

# Ecological site R030XB150CA Sandhill 3-5" P.Z.

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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.

### **Ecological site concept**

This site occurs on thick sand sheets. Elevations are 1830 to 3260 feet. Slopes typically range from 2 to 8%, but can be as great as 15%. The soils associated with this site are very deep, sandy soils. They formed from eolian deposits from mixed sources.

Please refer to group concept R030XB148CA to view the provisional STM.

### **Associated sites**

R030XB137CA	Granitic Loam	
	Granitic Loam 3-5 P.Z.	

#### **Similar sites**

R030XB137CA	<b>Granitic Loam</b> Granitic Loam 3-5
R030XB134CA	Cobbly Claypan 5-7" P.Z. Cobbly Claypan 5-7

#### Table 1. Dominant plant species

Tree	Not specified	
Shrub	(1) Larrea tridentata	
Herbaceous	(1) Pleuraphis rigida	

### **Physiographic features**

This site occurs on thick sand sheets. Elevations are 1830 to 3260 feet. Slopes typically range from 2 to 8%, but can be as great as 15%.

 Table 2. Representative physiographic features

Landforms	(1) Sand sheet	
Elevation	1,300–3,025 ft	
Slope	2–15%	
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 at Pahrump, NV.

#### 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**

The soils associated with this site are very deep, sandy soils. They formed from eolian deposits from mixed

sources. Available water holding capacity is very low and permeability is rapid and they are somewhat excessively drained. Soils classify as mixed thermic (or hyperthermic) Typic Torripsamments.

The soils on this site are not stable and are constantly in a state of flux due to wind deposition from nearby playas and lake plains. Wind erosion hazard is severe for areas between shrubs.

This ecological site is found in the following Map units and soil components:

SSA Map unit Component

697 115 Rositas
697 126 Rositas
697 140 Rositas
697 170 Rositas
697 170 Typic Torripsamments
697 200 Livefire
697 251 Livefire
697 400 Rositas
697 551 Rositas

805 760 Hypoint 805 760 Bluepoint

#### Table 4. Representative soil features

Surface texture	(1) Sand (2) Loamy sand (3) Loamy fine sand
Family particle size	(1) Sandy
Drainage class	Somewhat excessively drained
Permeability class	Moderate to rapid
Soil depth	80 in
Surface fragment cover <=3"	1–5%
Surface fragment cover >3"	0–2%
Available water capacity (0-40in)	2.4–2.8 in
Electrical conductivity (0-40in)	0–8 mmhos/cm

Sodium adsorption ratio (0-40in)	0–60
Soil reaction (1:1 water) (0-40in)	7.4–8.8
Subsurface fragment volume <=3" (Depth not specified)	0–35%
Subsurface fragment volume >3" (Depth not specified)	0–10%

## **Ecological dynamics**

Please refer to group concept R030XB148CA to view the provisional STM.

Ecological dynamics: Surface disturbance may reduce plant cover, density, and diversity of this site. These changes can be very subtle or extremely obvious depending on the intensity of use, rate of use and an assortment of environmental factors (topography, rainfall, soil type). As ecological condition deteriorates big galleta and other perennial grasses decrease. Short-lived perennials such as bush encelia, rayless goldenhead, California croton and wirelettuce will initially increase. Continued surface disturbance may reduce the cover of the short-lived perennials as well as the long-lived perennials such as creosotebush, range ratany and California ephedra. White bursage, a long-lived opportunistic species may initially increase. With a loss of perennial cover, non-native annual grasses and forbs such as schismus, red-stem filaree and Russian thistle will readily invade this site. White burrobush and wirelettuce are the primary perennial pioneer species.

Desert communities are usually unaffected by fire because of low fuel loads, although a year of exceptionally heavy winter rains can generate fuels by producing a heavy stand of annual forbs and grasses. If non-native annual forbs and grasses are present, the intensity and frequency of fires will increase significantly. When fires do occur, the effect on the ecosystem may be extreme due to the harsh environment and the slow rate of recovery. Fire damage to big galleta varies; depending on whether plants are dormant when burned. If plants are dry, damage may be severe because the live center may be burned out. Big galleta may resprout from rhizomes. Indian ricegrass sustains slight damage by fire and can reestablish via seed dispersed from adjacent unburned areas. White bursage and creosotebush possess limited sprouting ability, thus, can be killed by fire. White bursage, however, can rapidly re-establish from seed.

## State and transition model

#### Ecosystem states



State 1 submodel, plant communities



State 1 Reference State- Plant Community 1.1

Community 1.1 Reference State- Plant Community 1.1 The representative natural plant community is Mojave Creosotebush Scrub or Big Galleta Series. Creosotebush and big galleta dominate this community. Potential vegetative composition is about 60% grasses, 15% forbs, and 25% shrubs. Mojave Creosotebush Scrub or Big Galleta Series - The historic site potential is characterized by an open two-tiered canopy less than 2 meters tall with creosotebush in the upper tier over the lower one of white bursage and big galleta. A spectacular display of annual forbs occurs during years of above-average precipitation. This site is stable in this condition. 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 the shrub group and no more than 10% in aggregate\*\*

\*\*Other shrubs comprise 5-10% composition (air-dry weight)\*\*

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

\*\*Other grasses (both perennial and annual)comprise 5-10% composition (air-dry weight)\*\*

\*\*Allow no more than 2% of each species of the forb group and no more than 8% in aggregate\*\*

\*\*Other perennial forbs comprise 2-8% composition (air-dry weight)\*\*

\*\*Other annual forbs comprise 0-20% composition (air-dry weight)\*\*

#### Table 5. Annual production by plant type

Plant Type	Low (Lb/Acre)	Representative Value (Lb/Acre)	High (Lb/Acre)
Grass/Grasslike	270	420	600
Shrub/Vine	112	175	250
Forb	68	105	150
Total	450	700	1000

#### Table 6. Ground cover

Tree foliar cover	3-5%
Shrub/vine/liana foliar cover	3-5%
Grass/grasslike foliar cover	6-12%
Forb foliar cover	2-3%
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 3. Plant community growth curve (percent production by month). CA3004, Burrobush XB. Growth starts in early spring, flowering and seed set occur by July. Dormancy occurs during the hot summer months. With sufficient summer/fall precipitation, some vegetation may break dormancy and produce a flush of new growth..



