

Ecological site R040XD015CA Limy 4-6" 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.

Ecological site concept

This site occurs on alluvial fan, inset fans and washes. Elevation ranges from 500 to 2800 feet. This site occurs on alluvial fans. Soils consist of very deep, excessively drained soils formed in stratified alluvium from mixed sources and of very deep, excessively drained soils that formed in stratified fan alluvium.

Associated sites

R040XD010CA	Valley Wash This site can occur in large adjacent drainages.
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Table 1. Dominant plant species

Tree	Not specified
Shrub	(1) <i>Larrea tridentata</i> (2) <i>Ambrosia dumosa</i>
Herbaceous	(1) <i>Plantago ovata</i>

Physiographic features

This site occurs on alluvial fan, inset fans and washes.

Table 2. Representative physiographic features

Landforms	(1) Alluvial fan (2) Inset fan (3) Wash
Flooding duration	Extremely brief (0.1 to 4 hours) to very brief (4 to 48 hours)
Flooding frequency	Rare to occasional
Elevation	500–2,800 ft
Slope	2–5%
Aspect	Aspect is not a significant factor

Climatic features

The Colorado Desert of California represents the northwesternmost portion of the Sonoran Desert. The subtropical Colorado Desert results from the descent of cold air which is heated by compression and arrives hot and dry at the earth's surface. Precipitation is frontal in nature during the winter and convectional in the summer. Reduced summer rainfall and high potential evapotranspiration make the Colorado Desert one of the most arid regions in North America. Summer temperatures frequently exceed 105 degrees F. The average annual precipitation ranges

from 2 to 6 inches with most falling as rain. Snowfall is rare. Approximately 35% of the annual precipitation occurs from July to September as a result of intense convection storms. Spring months are the windiest.

Table 3. Representative climatic features

Frost-free period (characteristic range)	365 days
Freeze-free period (characteristic range)	365 days
Precipitation total (characteristic range)	4-5 in
Frost-free period (actual range)	365 days
Freeze-free period (actual range)	365 days
Precipitation total (actual range)	4-6 in
Frost-free period (average)	365 days
Freeze-free period (average)	365 days
Precipitation total (average)	5 in

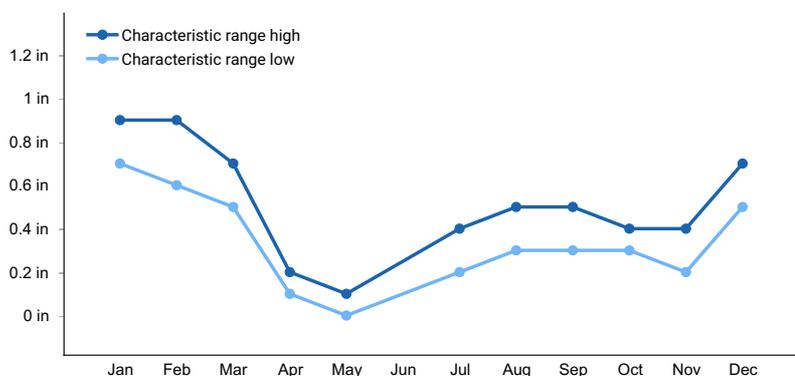


Figure 1. Monthly precipitation range

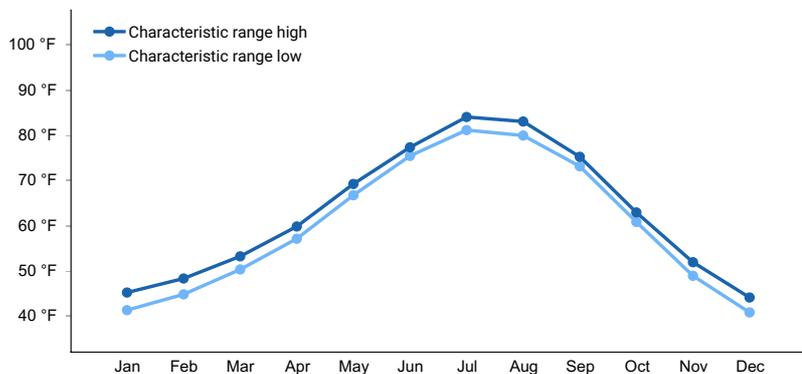


Figure 2. Monthly minimum temperature range

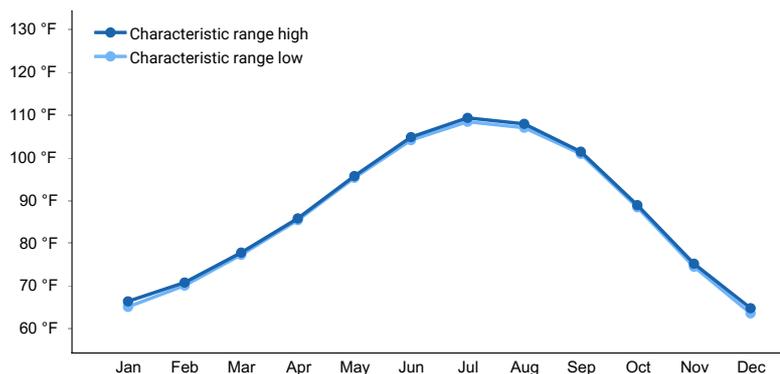


Figure 3. Monthly maximum temperature range

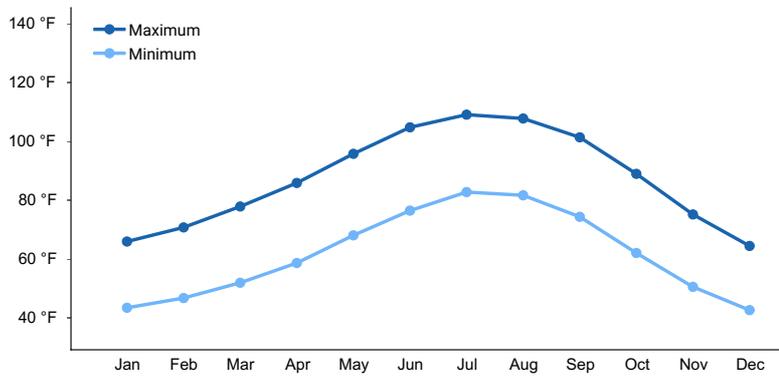


Figure 4. Monthly average minimum and maximum temperature

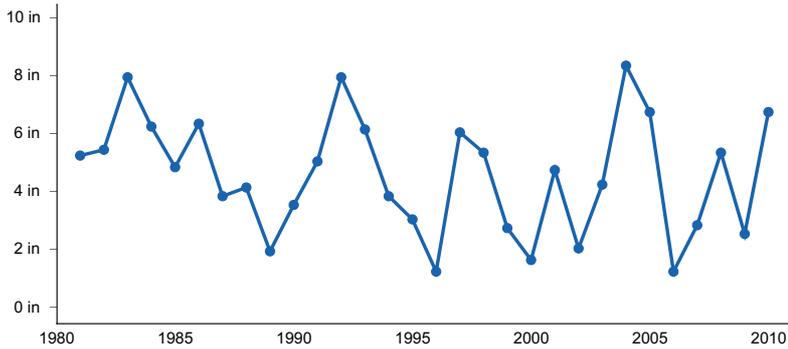


Figure 5. Annual precipitation pattern

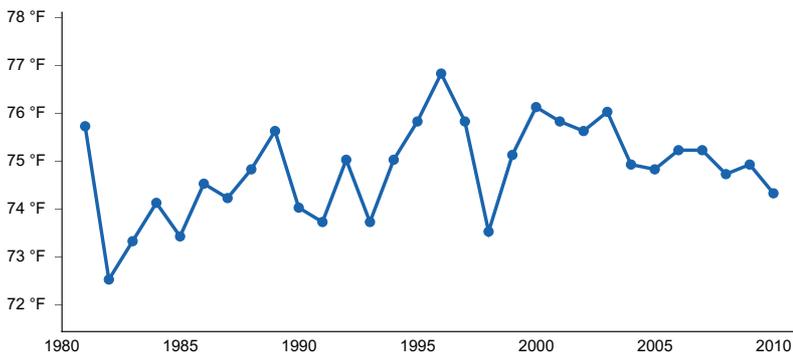


Figure 6. Annual average temperature pattern

Climate stations used

- (1) LAKE HAVASU CITY [USC00024761], Lake Havasu City, AZ
- (2) PARKER RSVR [USC00046699], Parker Dam, CA
- (3) IRON MTN [USC00044297], Vidal, CA

Influencing water features

Soil features

This site occurs on alluvial fans. Soils consist of very deep, excessively drained soils formed in stratified alluvium from mixed sources and of very deep, excessively drained soils that formed in stratified fan alluvium. Soils series include Carrizo and Riverbend.

Table 4. Representative soil features

Surface texture	(1) Extremely gravelly sandy loam
Family particle size	(1) Sandy

Drainage class	Moderately well drained to excessively drained
Permeability class	Moderate to moderately rapid
Soil depth	40–80 in
Surface fragment cover <=3"	70–91%
Surface fragment cover >3"	3–10%
Available water capacity (0-40in)	1.77–2.95 in
Calcium carbonate equivalent (0-40in)	7–25%
Electrical conductivity (0-40in)	0–2 mmhos/cm
Sodium adsorption ratio (0-40in)	0–4
Soil reaction (1:1 water) (0-40in)	7.4–8.4
Subsurface fragment volume <=3" (Depth not specified)	37–51%
Subsurface fragment volume >3" (Depth not specified)	2–3%

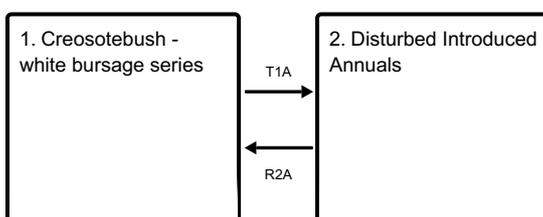
Ecological dynamics

This creosotebush site is widespread throughout the Sonoran Desert and consists of both long-lived and short-lived perennial species. In stable, old communities, creosotebushes (*Larrea tridentata*) or clones may attain ages of several thousand years. Defoliation and death of branches of creosotebush may occur as a result of long periods of intense moisture stress. Surface disturbance may reduce plant cover, density, and diversity of this site. These changes can be very subtle or extremely obvious depending on the intensity of disturbance, and an assortment of environmental factors (topography, rainfall, soil type). After surface disturbance, white bursage (*Ambrosia dumosa*) may initially increase and an invasion of non-native annual grasses and forbs such as Mediterranean grass (*Schismus arabicus*) and redstem stork's bill (*Erodium cicutarium*) may occur.

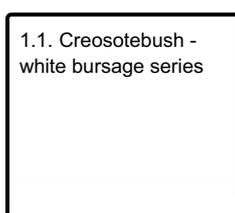
White burrobush (*Hymenoclea salsola*) is the primary perennial pioneer plant. Fire effects: Creosotebush is very flammable and is poorly adapted to fire, due to its limited re-sprouting ability. Factors such as season of burning, fuel quantity, fire intensity and age of existing shrubs will affect the ability of creosotebush to re-sprout. White bursage can also be killed by fire, however, it can rapidly reestablish from off-site seed.

State and transition model

Ecosystem states



State 1 submodel, plant communities



State 1
Creosotebush - white bursage series

Community 1.1
Creosotebush - white bursage series



Figure 7. Limy 4-6

The interpretative plant community is the historic climax community prior to European colonization. This site is co-dominated by creosotebush and white bursage, with white ratany as a minor shrub component. Perennial grasses are a minor component at most and often absent. Native annual forbs include desert Indianwheat (*Plantago ovata*) and cryptantha (*Cryptantha* spp.). Non-native forbs have invaded the site and include peppergrass (*Lepidium* spp.) and Mediterranean grass. The site occurs primarily on fan piedmonts but can also be found in some minor drainageways. Receiving slightly higher run-off and/or rainfall than other creosotebush-white bursage communities, it is a higher producing site. The potential plant community is 85% shrubs, 10% forbs, and 5% grasses. The total vegetation cover is 35%.

