USDA Natural Resources
Conservation Service

Ecological site R030XY157CA
Sodic Flat 3-5" p.z.

Last updated: 3/10/2025
Accessed: 05/13/2025

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.

Classification relationships

California Natural Diversity Database, May 2002. List of California terrestrial natural communities recognized by the California Natural Diversity Database – Desert Bush Seepweed shrub.

Sawyer, J.O. and T. Keeler-Wolf. 1995. Manual of California Vegetation – Bush Seepweed Series.

Ecological site concept

This site occurs on nearly level lake plains. The soils that characterize this site are very deep and well drained. These soils are saline and sodic.

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

Associated sites

R030XY156CA	**Sodic Loam 3-5" p.z.** Sodic Loam 3-5” P.Z. Occurs on alluvial flats.

Table 1. Dominant plant species

Tree	Not specified
Shrub	(1) *Suaeda moquinii*
Herbaceous	Not specified

Physiographic features

This site occurs on nearly level lake plains.

Table 2. Representative physiographic features

Landforms	(1) Lake plain
Flooding duration	Very brief (4 to 48 hours)
Flooding frequency	Very rare
Ponding duration	Very brief (4 to 48 hours)
Ponding frequency	Rare
Elevation	786–853 m
Slope	0–2%

Ponding depth	3–10 cm
Water table depth	152 cm
Aspect	Aspect is not a significant factor

Climatic features

The primary air masses affecting California are cold maritime polar air from the Gulf of Alaska and warmer, moist maritime subtropical air from lower latitudes. Occasionally there are invasions of cold continental polar air from northern Canada or the Rocky Mountains. Precipitation in the area results primarily from the passage of cyclones with associated fronts during fall, winter and spring; from closed cyclones in late winter and spring; and from the flow of moist tropical air from the southeast to the southwest quadrant in the summer.

Barstow Fire Station, occurs at a lower elevation and has a long-term record from 1980 to 2002. Twentynine Palms Station, occurs at a lower elevation and has a long-term record from 1948 to 2002. This climate summary is based on data from both locations. Warm, moist winters (35 to 70 degrees F) and hot, dry summers (60 to 105 degrees F) characterize the climate on this site. Mean annual air temperature is 65 to 70 degrees F. The average annual precipitation is 3 to 5 inches, with most falling as rain from December through March. Approximately 20 to 45% of the annual precipitation occurs from July to September as a result of intense, convection storms.

Table 3. Representative climatic features

Frost-free period (average)	340 days
Freeze-free period (average)	
Precipitation total (average)	127 mm

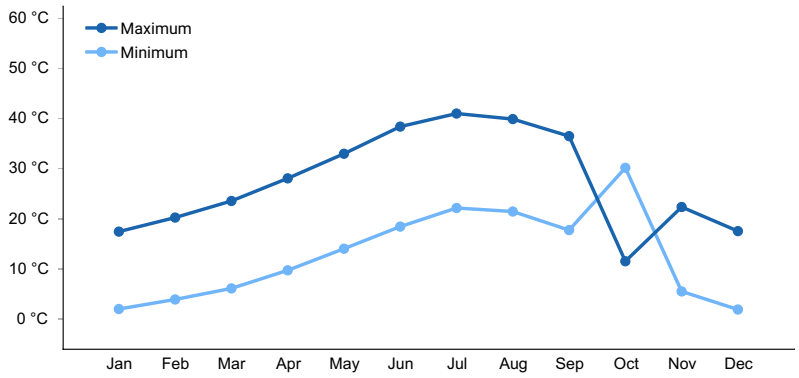

Figure 1. Monthly average minimum and maximum temperature

Influencing water features

There are no influencing water features associated with this site.

Soil features

The soils that characterize this site are very deep and well drained. These soils are saline and sodic. Available water capacity is very low (due to salinity) and permeability is slow. Effective rooting depth is 60 inches ot more. Water tables are greater than 60 inches.

Soils:
6984702 Calcic Haplosalids-Sodic Haplocalcids complex, 2.8%. Calcic Haplosalids. Johnson Valley OHV Area Soil Survey.

6984730 Calcic Haplosalids-Sodic Haplocalcids-Typic Haplosalids complex, 0-2%. Calcic Haplosalids. Johnson Valley OHV Area Soil Survey.

Table 4. Representative soil features

Surface texture	(1) Silty clay loam (2) Sandy loam
Family particle size	(1) Clayey
Drainage class	Well drained
Permeability class	Slow
Soil depth	152 cm
Surface fragment cover <=3"	1–5%
Available water capacity (0-101.6cm)	0.76–1.52 cm
Calcium carbonate equivalent (0-101.6cm)	5–15%
Electrical conductivity (0-101.6cm)	20–40 mmhos/cm
Sodium adsorption ratio (0-101.6cm)	35–160
Soil reaction (1:1 water) (0-101.6cm)	8.6–9.2
Subsurface fragment volume <=3" (Depth not specified)	1–5%

Ecological dynamics

Please refer to group concept R030XY129CA to view the provisional STM.

The interpretive plant community for this site is the historic climax plant community. This site occurs on dry lake beds which are intermittently flooded. The historic site potential is characterized by a low, open shrubland dominated by Mojave seablite (*Suaeda moquinii*). Few other species occur. Perennial grasses and forbs are scarce. Annuals are seasonally present. Potential vegetative composition is approximately 5% grasses, 5% forbs, and 90% shrubs. This site is stable in this condition.

This site is characterized by low productivity with little plant diversity. Disturbance would allow for the introduction of non-native annuals such as cheatgrass (*Bromus tectorum*) and Russian thistle (*Salsola tragus*).

State and transition model

Ecosystem states

1. Mojave seablite

State 1 submodel, plant communities

1.1. Mojave seablite

State 1

Mojave seablite

Community 1.1
Mojave seablite

Figure 2. Sodic Flat

The interpretive plant community for this site is the historic climax plant community. This site occurs on dry lake beds which are intermittently flooded. The historic site potential is characterized by a low, open shrubland dominated by Mojave seablite (*Suaeda moquinii*). Few other species occur. Perennial grasses and forbs are scarce. Annuals are seasonally present. Potential vegetative composition is approximately 5% grasses, 5% forbs, and 90% shrubs. This site is stable in this condition. This list of plants and their relative proportions are based on near normal years. Fluctuations in species composition and relative production may change from year to year dependent upon abnormal precipitation or other climatic factors. The historic climax plant community has been determined by study of rangeland relict areas or other protected areas and historical accounts.

Table 5. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Shrub/Vine	75	149	252
Forb	4	10	15
Grass/Grasslike	4	9	13
Total	**83**	**168**	**280**

Table 6. Ground cover

Tree foliar cover	0%
Shrub/vine/liana foliar cover	1-5%
Grass/grasslike foliar cover	1%
Forb foliar cover	1%
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	0%
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"	1-5%
Surface fragments >3"	0%
Bedrock	0%
Water	0%
Bare ground	70-90%

Table 8. Canopy structure (% cover)

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

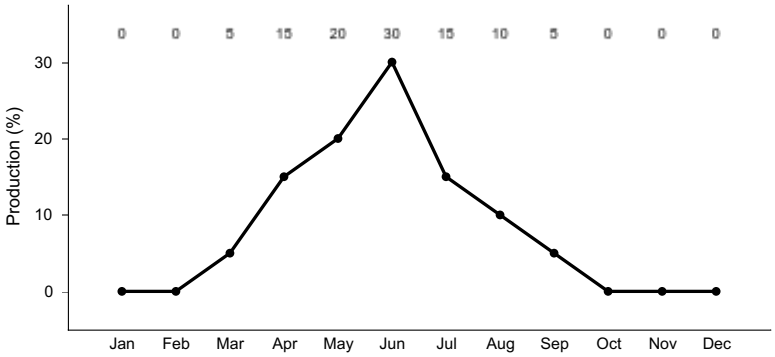

Figure 4. Plant community growth curve (percent production by month). CA3010, Mojave Seablite. Growth begins in early spring; flowering occurs from July to September..

Additional community tables

Table 9. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Kg/Hectare)	Foliar Cover (%)
Grass/Grasslike					
1	**Perennial grasses**			1–4	
	saltgrass	DISP	*Distichlis spicata*	1–4	–
2	**Annual grasses**			1–4	
	Grass, annual	2GA	*Grass, annual*	1–4	–
Forb					
3	**Perennial forbs**			1–11	
	Forb, perennial	2FP	*Forb, perennial*	1–11	–
	desert princesplume	STPI	*Stanleya pinnata*	1–4	–
4	**Annual forbs**			1–4	
	Forb, annual	2FA	*Forb, annual*	1–3	–
Shrub/Vine					
5	**Dominant shrubs**			174–228	
	Mojave seablite	SUMO	*Suaeda moquinii*	174–228	–
6	**Other shrubs**			1–12	
	Shrub, evergreen	2SE	*Shrub, evergreen*	1–12	–
	fourwing saltbush	ATCA2	*Atriplex canescens*	1–6	–
	cattle saltbush	ATPO	*Atriplex polycarpa*	1–6	–

Animal community

Grazing: This site has limited use for livestock grazing due to low productivity, unsuitable forage, and lack of stockwater. Mojave seablite is considered poor forage for livestock.

Wildlife: This site has low species diversity. Small mammals, coyotes, and black-tailed jackrabbits may occur. Common lizards include western whiptails. Common birds include horned larks and common ravens. Mojave seablite is used by Black-tailed jackrabbits, non-game birds and small mammals, but the degree of utilization is unknown. Shadscale is a desirable shrub for Black-tailed jackrabbits, non-game birds and small mammals.

Hydrological functions

Intermittent flooding occurs after convective summer storms.

Recreational uses

High off-road vehicle usage due to proximity to dry lake beds. Dry lake beds are prime locations for off-highway vehicle use and campsites.

Inventory data references

Line transects: 2 from 7/02 to 8/02 in San Bernardino, California.

NV-ECS:1 8/02 in San Bernardino, California.

Type locality

Location 1: San Bernardino County, CA	
UTM zone	N
UTM northing	3810192

UTM easting	540049
Latitude	34° 25′ 56″
Longitude	116° 33′ 50″
General legal description	Melville Lake, Johnson Valley, California. Elevation 2755 feet.

Other references

Hickman, J.C. (ed).1993. The Jepson Manual: Higher plants of California. University of California Press, Berkeley, CA.

U.S. Department of Agriculture, NRCS. National Range and Pasture Handbook, September 1997.

U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory. 2002. Fire Effects Information System [Online] Available: http://www.fs.fed.us/database/feis/plants)

Western Regional Climate Center, Desert Research Institute, Reno, Nevada (http://www.wrcc.dri.edu/index.html)

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	05/13/2025
Approved by	Sarah Quistberg
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:**

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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):**

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:**