USDA Natural Resources
Conservation Service

Ecological site R030XY162CA
Salty Lakeplain 5-7" p.z.

Last updated: 2/24/2025
Accessed: 05/10/2025

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 lake plains. Soils for this site are silty soils derived from lacustrine deposits. Permeability is slow to very slow, and runoff is negligible.

Please refer to group concept R030XB025CA to view the provisional STM.

Associated sites

R030XY160CA	**Gypsic Terrace 5-7" p.z.** Occurs on gypsic areas of the lakebed.
R030XY163CA	**Loamy Lakeplain 5-7" p.z.** Occurs on adjacent dune areas in the dry lake periphery.

Table 1. Dominant plant species

Tree	Not specified
Shrub	(1) *Suaeda moquinii* (2) *Allenrolfea occidentalis*
Herbaceous	Not specified

Physiographic features

This site occurs on lake plains.

Table 2. Representative physiographic features

Landforms	(1) Lake plain
Flooding duration	Extremely brief (0.1 to 4 hours) to very brief (4 to 48 hours)
Flooding frequency	None to very rare
Ponding duration	Very brief (4 to 48 hours) to brief (2 to 7 days)
Ponding frequency	Rare to occasional
Elevation	2,000–3,000 ft
Slope	0–2%
Ponding depth	0–2 in
Water table depth	80 in
Aspect	Aspect is not a significant factor

Climatic features

The Mojave Desert experiences clear, dry conditions for a majority of the year. Winter temperatures are mild, summer temperatures are hot, and seasonal and diurnal temperature fluctuations are large. Monthly minimum temperature averages range from 30 to 80 degrees F (-1 to 27 degrees C). Monthly maximum temperature averages range from 60 to 110 degrees F (16 to 43 degrees C) (CSU 2002).

Average annual rainfall is between 2 and 8 inches (50 to 205 millimeters) (USDA 2006). Snowfall is more common at elevations above 4000 feet (1220 meters), but it may not occur every year (WRCC 2002b). The Mojave Desert receives precipitation from two sources. Precipitation falls primarily in the winter as a result of storms originating in the northern Pacific Ocean. The Sierra Nevada and Transverse Ranges create a rain shadow effect, causing little precipitation to reach the Mojave Desert. Sporadic rainfall occurs during the summer as a result of convection storms formed when moisture from the Gulf of Mexico or Gulf of California moves into the region. Summer rainfall is more common and has a greater influence on soil moisture in the eastern Mojave Desert.

Windy conditions are also common in the Mojave Desert, particularly in the west and central Mojave Desert. Spring is typically the windiest season, with winds averaging 10-15 miles per hour (WRCC 2002a). Winds in excess of 25 miles per hour and gusts in excess of 50 miles per hour are not uncommon (CSU 2002).

In the BLM Grazing Allotments Soil Survey (Northeast Part of Mojave Desert Area, CA (CA805)), most areas receive approximately 5 to 7 inches of precipitation annually (WRCC 2002b). At elevations above 4000 feet (1370 meters), average annual precipitation in the form of rain may reach 8 inches or more, and average annual snowfall may reach up to 10 inches (WRCC 2002b).

The data from the following climate stations were used to describe the climate in the BLM Grazing Allotments Soil Survey (station number in parentheses):
Pahrump, NV (265890)
Mountain Pass, CA (045890)
Searchlight, NV (267369)
Red Rock Canyon State Park, NV (266691)

"Maximum monthly precipitation" represents average monthly precipitation.

Table 3. Representative climatic features

Frost-free period (average)	240 days
Freeze-free period (average)	282 days
Precipitation total (average)	7 in

