USDA Natural Resources
Conservation Service

Ecological site R030XY158CA
Sodic Bottom 3-5" p.z.

Last updated: 2/24/2025
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 Saltbrush Scrub.

Sawyer, J.O. and T. Keeler-Wolf. 1995. Manual of California Vegetation – No series described.

Ecological site concept

This site occurs on hummocky lake plains. The soils associated with this site are well drained and very deep. These soils are saline and sodic.

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

Associated sites

R030XY047NV	**ALLUVIAL PLAIN** Alluvial Plain Occurs on adjacent hummocks.
R030XY156CA	**Sodic Loam 3-5" p.z.** Sodic Loam 3-5” P.Z. Occurs on lake plains.

Similar sites

R030XY047NV	**ALLUVIAL PLAIN** Alluvial Plain ATPO is the dominant shrub.

Table 1. Dominant plant species

Tree	Not specified
Shrub	(1) *Atriplex torreyi* (2) *Atriplex confertifolia*
Herbaceous	(1) *Malacothrix glabrata*

Physiographic features

This site occurs on hummocky lake plains.

Table 2. Representative physiographic features

Landforms	(1) Lake plain

Ponding duration	Very brief (4 to 48 hours)
Ponding frequency	Rare
Elevation	786–853 m
Slope	0–4%
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

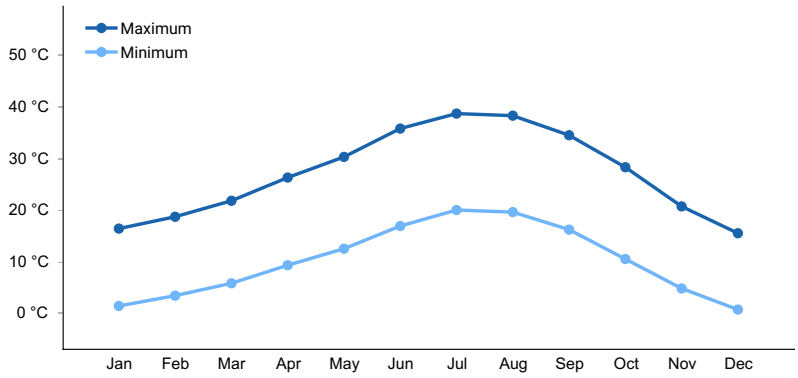

Figure 1. Monthly average minimum and maximum temperature

Influencing water features

There are no influencing water features associated with this site.

Soil features

The soils associated with this site are well drained and very deep. 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 or more. Water tables are greater than 60 inches.

Soils:

Mojave Desert Area, West Central Part Soil Survey Area (CA698): Typic Haplosalids, MU 4702 (minor component).

Table 4. Representative soil features

Surface texture	(1) Silty clay
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)	5–8%
Electrical conductivity (0-101.6cm)	10–60 mmhos/cm
Sodium adsorption ratio (0-101.6cm)	6–20
Soil reaction (1:1 water) (0-101.6cm)	8–9.2
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. The historic site potential is characterized a continuous canopy of shrubs, 0.5 to 1.5 meters tall. This community is dominated by Torrey saltbush (*Atriplex torreyi*). The understory is sparse. Perennial grasses that may occur include saltgrass (*Distichlis spicata*) and alkali sacaton (*Sporobolus airoides*). The majority of annuals are winter annuals that are especially abundant after winters of above average precipitation. Potential vegetative composition is approximately 5% grasses, 5% forbs and 90% shrubs. This site is stable in this condition.

Torrey saltbush is a phreatophyte and halophyte found along valley bottoms and margins of dry lakebeds. Mature plants produce an abundance of seeds that readily germinate without pretreatment or light, allowing this species to quickly colonize disturbed sites. Torrey saltbush is an invader of alkaline meadows where groundwater tables have been altered.

Fire effects: Most North American species of Atriplex are highly tolerant of fire. If top-killed they sprout prolifically.

State and transition model

Ecosystem states

1. Desert Saltbush Scrub

State 1 submodel, plant communities

1.1. Desert Saltbush Scrub

State 1
Desert Saltbush Scrub

Community 1.1
Desert Saltbush Scrub

Figure 2. Sodic Bottom

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Table 5. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Shrub/Vine	767	983	1196
Forb	16	21	27
Grass/Grasslike	1	4	11
Total	**784**	**1008**	**1234**

Table 6. Ground cover

Tree foliar cover	0%
Shrub/vine/liana foliar cover	15-20%
Grass/grasslike foliar cover	0-1%
Forb foliar cover	0-1%
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	15-25%
Surface fragments >0.25" and <=3"	0-5%
Surface fragments >3"	0%
Bedrock	0%
Water	0%
Bare ground	50-80%

Table 8. Canopy structure (% cover)

Height Above Ground (M)	Tree	Shrub/Vine	Grass/ Grasslike	Forb
<0.15	–	–	–	–
>0.15 <= 0.3	–	–	1-5%	–
>0.3 <= 0.6	–	–	–	1-5%
>0.6 <= 1.4	–	30-35%	–	–
>1.4 <= 4	–	–	–	–
>4 <= 12	–	–	–	–
>12 <= 24	–	–	–	–
>24 <= 37	–	–	–	–
>37	–	–	–	–

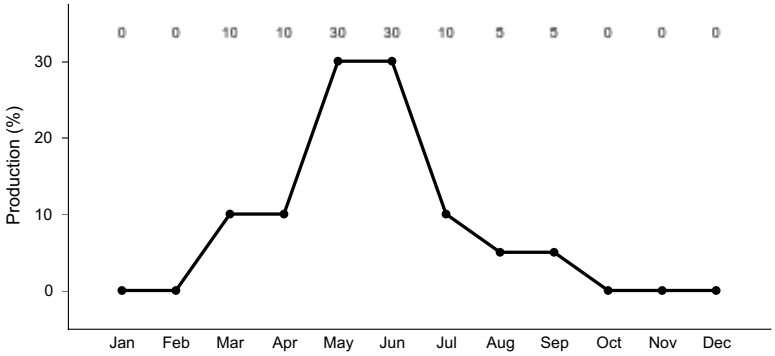

Figure 4. Plant community growth curve (percent production by month).

CA3032, Torrey Saltbush. Growth begins in spring: flowering occurs from June to September. Fruits mature from September to October. Maximum growth occurs in early summer..

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**			0–4	
	saltgrass	DISP	*Distichlis spicata*	0–2	–
	alkali sacaton	SPAI	*Sporobolus airoides*	0–2	–
2	**Annual Grasses**			1–6	
	Grass, annual	2GA	*Grass, annual*	1–6	–
Forb					
3	**Perennial Forbs**			0–2	
	desert princesplume	STPI	*Stanleya pinnata*	0–2	–
4	**Annual Forbs**			16–25	
	smooth desertdandelion	MAGL3	*Malacothrix glabrata*	8–12	–
	New Mexico plumeseed	RANE	*Rafinesquia neomexicana*	8–12	–
Shrub/Vine					
5	**Dominant Shrubs**			744–1159	
	Torrey's saltbush	ATTO	*Atriplex torreyi*	475–740	–
	shadscale saltbush	ATCO	*Atriplex confertifolia*	269–419	–
6	**Other Shrubs**			24–37	
	fourwing saltbush	ATCA2	*Atriplex canescens*	8–12	–
	cattle saltbush	ATPO	*Atriplex polycarpa*	8–12	–
	Mojave seablite	SUMO	*Suaeda moquinii*	8–12	–

Animal community

Atriplex spp. are known for their high productivity and quality forage. Torrey saltbush is high in protein, fats, and carbohydrates. Forage quality is influenced by age and phenological stage at the time of harvest. Shadscale is often eaten during the early spring before spines mature.

The twigs and foliage of the saltbushes provide forage for mule deer and small mammals. The seeds are consumed by small mammals and birds. Torrey saltbush grows in dense stands providing fair to good cover for wildlife.

Torrey saltbush stems and seeds are desirable to Black-tailed jackrabbits, non-game birds and small mammals.

Shadscale is a desirable cover and forage species to Black-tailed jackrabbits, non-game birds and small mammals.

Recreational uses

Heavy off-road vehicle usage due to proximity to dry lake bed. Dry lake beds are heavily used for recreation in the survey area.

Inventory data references

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

Type locality

Location 1: San Bernardino County, CA	
UTM zone	N
UTM northing	3812663
UTM easting	537366
Latitude	34° 27′ 17″
Longitude	116° 35′ 32″
General legal description	Melville Lake, Johnson Valley, California. Elevation 2734 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

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	05/13/2025
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:**

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:**