

Ecological site R030XB103NV

Warm Dry Wash

Last updated: 2/26/2025
Accessed: 04/17/2026

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.

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 Foothills 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, burrobrush, 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 site is an ephemeral stream, wash, drainageway or other similar landform within the upper fan piedmonts below 3600 feet (1100 m) elevation with headwaters also below 3600 feet. Stream size is small with a stream order between 1-2. This site is within Plant Hardiness Zone 9b or warmer where there are nearly 365 freeze free days or temperatures are rarely below 28 C. These areas are the warm desert islands within the Mojave rather than the cold desert environments of higher Mojave elevations. Additionally, these washes drain soils where a diagnostic subsurface horizon is common. Soils within these washes rarely have a diagnostic subsurface horizon except where headward erosion is occurring. This is a group concept and provisional STM that also covers the following ecological sites: R030XB131CA, R030XB132NV, R030XB133NV, R030XB149CA

Associated sites

R030XB005NV	<p>Arid Active Alluvial Fans</p> <p>This site is on the surrounding alluvial fans.</p>
R030XB019NV	<p>Eroded Fan Remnant Pavette 4-6 P.Z.</p> <p>This site is on the surrounding alluvial fans with a pavette microfeature. Slopes are generally less than 15% slope.</p>
R030XB099NV	<p>GRAVELLY RIDGE 5-7 P.Z.</p> <p>This site is on the side slopes of alluvial fans with over 80% large fragment (greater than 3/4 inch) surface cover. Slopes are generally greater than 15% slope.</p>
R030XB137CA	<p>Granitic Loam</p> <p>This site is on the fan skirts or fan aprons within the sheetflow zone of an ephemeral stream.</p>

Similar sites

R030XB028NV	<p>VALLEY WASH</p> <p>This site is a wash in higher elevations.</p>
R030XD010CA	<p>Frequently Flooded, Gravelly, Hyperthermic To Warm-Thermic Ephemeral Stream</p> <p>This site is a wash in lower elevations where washes are larger and closer to a water table.</p>

Table 1. Dominant plant species

Tree	(1) <i>Psorothamnus spinosus</i>
Shrub	(1) <i>Acacia greggii</i>
Herbaceous	Not specified

Physiographic features

This site occurs in drainage ways of inset fans and axial-stream terraces. Slope gradients of 2 to less than 8 percent are typical. Elevations are 500 to 3600 feet.

Table 2. Representative physiographic features

Landforms	<p>(1) Drainageway</p> <p>(2) Inset fan</p> <p>(3) Stream terrace</p>
-----------	---

Elevation	150 – 1,100 m
Slope	0 – 10 %
Aspect	Aspect is not a significant factor

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. This site is intermittently flooded. Average annual precipitation is 3 to 5 inches. Mean annual air temperature is 64 to 72 degrees F. The average growing season is about 280 to 360 days.

Table 3 Representative climatic features

Frost-free period (average)	360 days
Freeze-free period (average)	
Precipitation total (average)	130 mm

Influencing water features

There are no influencing water features associated with this site.

Soil features

The soil associated with this site are deep alluvium, well drained to excessively drained soils with rapid water intake rates. The soils are modified by high amounts of gravels, cobbles, or stones throughout the profile. These soils have a low available water capacity and runoff is slow.

Table 4. Representative soil features

Parent material	(1) Alluvium
Surface texture	(1) Sand
Family particle size	(1) Sandy-skeletal
Drainage class	Well drained to excessively drained

Ecological dynamics

Smoketree grows in gravelly or sandy washes within the warm desert islands of the Mojave Desert. Smoketree is restricted to the warm deserts because it can not survive extended periods with temperatures below freezing. Periodic, intense, flash floods are common.

Fire Ecology:

Catclaw is typically top-killed by fire. Following top-kill by fire, catclaw sprouts from the base. Postfire sprouting is considered prolific by some. White burrobrush establishes after fire via off-site seeds and sprouting. Because it seeds prolifically, white burrobrush can quickly

colonize burned sites.

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 (%)
Shrub/Vine					
5	Primary shrubs			232-360	
	smoketree	PSSP3	<i>Psoralea argophylla</i>	196-275	–
	catclaw acacia	SEGR4	<i>Senegalia greggii</i>	20-39	–
	burrobrush	HYSA	<i>Hymenoclea salsola</i>	8-26	–
	sweetbush	BEJU	<i>Bebbia juncea</i>	8-20	–
6	Secondary shrubs			17-34	
	burrobush	AMDU2	<i>Ambrosia dumosa</i>	4-20	–
	brittlebush	ENFA	<i>Encelia farinosa</i>	4-20	–
	white ratany	KRGR	<i>Krameria grayi</i>	4-20	–
	creosote bush	LATR2	<i>Larrea tridentata</i>	4-20	–
	Mojave sage	SAMO3	<i>Salvia mohavensis</i>	4-20	–
	Mojave yucca	YUSC2	<i>Yucca schidigera</i>	4-20	–
Forb					
4	Annual forbs			1-39	
	flatspine bur ragweed	AMAC2	<i>Ambrosia acanthicarpa</i>	1-2	–
	brittle spineflower	CHBR	<i>Chorizanthe brevicornu</i>	1-2	–
	pincushion flower	CHFR	<i>Chaenactis fremontii</i>	1-2	–
	common pussypaws	CIMO4	<i>Cistanthe monandra</i>	0-1	–
	Bigelow's tickseed	COBI	<i>Coreopsis bigelovii</i>	0-1	–
	flatcrown buckwheat	ERDE6	<i>Eriogonum deflexum</i>	0-1	–
	pygmy poppy	ESMI	<i>Eschscholzia minutiflora</i>	0-1	–
	chia	SACO6	<i>Salvia columbariae</i>	0-1	–
	Booth's evening primrose	CABO7	<i>Camissonia boothii</i>	0-1	–
3	Perennial forbs			8-26	
Grass/Grasslike					
1	Perennial grasses			8-39	
	desert needlegrass	ACSP12	<i>Achnatherum speciosum</i>	2-8	–
	threeawn	ARIST	<i>Aristida</i>	2-8	–
	low woollygrass	DAPU7	<i>Dasyochloa pulchella</i>	2-8	–
	big galleta	PLRI3	<i>Pleuraphis rigida</i>	2-8	–
2	Annual grasses			1-11	

Table 6. Community 1.2 plant community composition

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

Table 7. Community 2.1 plant community composition

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

Table 8. Community 2.2 plant community composition

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

Table 9. Community 3.1 plant community composition

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

Table 10. Community 3.2 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. Catclaw is typically grazed in the spring or when new growth is available, but animal densities and availability of other forage also affect livestock use of catclaw. Utilization of catclaw is typically restricted to spring when young twigs and leaves are available. Catclaw is able to withstand heavy grazing pressure. 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:** Catclaw acacia provides food, shelter, nesting sites, and nesting material to a host of wildlife species. Catclaw acacia browsers include deer and rabbits. Both game and nongame bird species feed on catclaw acacia.

Hydrological functions

Water intake rates are high, available water capacity is low, runoff is slow and the soils are excessively drained.

Other products

Native Americans used white burrobrush twigs and stems in several remedies. The twigs or leaves are mixed with all-thorn twigs, boiled, and the tea taken to treat skin rashes. The tea was used to relieve pain in the lungs and trachea, and to reduce swelling. Additionally, they use white burrobrush as a remedy for rheumatism.

Type locality

Location 1: Clark County, NV	
Township/Range/Section	T33S R65E S24
General legal description	Within active channels of inset fans that drain into Colorado River. Two miles west of Fort Mojave Indian Reservation, Clark County, Nevada.

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

BLS/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)	
Contact for lead author	
Date	04/17/2026
Approved by	
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:

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

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

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

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:

17. Perennial plant reproductive capability:
