

Ecological site R030XA031CA

Sodic Dunes 5-7" P.Z.

Last updated: 10/21/2024

Accessed: 05/12/2025

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 shallow dunes and sand ridges over lacustrine sediments on basin floors. Elevations are 2270 to 2375 feet. Slopes range from 0 to 15 percent.

The soils that characterize this site are very deep and somewhat excessively drained. They are formed in eolian deposits overlying lacustrine sediments. Surface textures are sands. The subsoils are sands about 17 inches thick. The substratum is fine sandy loam, sandy clay loam, and very fine sandy loam to 60 inches or more.

Associated sites

R030XA019CA	Dune 5-7" p.z. Dune 5-7
R030XA025CA	Saline Bottom Saline Bottom

Similar sites

R030XA025CA	Saline Bottom Saline Bottom [ATCO, ATSP dominant species]
R030XA019CA	Dune 5-7" p.z. Dune 5-7

Table 1. Dominant plant species

Tree	Not specified
Shrub	(1) <i>Atriplex canescens</i> (2) <i>Atriplex confertifolia</i>
Herbaceous	(1) <i>Sporobolus airoides</i>

Physiographic features

This site occurs on shallow dunes and sand ridges over lacustrine sediments on basin floors. Elevations are 2270 to 2375 feet. Slopes range from 0 to 15 percent.

Table 2. Representative physiographic features

Landforms	(1) Dune (2) Sand sheet
Flooding duration	Very brief (4 to 48 hours)

Flooding frequency	None to rare
Elevation	692–724 m
Slope	0–15%
Aspect	Aspect is not a significant factor

Climatic features

The climate on this site is characterized by cool, relatively dry 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. Mean annual air temperature is 60 to 64 degrees F.

The average frost free period is 200 to 250 days.

Table 3. Representative climatic features

Frost-free period (average)	250 days
Freeze-free period (average)	
Precipitation total (average)	152 mm

Influencing water features

Soil features

The soils that characterize this site are very deep and somewhat excessively drained. They are formed in eolian deposits overlying lacustrine sediments. Surface textures are sands. The subsoils are sands about 17 inches thick. The substratum is fine sandy loam, sandy clay loam, and very fine sandy loam to 60 inches or more. These soils are moderately to very strongly alkaline and calcareous throughout the profile. Available water capacity is moderate and the hazard of water erosion is slight. Wind erosion hazard is moderate to very severe. Effective rooting depth is 60 inches or more. A seasonal water table occurs at depths greater than 60 inches that supplies additional moisture to deep rooted grasses and shrubs.

Soil Map Units

106 Cajon-Challenger complex, 2-9% slopes
111 Challenger sand, 0-5% slopes
112 Challenger-Leuhman complex, 0-9% slopes
113 Destazo complex, 0-5% slopes
128 Leuhman-Challenger complex, 0-9% slopes
129 Leuhman-Challenger-Cajon complex, 0-15% slopes

Ecological dynamics

Please refer to group concept R030XA009CA to view general STM.

As ecological condition deteriorates, perennial grasses decrease and the xerophytic shrubs will dominate. Die-off of the phreatophytic shrubs and perennial grasses would occur with drawdown of the seasonal water table. The resultant loss of perennial cover would allow for the invasion of annual grasses and forbs such as schismus, red brome and filaree. Russian thistle and threadleaf snakeweed are also invaders of this site.

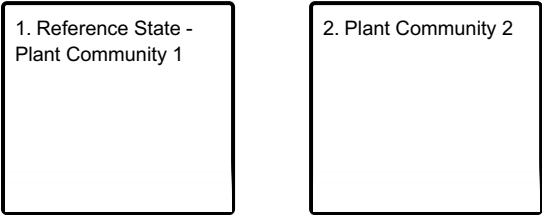
Black greasewood contains soluble oxalates which may cause poisoning and death if livestock consume a large amount in a short time period.

Fire is infrequent and is not recommended as a range management tool due to the sparse cover, severe hazard of wind erosion and slow recovery rates.

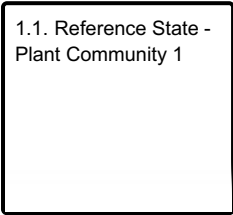
Water is the main limitation on this site. Water developments would greatly increase the diversity of species. Management, to reduce wind erosion, would be to protect it from excessive disturbance and maintain existing plant cover.

State and transition model

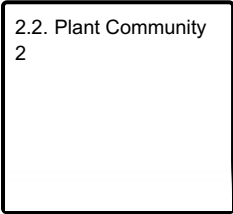
Ecosystem states



State 1 submodel, plant communities



State 2 submodel, plant communities



State 1
Reference State - Plant Community 1

Community 1.1
Reference State - Plant Community 1

The historic site potential is comprised of an open to fairly dense stand of perennial grasses and scattered shrubs, dominated by *Sporobolus airoides* and *Atriplex canescens*. Annuals are seasonally present. Total cover increases as the dunes are progressively stabilized. A perched water table maintains the growth of the phreatophytic species. This site is stable in this condition. The representative natural plant community is Stabilized and Partially-Stabilized Desert Dunes or Fourwing saltbush series. This community is dominated by fourwing saltbush, shadscale saltbush and alkali sacaton. Potential vegetative composition is about 40% grasses, 10% forbs, and 50% shrubs and trees. Annuals forbs and grasses are abundant in wet years. The following table lists the major plant species and percentages by weight, air dry, of the total plant community that each contributes in an average production year. Fluctuations in species composition and relative production may change from year to year dependent upon abnormal precipitation or other climatic factors.

Forest overstory. Allow no more than 3% of each species of this group, and no more than 15% in aggregate

Forest understory. Allow no more than 2% of each species of the grasses group, and no more than 8% in aggregate

Allow no more than 2% of each species of the forbs group, and no more than 8% in aggregate

Table 4. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Shrub/Vine	224	336	448
Grass/Grasslike	179	269	359
Forb	45	67	90
Total	448	672	897

Table 5. Ground cover

Tree foliar cover	0%
Shrub/vine/liana foliar cover	7-13%
Grass/grasslike foliar cover	6-10%
Forb foliar cover	1-3%
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%

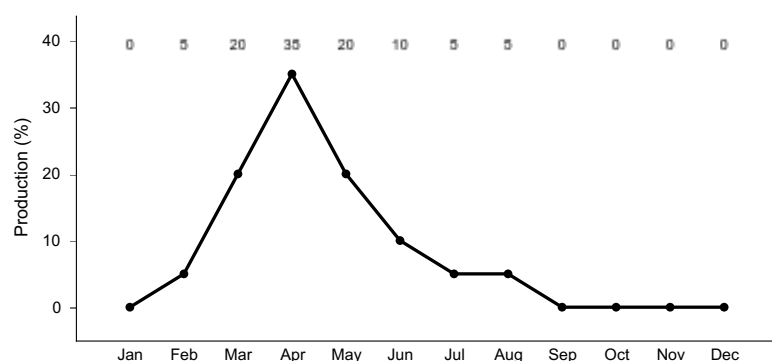


Figure 2. Plant community growth curve (percent production by month). CA3003, Shadscale. Growth starts in early spring. Flowering and seed set occur by July. Seeds stay on the shrub for several months. Dormancy occurs during the hot summer months..

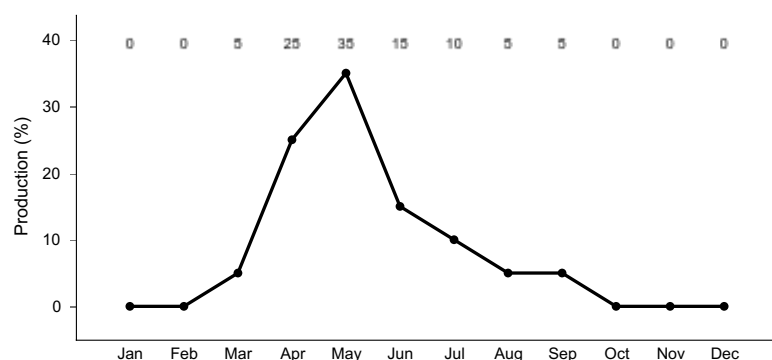


Figure 3. Plant community growth curve (percent production by month). CA3008, Fourwing saltbush. Growth begins in spring to early summer. Flowering occurs from May through September, and fruit ripens from October to December. Seed dispersal occurs from October through April. Seed may remain on the plants from one to two years..