Table 5. Annual production by plant type

Plant Type	Low (Lb/Acre)	Representative Value (Lb/Acre)	High (Lb/Acre)
Shrub/Vine	100	139	185
Forb	0	9	12
Grass/Grasslike	0	2	3
Total	100	150	200

Table 6. Ground cover

Tree foliar cover	0%
Shrub/vine/liana foliar cover	25-30%
Grass/grasslike foliar cover	0-3%
Forb foliar cover	0-5%
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	10-15%
Grass/grasslike basal cover	0%
Forb basal cover	0%
Non-vascular plants	0%
Biological crusts	0%
Litter	5-10%
Surface fragments >0.25" and <=3"	65-70%
Surface fragments >3"	0%
Bedrock	1-2%
Water	0%
Bare ground	10-15%

Table 8. Canopy structure (% cover)

Height Above Ground (Ft)	Tree	Shrub/Vine	Grass/ Grasslike	Forb
<0.5	–	–	0-3%	0-5%
>0.5 <= 1	–	–	–	–
>1 <= 2	–	10-15%	–	–
>2 <= 4.5	–	10-15%	–	–
>4.5 <= 13	–	1-3%	–	–
>13 <= 40	–	–	–	–
>40 <= 80	–	–	–	–
>80 <= 120	–	–	–	–
>120	–	–	–	–

**State 2
Disturbed Introduced Annuals**

The disturbed state has a predominance of non-native annual grasses and forbs such as Mediterranean grass (*Schismus arabicus*) and redstem stork’s bill (*Erodium cicutarium*).

**Transition T1A
State 1 to 2**

After surface disturbance by grazing/browsing impacts, white bursage (*Ambrosia dumosa*) may initially increase and then eventually decrease giving away to introduced annuals. Fire may take out shrubs as well leading toward invasion of introduced species.

**Restoration pathway R2A
State 2 to 1**

White burrobush (*Hymenoclea salsola*) is the primary perennial pioneer plant. over time Creosote re-sprouts and expands.

Additional community tables

Table 9. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Lb/Acre)	Foliar Cover (%)
Shrub/Vine					
1	Native shrubs			100–185	
	burrobush	AMDU2	<i>Ambrosia dumosa</i>	44–85	–
	creosote bush	LATR2	<i>Larrea tridentata</i>	45–82	–
	white ratany	KRGR	<i>Krameria grayi</i>	11–18	–
Grass/Grasslike					
2	Native grass			0–3	
	sixweeks threeawn	ARAD	<i>Aristida adscensionis</i>	0–3	–
Forb					
3	Native Forbs			0–10	
	cryptantha	CRYPT	<i>Cryptantha</i>	0–6	–
	desert Indianwheat	PLOV	<i>Plantago ovata</i>	0–4	–
4	Opportunistic forbs			0–2	
	yellow pepperweed	LEFL2	<i>Lepidium flavum</i>	0–2	–

Animal community

This site is dominated by two shrubs highly valued by burrowing animals, creosotebush and white bursage. Desert tortoise, lizards, ground squirrels and other rodents all make burrows in the root-mounds of creosotebushes. The medium stature of creosotebushes also allow for some perching by both birds and rodents. The partially shaded apron around the creosotebush also gives rise to abundant annual plants when rainfall allows. This then provides a food source for the above-mentioned wildlife. White bursage, although not as well suited as creosote, also provides good burrowing among its roots and provides good cover from predators.

Recreational uses

This site is highly valued for open space and those interested in desert ecology. Desert tortoise, annual wildflowers and shrubs may also attract visitors during the spring months.

Other information

Non-native plants on this site include Mediterranean grass. This grass is rarely eaten by the native animals and increases fire potential, providing a fuel load in between shrubs.

Type locality

Location 1: San Bernardino County, CA	
UTM zone	N
UTM northing	3808638
UTM easting	718563
Latitude	34° 23' 45"
Longitude	114° 37' 20"
General legal description	The type locality is within the southern Chemehuevi Wash OHV area. The site occurs about 1/2 mile east of CA HWY 95.

Other references

NDDDB/Holland, R.F. 1986. Preliminary Descriptions of the Terrestrial Natural Communities of California - Mojave

Contributors

Heath McAllister

Approval

Kendra Moseley, 3/04/2025

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	04/21/2025
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:**
-
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:**
-