

## Ecological site R030XB122CA Calcareous Loam 3-5" P.Z.

Last updated: 2/26/2025  
Accessed: 05/11/2025

### 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 summits of erosional fan remnants. Elevations are 2000 to 3500 feet. Slopes range from 2 to 8 percent. The soils that characterize this site are well drained and shallow to very shallow to a duripan. They are formed in mixed alluvium. Surface textures are extremely gravelly sandy loams.

Please refer to group concept R030XB038NV to view the provisional STM.

### Similar sites

R030XB124CA	<b>Gravelly Loam 3-5" P.Z.</b> Gravelly Loam 3-5
R030XB121CA	<b>Calcareous Hill 5-7" P.Z.</b> Calcareous Hill 5-7
R030XB141CA	<b>Loamy 5-7" P.Z.</b> Loamy 5-7

Table 1. Dominant plant species

Tree	Not specified
Shrub	(1) <i>Atriplex confertifolia</i> (2) <i>Ambrosia dumosa</i>
Herbaceous	(1) <i>Achnatherum speciosum</i>

### Physiographic features

This site occurs on summits of erosional fan remnants. Elevations are 2000 to 3500 feet. Slopes range from 2 to 8 percent.

Table 2. Representative physiographic features

Landforms	(1) Fan remnant
Elevation	2,000–3,500 ft
Slope	2–8%
Aspect	Aspect is not a significant factor

### Climatic features

The climate on this site is arid characterized by warm, moist winters (30 to 60 degrees F) and hot, dry summers (70 to 100 degrees F). The average annual precipitation ranges from 3 to 5 inches with most falling as rain from

November to March. Approximately 25% of the annual precipitation occurs from July to September as a result of summer convection storms. Mean annual air temperature is 64 to 70 degrees F.

The average frost-free period is 240 to 300 days.

Table 3. Representative climatic features

Frost-free period (average)	300 days
Freeze-free period (average)	
Precipitation total (average)	

Influencing water features

Soil features

The soils that characterize this site are well drained and shallow to very shallow to a duripan. They are formed in mixed alluvium. Surface textures are extremely gravelly sandy loams. Subsurface textures are very gravelly loams, gravelly sandy loams and gravelly sands. Available water capacity is very low and permeability is moderately rapid. Wind erosion hazard is negligible due to surface coarse fragments. Crosgrain has an indurated duripan from 11 to 24 inches which may impede root growth. Owlshead has a moderately cemented and fractured duripan from 6 to 29 inches which allows root growth in fractures.

Representative\_Soil Map Units  
261 Crosgrain-Fortirwin complex, 2-8% slopes  
280 Crackerjack-Owlshead-Thermopyl complex,  
2-8% slopes  
490 Owlshead extremely gravelly sandy loam,  
2-8% slopes

Ecological dynamics

Please refer to group concept R030XB038NV to view the provisional STM.

Ecological dynamics: Successive years of above-average precipitation may result in considerable die-off of many species of native shrubs, especially shadscale. Defoliation and death of branches of creosotebush may occur as a result of long periods of intense moisture stress. Opportunistic perennials such as white bursage, wirelettuce and desert trumpet will initially increase. Destructive impacts such as land clearing can reduce the opportunistic perennials and also long-lived creosotebush. With a loss of perennial cover, non-native annual grasses and forbs such as red brome, schismus, Russian thistle and red-stem filaree will readily invade this site. White burrobush is the primary perennial pioneer species on this site.

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 result in destruction of desert tortoise and small mammal burrows. Water developments would increase the species diversity of this site.

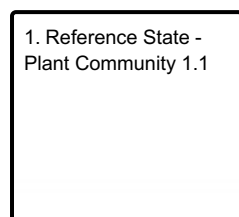
Revegetation of Disturbed Areas - Species indigenous to this site are recommended for any revegetation efforts. Shadscale, white bursage and creosotebush are effective shrubs for revegetation of disturbed sites. Transplanting seedlings is more effective than direct seeding. Planting in late fall or early 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.

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. When fires do occur, the

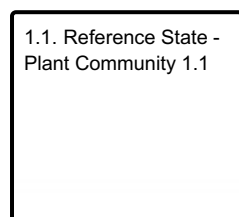
effect on the ecosystem may be extreme due to the harsh environment and the slow rate of recovery. Saltbush species, such as shadscale, are generally resistant to fire because of a low volatilization rate. White bursage and creosotebush possess limited sprouting ability, thus, can be killed by fire. 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 historic site potential is characterized by low, intricately branched, often spiny shrubs, 0.3 to 0.6 meters tall, with a continuous, intermittent or open canopy dominated by *Atriplex confertifolia*. Perennial grasses and forbs are common. Annuals are seasonally present. The composition of the annual vegetation differs from year to year, depending on the time and amount of rainfall. This site is stable in this condition. The representative natural plant community is Shadscale Scrub or Shadscale Series. This community is dominated by shadscale, white bursage and desert needlegrass. Potential vegetative composition is about 10% grasses, 10% forbs, and 80% 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 3% of each species of the shrub group and no more than 15% aggregate\*\*

\*\*Other shrubs comprise 5 to 15% Composition (air-dry weight)\*\*

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

\*\*Other perennial grasses comprise 2 to 8% Composition (air-dry weight)\*\*

\*\*Other annual grasses comprise Trace to 5% Composition (air-dry weight)\*\*

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

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

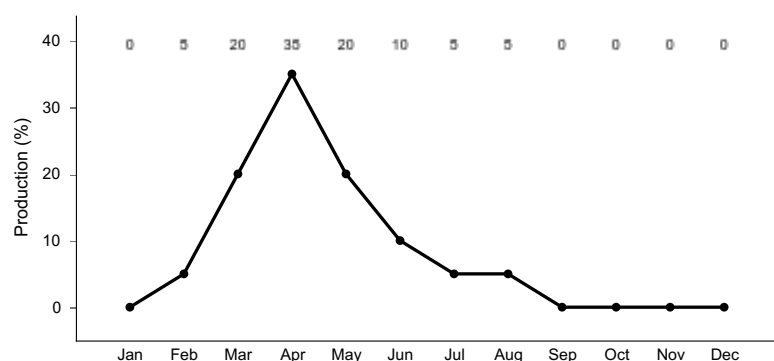
\*\*Other annual forbs comprise trace to 10% Composition (air-dry weight)\*\*

**Table 4. Annual production by plant type**

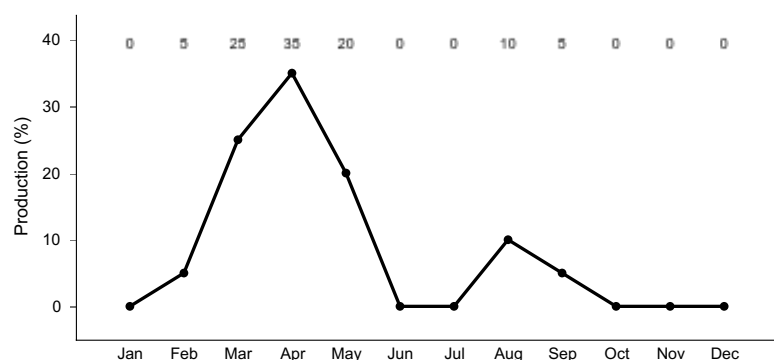
Plant Type	Low (Lb/Acre)	Representative Value (Lb/Acre)	High (Lb/Acre)
Shrub/Vine	80	160	280
Forb	10	20	35
Grass/Grasslike	10	20	35
<b>Total</b>	<b>100</b>	<b>200</b>	<b>350</b>

**Table 5. Ground cover**

Tree foliar cover	0%
Shrub/vine/liana foliar cover	4-12%
Grass/grasslike foliar cover	1-2%
Forb foliar cover	1-2%
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). 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). CA3087, Desert needlegrass. Growth begins in mid-winter and continues through summer, setting seed in late summer..**

## Additional community tables

### Animal community

This site provides suitable habitat for mammals such as antelope ground squirrels; pocket mice; Merriam's and Great Basin kangaroo rats; and black-tailed jackrabbits, coyotes and feral burros. Shadscale seeds are used by several species of small mammals. The twigs and foliage provide forage for jackrabbits and some small mammals.

This site provides habitat for lizards such as the western whiptail, side-blotched lizard, chuckwalla and desert horned lizard. The duripan is a limiting factor for burrowing reptiles such as desert tortoise.

Birds common to this site include common ravens, black-throated and sage sparrows, and rock wrens.

Shadscale is considered valuable browse for cattle and sheep. Shadscale is often eaten during the early spring before spines mature. The seeds are also readily eaten by livestock. 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. White bursage is one of the major forage species of feral burros, especially in winter. Feral burros can eliminate this shrub through browsing and trampling. Creosotebush is unpalatable to livestock. Domestic sheep use creosotebush primarily for shade. During favorable years, perennial and annual forbs and grasses provide additional forage on this site.

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

Pounds/acre  
air dry  
Normal Years 200

### Hydrological functions

Runoff is low. Hydrologic group C - soils having slow infiltration rates when thoroughly wetted and consisting chiefly of soils with a layer that impedes downward movement of water, or soils with moderately fine to fine texture. Hydrologic conditions: good - >70% ground cover (includes litter, grass and brush overstory); fair - 30 to 70% ground cover; poor <30% ground cover.

Soil Series: Crosgrain  
Hydrologic Group: C  
Hydrologic Conditions and Runoff Curves: Good-79; Fair-81; Poor-85

Soil Series: Owlshead  
Hydrologic Group: C  
Hydrologic Conditions and Runoff Curves: Good-79; Fair-81; Poor-85

## 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

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 the soil crust and structure can result in soil compaction, reduced infiltration rates, accelerated erosion, soil blowing and barren areas. The frequency of flash flooding may also increase with increased surface runoff and loss of vegetative cover. Rest or protect sites from further disturbance. Gully stabilization methods include straw bale checkdams, rock riprap, and sand bags.

## Inventory data references

This ecological site description is based on the following documentation:

Sampling technique

\_5\_ NV-ECS-1  
\_\_\_\_ SCS-Range 417  
\_6\_ Other

## Type locality

Location 1: San Bernardino County, CA	
Township/Range/Section	T14N R3E S7
UTM zone	N
UTM northing	3908510
UTM easting	529397
General legal description	SW1/4 Sec. 7, T14N R3E; Approximately 4 miles north of Fort Irwin Fort Irwin Quadrangle UTM 11S 0529397e 3908510n (Datum=NAS-C) San Bernardino Co., CA

## Other references

Brown, T.K. and K. A. Nagy with R.D. Nieuhaus, Inc. 1995. Final Report, Herpetological Surveys and Physiological Studies on the Western Portion of Fort Irwin NTC.

Brydolf, B. with R.D. Nieuhaus, Inc. 1996. Final Report, 1994 Avian Survey at the National Training Center, Fort Irwin, CA.

Recht, M.A. with R.D. Nieuhaus, Inc. 1995. Final Report, 1994 Small Mammal Surveys of Selected Sites at the National Training Center Fort Irwin, California.

## Contributors

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## Approval

Sarah Quistberg, 2/26/2025

## 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:**

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2. **Presence of water flow patterns:**

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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:**

- 
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:

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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):**
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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:**
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17. **Perennial plant reproductive capability:**
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