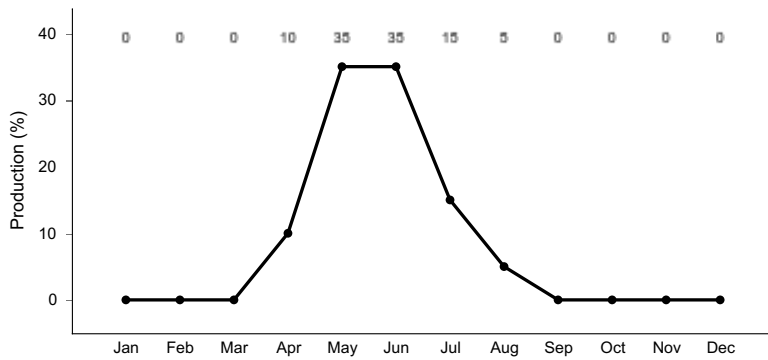


Figure 4. Plant community growth curve (percent production by month). CA3025, Saltgrass. Growth begins in spring and continues through early summer, setting seed in late summer..

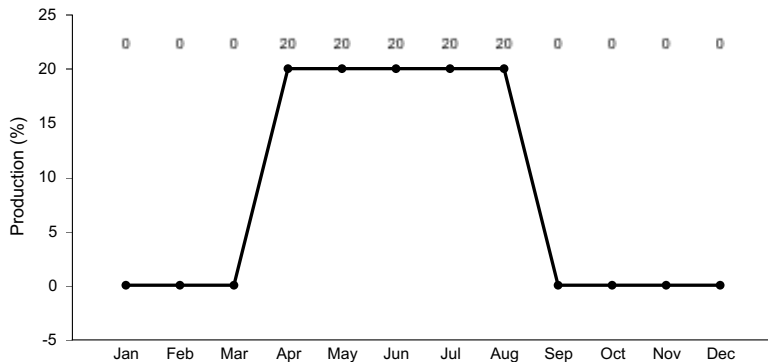


Figure 5. Plant community growth curve (percent production by month). CA3042, Alkalai sacaton. Growth begins in mid spring and continues through summer, setting seed in late summer..

State 2 Plant Community 2

Community 2.1 Plant Community 2

This plant community occurs across the western portion of the MLRA. Introduced annuals such as red brome, cheatgrass, schismus, and filaree have invaded the historic plant community and have become a dominant component of the understory. This change from native to non-natives may be due to a combination of factors such as (1) invasion of alien species, (2) watertable drawdown, and (3) drought. This site is unstable if basal cover falls below 10% and slopes are greater than 5%.

Additional community tables

Animal community

The soils of this site are well suited for small mammals such as ground squirrels and kangaroo rats. Population densities are above average on this site. The Joshua trees also provide song perches, lookout posts and nesting sites for birds. Other wildlife species occurring on this site include rabbits, coyotes, reptiles, and raptors. Historically, this site was probably grazed by antelope as well. The soils of this site are poorly suited for desert tortoise as the sandy horizons have reduced burrow stability.

This site is suitable for limited winter and spring grazing by sheep and also cattle where water is available. In favorable years, annual forbs and grasses provide additional forage.

General guide to initial stocking rate. Before making specific recommendations, an on-site evaluation must be made.

Pounds/acre
airdry AUM/AC AC/AUM

Normal Years 600

Hydrological functions

Runoff is negligible to low. Hydrologic soil group B - soils having moderate infiltration rates when thoroughly wetted and consisting chiefly of moderately deep to deep, moderately well drained to well-drained soils with moderately fine to moderately coarse textures. These soils have a moderate rate of water transmission. Hydrologic conditions: good - >70% ground cover; fair - 30 to 70% ground cover; poor - <30% ground cover.

Soil Series: Challenger

Hydrologic Group: B

Hydrologic Conditions and Runoff Curves:

Good 68; Fair 72; Poor 77

Soil Series: DeStazo

Hydrologic Group: B

Hydrologic Conditions and Runoff Curves:

Good 68; Fair 72; Poor 77

Recreational uses

This site has value for open space and is used by mountain bikers and other off-road enthusiasts. Flowering wildflowers may also attract visitors during the spring. Off-road vehicle use can easily damage the soil structure and vegetative cover, causing increased soil blowing.

Other information

Military Operations - Clearing or any other disturbance that destroys the soil structure and vegetation can result in increased soil blowing and barren areas. Vehicles should be restricted to existing roads and trails. Native species indigenous to this site are recommended for any revegetation efforts.

Inventory data references

Sampling technique

9 NV-ECS-1

1 SCS-Range 417

___ Other

Type locality

Location 1: Kern County, CA	
Township/Range/Section	T9N R10W S24
General legal description	SW 1/4 Section 24, T9N, R10W Southwest edge of Rogers Lake, Kern Co., CA

Contributors

P. Novak-Echenique

Approval

Kendra Moseley, 10/21/2024

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	05/12/2025
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:**
-