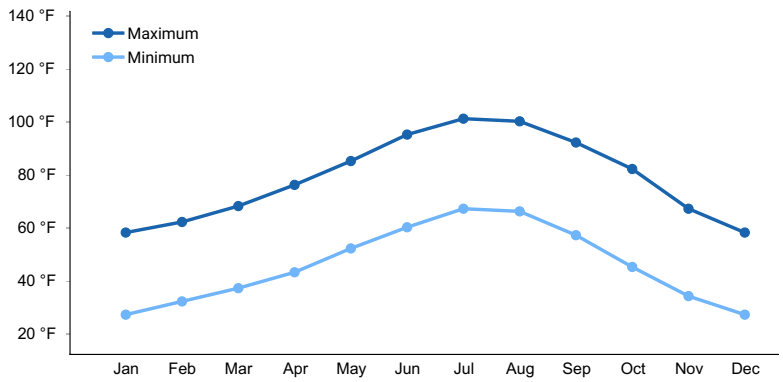

Figure 1. Monthly average minimum and maximum temperature

Influencing water features

Soil features

Soils for this site are silty soils derived from lacustrine deposits. Permeability is slow to very slow, and runoff is negligible. Ponding occurs rarely for brief periods (2-7 days) following storms. Soils are classified as Typic Haplosalids. These soils are adjacent to the actual dry lake bed and therefore have properties similar to soils on the lake bed, i.e. finer textures, high salinity and sodicity, etc.

Soil survey area - Map unit - Component
CA805 - 4765 - Typic Haplosalids

Table 4. Representative soil features

Surface texture	(1) Silty clay (2) Silty clay loam
Family particle size	(1) Clayey
Drainage class	Moderately well drained to well drained
Permeability class	Slow to very slow
Soil depth	60–80 in
Surface fragment cover <=3"	10–15%
Surface fragment cover >3"	0%
Available water capacity (0-40in)	6–10 in
Calcium carbonate equivalent (0-40in)	1–5%
Electrical conductivity (0-40in)	45–99 mmhos/cm
Sodium adsorption ratio (0-40in)	35–200
Soil reaction (1:1 water) (0-40in)	7.8–8.2
Subsurface fragment volume <=3" (Depth not specified)	0–15%
Subsurface fragment volume >3" (Depth not specified)	0%

Ecological dynamics

Please refer to group concept R030XB025CA to view the provisional STM.

This ecological site occurs on lake plains. The dominant species on this ecological site are Mojave seablite (*Suaeda moquinii*) and iodine bush (*Allenrolfea occidentalis*). Mojave seablite (*Suaeda moquinii*) is a common colonizer of dry lakes where salt and sodium levels are high (Vasek and Lund 1980). Iodine bush (*Allenrolfea occidentalis*) is also a halophytic species (Barbour et al. 1979).

Vegetation changes to this ecological site are slow because high salinity and sodicity limit the establishment of non-halophytic species. Mojave seablite can locally alter soil chemical properties such that they become more suitable for other species (Vasek and Lund 1980).

Biological soil crusts—slow-growing complexes of fungi, lichen, moss, and cyanobacteria—comprise ~10% of the cover on this ecosite. They indicate site stability and recover slowly following disturbance (Belnap and Lange 2001). They moderate several processes that occur in the desert (Belnap and others 2001). These processes include reducing water and wind erosion. They act like a living mulch and slow evaporative water loss. They also affect soil fertility by increasing the available nitrogen in the soil. By occupying spaces between shrubs, biological soil crusts limit the establishment of invasive species that change disturbance regimes. The presence of biological soil crusts on this ecosite suggest that disturbance on this ecosite historically was not severe.

Invasive species red brome (*Bromus rubens*) and Mediterranean grass (*Schismus arabicus*) are present in small amounts on this ecosite, accounting for ~5% of vegetative cover and <5% of the annual production. Spread of these species contributes to higher ground cover and may reduce erosion, but may also alter ecosite dynamics. Fires have historically been infrequent and confined to small areas due to widely spaced shrubs and discontinuous fuels. Spread of these species will create a more continuous, easily ignited fuel load, increasing the risk that fires will carry over larger areas (Rundel and Gibson 1996).

The two dominant species on this ecological site are of poor forage quality for domestic livestock (USFS 2005), but fourwing saltbush is of moderate value (Sampson and Jesperson 1963). Alkali sacaton (*Sporobolus airoides*) is a valuable forage species, but it only occurs in small amounts on this ecosite. Because most of the forage is unsuitable for livestock use, grazing use and its impacts on plants would likely be minimal. Biological soil crusts may be most seriously affected by trampling.

State and transition model

Ecosystem states

1. Mojave Seablite - Iodinebush

State 1 submodel, plant communities

1.1. Mojave Seablite - Iodinebush

State 1
Mojave Seablite - Iodinebush

Community 1.1
Mojave Seablite - Iodinebush

The interpretive plant community is the reference plant community prior to European colonization. Species diversity on this ecosite is low. Vegetation cover at this site is dominated by Mojave seablite (*Suaeda moquinii*) and iodine bush (*Allenrolfea occidentalis*). Other species present on this ecosite in small amounts are alkali sacaton (*Sporobolus airoides*) and several saltbush species (Atriplex spp.) Cryptogamic crusts cover ~10% of this ecosite. “Percent Composition by Frequency of Overstory Species” represents only low, RV, and high canopy cover. Production values are not listed.

Table 5. Annual production by plant type

Plant Type	Low (Lb/Acre)	Representative Value (Lb/Acre)	High (Lb/Acre)
Shrub/Vine	75	148	247
Grass/Grasslike	0	2	3
Total	**75**	**150**	**250**

Table 6. Ground cover

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

Grass/grasslike foliar cover	0-1%
Forb foliar cover	0%
Non-vascular plants	0%
Biological crusts	4-8%
Litter	5-10%
Surface fragments >0.25" and <=3"	0%
Surface fragments >3"	0%
Bedrock	0%
Water	0%
Bare ground	65-75%

Table 7. Canopy structure (% cover)

Height Above Ground (Ft)	Tree	Shrub/Vine	Grass/ Grasslike	Forb
<0.5	–	10-15%	–	–
>0.5 <= 1	–	40-60%	–	–
>1 <= 2	–	7-10%	–	–
>2 <= 4.5	–	7-10%	0-3%	–
>4.5 <= 13	–	2-5%	–	–
>13 <= 40	–	–	–	–
>40 <= 80	–	–	–	–
>80 <= 120	–	–	–	–
>120	–	–	–	–

Additional community tables

Table 8. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Lb/Acre)	Foliar Cover (%)
Shrub/Vine					
1	**Perennial Shrubs**			75–247	
	Mojave seablite	SUMO	*Suaeda moquinii*	49–162	–
	iodinebush	ALOC2	*Allenrolfea occidentalis*	15–50	–
	fourwing saltbush	ATCA2	*Atriplex canescens*	8–28	–
	big saltbush	ATLE	*Atriplex lentiformis*	2–4	–
	shadscale saltbush	ATCO	*Atriplex confertifolia*	1–3	–
Grass/Grasslike					
2	**Perennial Grasses**			0–3	
	alkali sacaton	SPAI	*Sporobolus airoides*	0–3	–

Animal community

Forage and cover on this ecosite are poor for wildlife and livestock use.

Hydrological functions

This ecological site occurs in low positions in the landscape, and water from adjacent areas will drain toward this

area.

Recreational uses

Off highway vehicle use occurs on the lake plain. This disturbance may decrease shrub abundance, particularly smaller, more easily trampled shrubs. Intensive use can significantly reduce overall vegetation cover. Disturbed ground may be more easily colonized by invasive species. Biological crusts are fragile, easily damaged, and very slow to recover following disturbance.

Inventory data references

Vegetation cover was sampled in lieu of production due to a poor growing season. Ten 100-foot point-intercept transects were sampled on 22 March 2006 at the type locality. The top two tiers of vegetation or other cover class (e.g. bare soil, gravel, rock, litter, biological soil crust) were recorded at every foot.

Annual production numbers were estimated based on similar ecological sites.

Type locality

Location 1: San Bernardino County, CA	
UTM zone	N
UTM northing	3955036
UTM easting	624239
Latitude	35° 43′ 53″
Longitude	115° 37′ 34″
General legal description	Tbe type locality is located along the perimeter of Mesquite Lake.

Other references

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Contributors

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Approval

Sarah Quistberg, 2/24/2025

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	05/10/2025
Approved by	Sarah Quistberg
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

Indicators

1. **Number and extent of rills:**

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2. **Presence of water flow patterns:**

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3. **Number and height of erosional pedestals or terracettes:**

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4. **Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):**

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5. **Number of gullies and erosion associated with gullies:**

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6. **Extent of wind scoured, blowouts and/or depositional areas:**

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7. **Amount of litter movement (describe size and distance expected to travel):**

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8. **Soil surface (top few mm) resistance to erosion (stability values are averages - most sites will show a range of values):**

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9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):**

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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:**
