

Ecological site R030XA038CA

Sandy Fan

Last updated: 3/10/2025
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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 Sandy Fan ecological site is found on stream terrace landforms between 3600 feet (1100 m) and 4300 feet (1300 m). The central concept of this ecological site within the Soil Survey of Benton-Owens Valley Area Parts of Inyo and Mono Counties, California (CA802) and is found on both major components of the 374 - Yellowrock-Seaman complex, 2 to 5 percent slopes map unit.

Associated sites

R029XG013CA	Sodic Terrace Sodic Terrace
R030XA002CA	Calcareous Fan 5-7 Calcareous Fan

Similar sites

R030XA008CA	Sandy Fan 5-7 Areas north of San Diego County where this range site was used are conceptually equivalent to the R030XA038CA ecological site. The R030XA008CA range site was copied to the R030XA038CA ESD in order to avoid duplicity with R030XA008NV in the event the 'F', 'R', and state endings are dropped.
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Table 1. Dominant plant species

Tree	Not specified
Shrub	(1) <i>Atriplex confertifolia</i> (2) <i>Ambrosia dumosa</i>
Herbaceous	(1) <i>Achnatherum hymenoides</i>

Physiographic features

This site occurs on alluvial fans, stream terraces, and lake terraces situated along a river flowing through a relict lakebed. Elevations are 3600 to 4300 feet. Slopes range from 0 to 5 percent.

Table 2. Representative physiographic features

Landforms	(1) Alluvial plain > Alluvial fan (2) River valley > Stream terrace (3) River valley > Lake terrace
Runoff class	Negligible to very low
Flooding duration	Very brief (4 to 48 hours)
Flooding frequency	None to rare
Elevation	1,100 – 1,310 m
Slope	0 – 10 %

Aspect	Aspect is not a significant factor
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Climatic features

The climate on this site is characterized by mild cool winters (30 to 60 degrees F) and hot dry summers (70 to 100 degrees F). The average annual precipitation ranges from 4 to 6 inches, with most falling as rain from November to March. The average frost-free period is 200 to 225 days.

Table 3 Representative climatic features

Frost-free period (characteristic range)	190 days
Freeze-free period (characteristic range)	210 days
Precipitation total (characteristic range)	130 mm
Frost-free period (actual range)	190 days
Freeze-free period (actual range)	210 days
Precipitation total (actual range)	130 mm
Frost-free period (average)	190 days
Freeze-free period (average)	210 days
Precipitation total (average)	130 mm

- (1) INDEPENDENCE [USC00044232], Independence, CA

Influencing water features

Soil features

The soils that characterize this site are very deep and well-drained to somewhat excessively drained. They are formed in mixed alluvium. Surface textures are loamy sands and sands. Available water capacity is low to moderate and the hazard of water erosion is slight to moderate. Wind erosion hazard is moderate to severe. Effective rooting depth is 60 inches or more.

Table 4. Representative soil features

Parent material	(1) Alluvium
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Ecological dynamics

When mismanagement results in overgrazing, shadscale and white bursage increase while allscale, budsage, and Indian ricegrass decrease. Species likely to invade this site are white burrobush and Russian thistle. Allscale will dominate on abandoned agricultural land

and other disturbed sites.

Reduce the hazard of wind erosion by avoiding overgrazing, preserving the existing plant cover, and limiting the operation of off-road vehicles.

Major poisonous plants at this site are, Black greasewood and Desert princesplume.

Fire is very infrequent due to the sparse plant cover.

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 (%)
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Table 6. Community 1.2 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
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Table 7. Community 2.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
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Table 8. Community 2.2 plant community composition

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

Occasional use by Tule elk LIVESTOCK GRAZING: This site is primarily used for spring grazing. Annual forbs are abundant in years of above average precipitation. General Guide to Initial Stocking Rate: Before making specific recommendations, an on site evaluation must be made. POUNDS/ACRE air dry AUM/AC AC/AUM Normal Years 250 20-25

Hydrological functions

Runoff is slow. The erosion hazard is slight to moderate. Soil Series: Cajon Hydrologic Group: A Hydrologic Conditions and Runoff Curves: Good 41; Fair 46; Poor 61 Soil Series: Yellowrock Hydrologic Group: A Hydrologic Conditions and Runoff Curves: Good 41; Fair 46; Poor 61 Soil Series: Eclipse Hydrologic Group: B Hydrologic Conditions and Runoff Curves: Good 63; Fair 66; Poor 76 Soil Series: Mazourka Hydrologic Group: B Hydrologic Conditions and Runoff Curves: Good 63; Fair 66; Poor 76 Soil Series: Seaman Hydrologic Group: B Hydrologic Conditions and Runoff Curves: Good 63; Fair 66; Poor 76

Recreational uses

This site is located on City of Los Angeles, Department of Water and Power (LADWP) property, and is open to public use.

Type locality

Location 1: Inyo County, CA	
Township/Range/Section	T13S R35E S13
General legal description	SE 1/4 Sec. 13, T13S, R35E 4 1/2 miles east of Independence, Inyo Co., CA

Other references

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).

Contributors

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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	09/15/2026
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:
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17. Perennial plant reproductive capability:
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