Figure 4. Plant community growth curve (percent production by month). CA3015, Creosote bush XB. Growth starts in early spring with flowering and seed set occurring by July. Dormancy occurs during the hot summer months. With sufficient summer/fall precipitation, some vegetation may break dormancy and produce a flush of growth..



Figure 5. Plant community growth curve (percent production by month). CA3022, Indian ricegrass. Growth begins in late winter, flowering and fruiting finished by the hot summer months. Early fall rains can trigger a flush of new growth.



Figure 6. Plant community growth curve (percent production by month). CA3024, Big galleta. Some green up in spring; dormant May and June; most

## Additional community tables

### **Animal community**

WILDLIFE COMMUNITIES (Cutler et al 1998):

a. Small mammals occurring on this site include round-tailed ground squirrels, white-tailed antelope squirrels, little pocket mice and desert kangaroo rats. Black-tailed jackrabbits, badgers and coyotes may also occur.

b. Reptiles common to this site include lizards such as Mojave fringe-toed lizards, side-blotched lizards, long-tailed brush lizards and western whiptails. This site also provides habitat for several species of snakes including western shovel-nosed snakes, sidewinders and glossy snakes. The sandy subsurface soil textures may be a restrictive feature for burrowing reptiles, such as the desert tortoise.

c. Birds common to this site include common ravens, loggerhead shrikes, horned larks, LeConte's thrashers and several species of sparrows.

#### WILDLIFE HABITAT:

Management for this site would be to protect it from excessive disturbance and maintain existing plant cover. Close roads and trails no longer being used and revegetate using native species indigenous to this site. Vehicle activity off of designated roads and tank trails may destroy small mammal burrows. Removal of weedy species with an appropriate monitoring program is recommended. Water developments would increase the species diversity of this site.

#### LIVESTOCK GRAZING:

a. Season of Use- Other Mgt. Considerations: Big galleta and Indian ricegrass are highly palatable to cattle and horses. White bursage is fair browse for cattle and horses, and fair to good browse for goats. Sheep also use this shrub, feeding primarily on new growth and seeds. Creosotebush is unpalatable to livestock. Domestic sheep use this shrub for shade. During favorable years, annual forbs and grasses provide abundant forage.

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

## Hydrological functions

#### WATERSHED:

Runoff is negligible to very low. Hydrologic soil group A - soils having high infiltration rates even when thoroughly wetted and consisting chiefly of deep, well drained to excessively drained sands or gravels. Hydrologic conditions: good - >70% ground cover (includes litter, grass and brush overstory); fair - 30 to 70% ground cover; poor <30% ground cover.

Soil Series: Bluepoint Hydrologic Group:A Hydrologic Conditions and Runoff Curves: Good- 49 Fair-55 Poor- 63

## **Recreational uses**

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

may also attract visitors during the spring.

## **Other information**

**REVEGETATION OF DISTURBED AREAS:** 

Species indigenous to this site are recommended for any revegetation efforts.

White bursage is valuable for erosion control and cover restoration. Big galleta has moderate potential for erosion control and long-term revegetation and low potential for short-term revegetation projects. Big galleta is somewhat effective at holding blowing sand because of its isolated, clumped growth form. Creosotebush may also be used to rehabilitate disturbed sites. Once established, creosotebush may improve sites for annual forbs and grasses.

Transplanting seedlings is more effective than direct seeding. Planting in late fall or early spring allows for acclimation to summer conditions. Transplants that are dormant during the hot, dry season are best maintained that way rather than attempting to force them to break dormancy and undergo new vegetative growth out of season. Supplemental irrigation is recommended for the first growing season, especially if winter rainfall has been sparse. Protection from rodents is also recommended.

A good stand of Indian ricegrass is also effective in controlling wind erosion. Drilling Indian ricegrass seed in late fall at a depth of 2.5cm is recommended. Deep planting the seed provides favorable moisture relations in the seedbed, protection from wind deflation and protection from granivores.

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 and soil structure can result in soil compaction reduced infiltration rates, accelerated erosion, severe soil blowing and barren areas.

### Inventory data references

This ecological site description is based on the following documentation:

Sampling technique

\_4\_ NV-ECS-1 \_1\_ SCS-Range 417 \_4\_ Other

## **Type locality**

Location 1: San Bernardino County, CA		
Township/Range/Section	T3N R8E S3	
UTM zone	Ν	
UTM northing	3803367	
UTM easting	579844	
General legal description	SE1/4 Sec. 3, T3N R8E Approximately three miles north of Deadman Lake Deadman Lake SW Quadrangle UTM 11S 0579844e 3803367n (Datum=NAS-C) San Bernardino Co., CA	

## Other references

Cutler, P.L., P.R. Krausman, and D.J. Griffin. 1998. Draft Report: Wildlife inventory of the Marine Corps Air Ground Combat Center, Twentynine Palms, California. The University of Arizona, Tucson. U.S. Dept. of Defense Contract N68711-96-LT-60025.

## 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	05/12/2025
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 annualproduction):
- 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: