USDA Natural Resources Conservation Service

Ecological site R030XD132CA
Saline Flat

Last updated: 2/25/2025
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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.

MLRA notes

Major Land Resource Area (MLRA): 030X–Mojave Basin and Range

The Mojave Desert Major Land Resource Area (MLRA 30) is found in southern California, southern Nevada, the extreme southwest corner of Utah and northwestern Arizona within the Basin and Range Province of the Intermontane Plateaus. The Mojave Desert is a transitional area between hot deserts and cold deserts where close proximity of these desert types exert enough influence on each other to distinguish these desert types from the hot and cold deserts beyond the Mojave. Kottek et. al 2006 defines hot deserts as areas where mean annual air temperatures are above 64 F (18 C) and cold deserts as areas where mean annual air temperatures are below 64 F (18 C). Steep elevation gradients within the Mojave create islands of low elevation hot desert areas surrounded by islands of high elevation cold desert areas.

The Mojave Desert receives less than 10 inches of mean annual precipitation. Mojave Desert low elevation areas are often hyper-arid while high elevation cold deserts are often semi-arid with the majority of the Mojave being an arid climate. Hyper-arid areas receive less than 4 inches of mean annual precipitation and semi-arid areas receive more than 8 inches of precipitation (Salem 1989). The western Mojave receives very little precipitation during the summer months while the eastern Mojave experiences some summer monsoonal activity.

In summary, the Mojave is a land of extremes. Elevation gradients contribute to extremely hot and dry summers and cold moist winters where temperature highs and lows can fluctuate greatly between day and night, from day to day and from winter to summer. Precipitation falls more consistently at higher elevations while lower elevations can experience long intervals without any precipitation. Lower elevations also experience a low frequency of precipitation events so that the majority of annual precipitation may come in only a couple precipitation events during the whole year. Hot desert areas influence cold desert areas by increasing the extreme highs and shortening the length of below freezing events. Cold desert areas influence hot desert areas by increasing the extreme lows and increasing the length of below freezing events. Average precipitation and temperature values contribute little understanding to the extremes which govern wildland plant communities across the Mojave.

Hyper-Arid Mojave Land Resource Unit (XD)

LRU notes

The Mojave Desert is currently divided into 4 Land Resource Units (LRUs). This ecological site is within the Arid Eastern Mojave LRU where precipitation is bi-modal, occurring during the winter months and summer months. The Arid Eastern Mojave LRU is designated by the 'XB' symbol within the ecological site ID. This LRU is found across the eastern half of California, much of the mid-elevations of Nevada, the southernmost portions of western Utah, and the mid-elevations of northwestern Arizona. This LRU is essentially equivalent to the Eastern Mojave Basins and Eastern Mojave Low Ranges and Arid Footslopes of EPA Level IV Ecoregions

Elevations range from 1650 to 4000 feet and precipitation is between 4 to 8 inches per year. This LRU is

distinguished from the Arid Western Mojave (XA) by the summer precipitation, falling between July and September, which tends to support more warm season plant species. The 'XB' LRU is generally east of the Mojave River and the 117 W meridian (Hereford et. al 2004). Vegetation includes creosote bush, burrobush, Nevada jointfir, ratany, Mojave yucca, Joshua tree, cacti, big galleta grass and several other warm season grasses. At the upper portions of the LRU, plant production and diversity are greater and blackbrush is a common dominant shrub.

Ecological site concept

This ecological site is found within the playa landscape on landforms such as a flood-plain playa or alluvial flat where moisture accumulation, through flooding, ponding or subsurface flow, contribute to the development or maintenance of a gypsic or salic horizon. This site is found on playas or portions of playas receiving water from larger watersheds, usually greater than 100,000 acres. Ephemeral streams terminating at this ecological site are typically stream order 3 or larger.

This site is part of provisional concept R030XY129CA.

Similar sites

R030XY127CA	**Sodic Dune 3-5" P.Z.** Sodic Dunes 3-5

Table 1. Dominant plant species

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

Physiographic features

Table 2. Representative physiographic features

Landforms	(1) Basin floor > Alluvial flat (2) Basin floor > Flood-plain playa
Elevation	590–655 ft
Slope	4–15%
Aspect	Aspect is not a significant factor

Climatic features

Table 3. Representative climatic features

Frost-free period (average)	360 days
Freeze-free period (average)	
Precipitation total (average)	4 in

Influencing water features

This site is associated with a playa and may be intermittently flooded.

Soil features

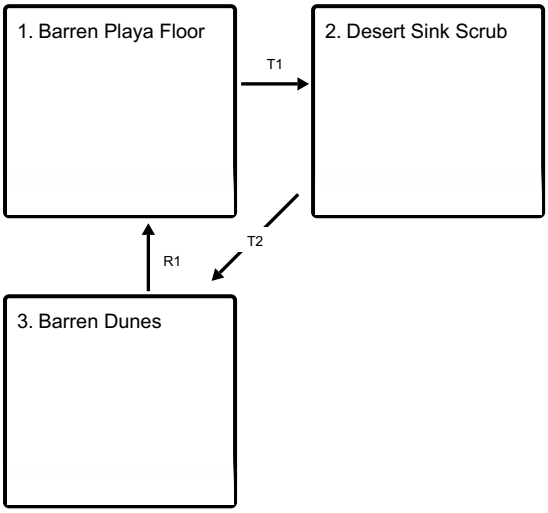
Table 4. Representative soil features

Parent material	(1) Lacustrine deposits (2) Eolian deposits
Surface texture	(1) Very fine sandy loam
Drainage class	Well drained
Soil depth	60 in
Surface fragment cover <=3"	0–15%

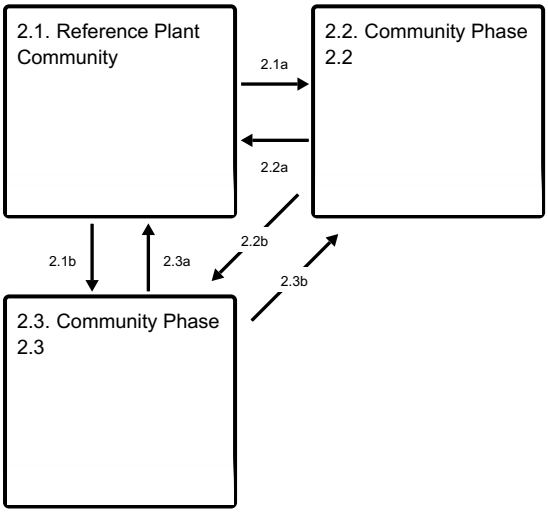
Ecological dynamics

State and transition model

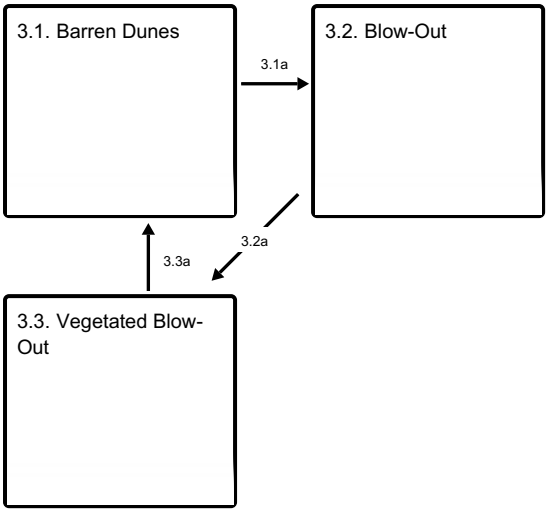
Ecosystem states



State 2 submodel, plant communities



State 3 submodel, plant communities



State 1
Barren Playa Floor

Playa surface conditions such as salinity, crusts, and smoothness prevent seed retention, germination and seedling establishment. Until these conditions are altered through surface cracking, erosion and deposition; very little vegetation is able to grow, survive and thrive.

State 2
Desert Sink Scrub

The interpretative plant community is the historic climax plant community. This site occurs adjacent to dry lake beds and is characterized by a low open shrubland dominated by alkali-tolerant chenopods, especially *Suaeda moquinii*. Perennial grasses and forbs are sparse. Annuals are sparse and seasonally present. This site is stable in this condition. Vegetative composition is about 90% shrubs, 5% grasses and 5% forbs. Approximate ground cover (basal and crown) is 2 to 10 percent.

Community 2.1
Reference Plant Community

The representative natural plant community is Desert Sink Scrub or Iodinebush Series. Iodinebush and Mojave seablite dominate this community. Potential vegetative composition is about 5% grasses, 5% forbs, and 90% shrubs. 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 2% of each species of this group and no more than 10% in aggregate

Forest understory. Allow no more than 2% of each species of the grasses group and no more than 5% in aggregate.

Allow no more than 2% of each species of the forbs group and no more than 5% in aggregate.

Table 5. Annual production by plant type

Plant Type	Low (Lb/Acre)	Representative Value (Lb/Acre)	High (Lb/Acre)
Shrub/Vine	46	90	136
Forb	2	5	7
Grass/Grasslike	2	5	7
Total	**50**	**100**	**150**

Table 6. Ground cover

Tree foliar cover	0%
Shrub/vine/liana foliar cover	2-9%
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%

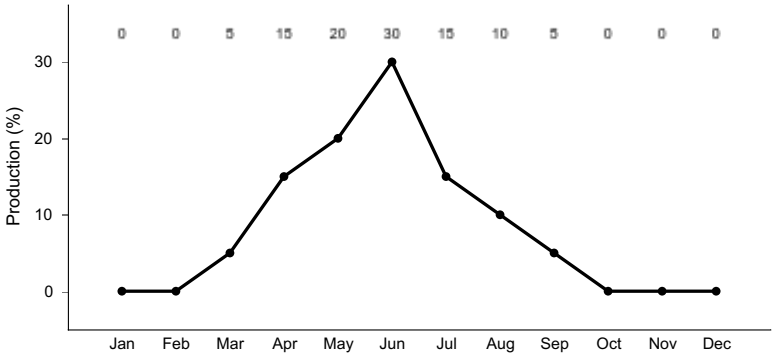


Figure 2. Plant community growth curve (percent production by month). CA3010, Mojave Seablite. Growth begins in early spring; flowering occurs from July to September..

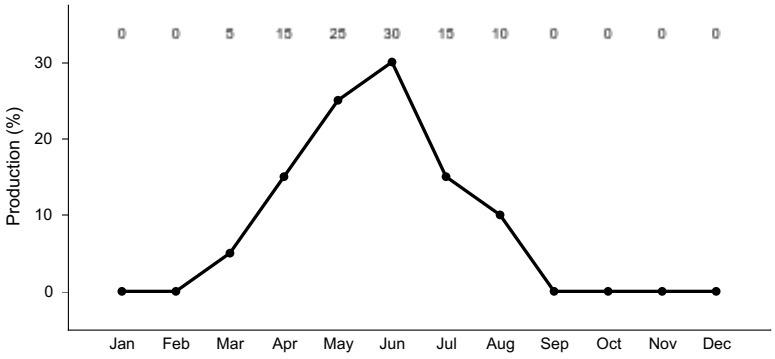


Figure 3. Plant community growth curve (percent production by month). CA3029, Iodine bush. Growth begins in early spring and continues through the summer, setting seed by late summer..

Community 2.2
Community Phase 2.2

Community Phase 2.2 is an at risk community phase. Reduced vegetation cover exposes loose sandy surfaces to wind and water erosion. Wind erosion rates can increase exponentially as vegetation and biological crust cover is lost (Belnap 2003, Li et al. 2005).

Community 2.3
Community Phase 2.3

Perennial vegetation is decreasing and being buried. Annual dune species are seasonally abundant in the inter-shrub spaces.

Pathway 2.1a
Community 2.1 to 2.2

Drought or altered hydrology lead to branch pruning and die off.

Pathway 2.1b
Community 2.1 to 2.3

Upstream or upwind disturbance leads to large sediment deposition at this site.

Pathway 2.2a
Community 2.2 to 2.1

A year with above average precipitation enables plants to thrive.

Pathway 2.2b
Community 2.2 to 2.3

Continued drought or altered hydrology, especially upstream or upwind of this site causes sediment accumulation rates much greater than sediment removal rates.

Pathway 2.3a
Community 2.3 to 2.1

Above average precipitation allows upstream or upwind perennial vegetation to rebound and reduces sediment deposition at this site.

Pathway 2.3b
Community 2.3 to 2.2

Drought or altered hydrology lead to branch pruning and die off.

State 3
Barren Dunes

Vegetation traps moving sediment and accumulation occurs beneath the vegetation. Changes in hydrology, climate and other types of upstream or upwind disturbances may accelerate sediment accumulation to the point of vegetation burial (Laity 2003). Accumulation could also be slow enough to allow some of the existing vegetation to survive while species typical of drier sites begin to establish on the semi-stable dunes.

Community 3.1
Barren Dunes

Sediment deposition rates have exceeded removal rates. Deposition has buried all perennial vegetation.

Community 3.2
Blow-Out

Loose sediment has been removed usually to a more stable surface which initially is barren.

Community 3.3
Vegetated Blow-Out

The blow-out area, may also be known as a playette landform, begins to host annual species and pioneering perennial species. Annual species create a microsite for perennial species establishment.

Pathway 3.1a
Community 3.1 to 3.2

Droughty conditions and high winds lead to a dune blowout where a stable surface is exposed.

Pathway 3.2a
Community 3.2 to 3.3

Annual species become seasonally abundant, creating microsites for perennial species establishment.

Pathway 3.3a
Community 3.3 to 3.1

Drought years with below average precipitation or altered hydrology lead to barren dunes.

Transition T1
State 1 to 2

Surface disturbance such as cracking, rill formation, tire tracks and sediment deposition provide a site for seed retention, germination and seedling establishment.

Transition T2
State 2 to 3

Altered hydrology, drought or any other type of upstream or upwind activities which removes vegetation and allows sediment migration to this site.

Restoration pathway R1
State 3 to 1

Restored hydrology or following years with above average precipitation, dunes and inter-dune areas are stabilized by a robust vegetation community.

Additional community tables

Animal community

This site has low species diversity. Small mammals that may occur include round-tailed ground squirrels and Merriam's kangaroo rats. Coyotes and black-tailed jackrabbits may also occur.

Lizards common to this site include western whiptails and zebra-tailed lizards.

Birds occurring on this site include horned larks, black-throated sparrows, loggerhead shrikes and common ravens.

Season of Use- Other Mgt. Considerations: This site has limited value for livestock grazing due to very low productivity and lack of stock water. Iodinebush and Mojave seablite are considered poor forage for livestock.

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

Pounds/acre
air dry AUM/AC AC/AUM
Normal Years 100

Hydrological functions

Runoff is medium. 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. Hydrologic conditions: good - >70% ground cover (includes litter, grass and brush overstory); fair - 30 to 70% ground cover; poor <30% ground cover.

Soil Series: Gypboy
Hydrologic Group: B
Hydrologic Conditions and Runoff Curves:
Good 68; Fair 72; Poor 77

Recreational uses

This site is highly valued for open space and those interested in desert ecology.

Other information

Military Operations - Management for this site would be to protect it from excessive disturbance and maintain existing plant cover. Land clearing or other disturbances that destroy the vegetation can result in soil compaction reduced infiltration rates, accelerated erosion, soil blowing, barren areas and the introduction of non-native plants.

Inventory data references

Sampling technique
_1_ NV-ECS-1
___ SCS-Range 417
_1_ Other

Type locality

Location 1: San Bernardino County, CA	
Township/Range/Section	T5N R11E S6
UTM zone	N
UTM northing	3822869
UTM easting	603339
General legal description	SW1/4 Sec. 6, T5N R11E Approximately 5 miles southwest of Amboy, CA Amboy Crater Quadrangle UTM 11S 0603339e 3822869n (Datum=NAS-C) San Bernardino Co., CA

Other references

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Contributors

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Approval

Sarah Quistberg, 2/25/2025

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	05/11/2025
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:**