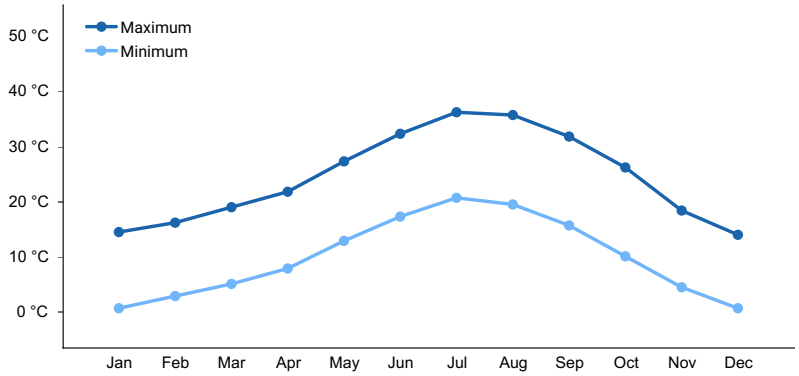

Figure 1. Monthly average minimum and maximum temperature

Influencing water features

Soil features

Table 4. Representative soil features

Surface texture	(1) Fine sandy loam
Family particle size	(1) Loamy
Drainage class	Well drained to somewhat excessively drained
Permeability class	Very slow to moderate
Soil depth	23–203 cm
Surface fragment cover <=3"	20–90%
Surface fragment cover >3"	0–7%
Available water capacity (0-101.6cm)	1.52–15.75 cm
Calcium carbonate equivalent (0-101.6cm)	0–1%
Electrical conductivity (0-101.6cm)	0–2 mmhos/cm
Sodium adsorption ratio (0-101.6cm)	0–5
Soil reaction (1:1 water) (0-101.6cm)	7.4–8.4
Subsurface fragment volume <=3" (Depth not specified)	1–35%
Subsurface fragment volume >3" (Depth not specified)	0%

Ecological dynamics

Please refer to group concept R030XA037CA to view the provisional STM.

State and transition model

Ecosystem states

1. Blackbrush - Creosote bush

State 1 submodel, plant communities

1.1. Blackbrush - Creosote bush

State 1
Blackbrush - Creosote bush

Community 1.1
Blackbrush - Creosote bush

Figure 2. Blackbrush-creosotebush

The interpretive plant community is the reference plant community prior to European colonization. This community is dominated by blackbrush (*Coleogyne ramosissima*) with a significant component of creosotebush (*Larrea tridentata*). Minor species include Mojave aster (*Xylorhiza tortifolia*), Mojave indigobush (*Psorothamnus arborescens*), Nevada ephedra (*Ephedra nevadensis*), and Sandberg bluegrass. The potential plant community is 95% shrubs, 1% perennial grasses, and 4% annual forbs.

Table 5. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Shrub/Vine	208	313	365
Forb	13	20	22
Grass/Grasslike	2	3	4
Total	**223**	**336**	**391**

Table 6. Ground cover

Tree foliar cover	0%
Shrub/vine/liana foliar cover	15-20%

Grass/grasslike foliar cover	1%
Forb foliar cover	2-3%
Non-vascular plants	0%
Biological crusts	0%
Litter	0%
Surface fragments >0.25" and <=3"	0%
Surface fragments >3"	0%
Bedrock	0%
Water	0%
Bare ground	0%

Table 7. Soil surface cover

Tree basal cover	0%
Shrub/vine/liana basal cover	5-7%
Grass/grasslike basal cover	0-1%
Forb basal cover	1-2%
Non-vascular plants	0%
Biological crusts	0%
Litter	3-5%
Surface fragments >0.25" and <=3"	15-20%
Surface fragments >3"	0%
Bedrock	0%
Water	0%
Bare ground	0%

Table 8. Canopy structure (% cover)

Height Above Ground (M)	Tree	Shrub/Vine	Grass/ Grasslike	Forb
<0.15	–	–	–	1-2%
>0.15 <= 0.3	–	–	1-1%	1-1%
>0.3 <= 0.6	–	2-3%	–	–
>0.6 <= 1.4	–	10-15%	–	–
>1.4 <= 4	–	3-5%	–	–
>4 <= 12	–	–	–	–
>12 <= 24	–	–	–	–
>24 <= 37	–	–	–	–
>37	–	–	–	–

Additional community tables

Table 9. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Kg/Hectare)	Foliar Cover (%)
Shrub/Vine					
1	**Perennial Shrubs**			208–365	
	blackbrush	CORA	*Coleogyne ramosissima*	157–275	–
	creosote bush	LATR2	*Larrea tridentata*	25–39	–
	burrobush	AMDU2	*Ambrosia dumosa*	11–20	–
	Mojave indigobush	PSAR4	*Psorothamnus arborescens*	4–10	–
	Mojave woodyaster	XYTO2	*Xylorhiza tortifolia*	4–10	–
	Joshua tree	YUBR	*Yucca brevifolia*	2–4	–
	Nevada jointfir	EPNE	*Ephedra nevadensis*	2–3	–
	burrobrush	HYSA	*Hymenoclea salsola*	2–3	–
Grass/Grasslike					
2	**Perennial Grass**			2–4	
	Indian ricegrass	ACHY	*Achnatherum hymenoides*	2–4	–
Forb					
3	**Annual Forbs**			11–18	
	pinyon blazingstar	MEER2	*Mentzelia eremophila*	4–8	–
	bristly fiddleneck	AMTE3	*Amsinckia tessellata*	2–3	–
	brittle spineflower	CHBR	*Chorizanthe brevicornu*	2–3	–
	pincushion flower	CHFR	*Chaenactis fremontii*	2–3	–
4	**Perennial Forb**			2–4	

Animal community

Desert tortoise (Gopherus agassizii) burrows have been observed in the vicinity of the site. Also creosotebush is a very important plant for animals that burrow in and around the roots.

Hydrological functions

The soils on this ecological site (Cutterbank) are very susceptible to erosion during heavy rainfall. Heavy rainfall will move sediment into drainageways from the site and form channels in the hillsides.

Recreational uses

This ecological site is located in an off-highway vehicle recreation area. Travel through this ecolgical site is currently limited to pre-existing roads.

Other information

This site is composed of highly erodible soils that may release a significant quantity of sediement into drainageways if disturbed. This may impact Red Rock Canyon State Park is located to the east of the type location. The park contains several rare plants that occur in drainageways, and an increased sediment load may adversely affect those rare plant populations.

Inventory data references

1 SCS Range 417 Production and Composition Record (2003)
2 Line-point intercept transects (2006)

Type locality

Location 1: Kern County, CA	
UTM zone	N
UTM northing	3914184
UTM easting	405558
Latitude	35° 21′ 59″
Longitude	118° 2′ 22″
General legal description	This site is located in the Jawbone-Butterbredt ACEC off the 2nd Los Angeles Aquaduct Rd., about 1/2 mile north of the junction with SC175.

Other references

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Contributors

Heath M. McAllister

Approval

Kendra Moseley, 2/18/2025

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	05/13/2025
Approved by	Kendra Moseley
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:

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11. **Presence and thickness of compaction layer (usually none; describe soil profile features which may be mistaken for compaction on this site):**

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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:**
