Ecological site R030XB142CA
Sandy 5-7" P.Z.

Last updated: 2/26/2025
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 fan piedmonts. Elevations are 3000 to 3200 feet. Slopes range from 2 to 4 percent.

The soils that characterize this site are very deep and somewhat excessively drained. They are formed in mixed alluvium. Surface textures are very gravelly loamy sands.

Associated sites

R030XB141CA	**Loamy 5-7" P.Z.** Loamy 5-7

Similar sites

R030XY133CA	**Sodic Sand 3-5" P.Z.** Sodic Sand 3-5
R030XY127CA	**Sodic Dune 3-5" P.Z.** Sodic Dunes 3-5

Table 1. Dominant plant species

Tree	Not specified
Shrub	(1) *Atriplex canescens*
Herbaceous	(1) *Achnatherum hymenoides*

Physiographic features

This site occurs on fan piedmonts. Elevations are 3000 to 3200 feet. Slopes range from 2 to 4 percent.

Table 2. Representative physiographic features

Landforms	(1) Fan piedmont
Elevation	914–975 m
Slope	2–4%
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 4 to 7 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 61 to 66 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)	178 mm

Influencing water features

Soil features

The soils that characterize this site are very deep and somewhat excessively drained. They are formed in mixed alluvium. Surface textures are very gravelly loamy sands. Subsurface textures are sandy loams and very gravelly fine sands. Available water capacity is low and permeability is moderately rapid. Wind erosion hazard is moderate. Effective rooting depth is 60 inches or more. Water tables are greater than 60 inches.

Representative Soil Map Units
252 Livefire complex, 2-4% slopes

Ecological dynamics

Please refer to group concept R030XA022CA to view general STM.

The historic site potential is characterized by an open stand of shrubs dominated by *Atriplex canescens*. Perennial grasses and forbs are common. Annual grasses and forbs are seasonally present. This site is stable in this condition.

As ecological condition deteriorates fourwing saltbush, winterfat and the perennial grasses will decrease. Non-native species likely to invade this site include red brome, schismus, red-stem filaree and Russian thistle. White burrobush is the primary perennial pioneer species.

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

Species indigenous to this site are recommended for any revegetation efforts.
Fourwing saltbush has been widely used for rehabilitating sites in southern and northern desert shrublands. Seed may be broadcast or drill-seeded, but broadcasting often produces better results. Seeding success is somewhat sporadic. Seedlings, which tend to be more drought tolerant and less susceptible to predation, may be transplanted. Seedlings are generally transplanted during the early spring, since three weeks or more of good soil moisture are required for establishment. Supplemental irrigation is recommended for the first growing season, especially if winter rainfall has been sparse. Summer annuals and non-native plants should be removed from around the transplanted shrubs to reduce competition for water. 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 2.5 cm is recommended. Deep planting the seed provides favorable moisture relations in the seedbed, protection from wind deflation and protection from granivores.

Fourwing saltbush is reportedly tolerant of fire. It is characterized by a low volatilization rate, which renders the plant somewhat fire-resistant. If burned, fourwing saltbush can resprout from the root crown or underground portions of the stem. This species can also reestablish some sites through an abundance of wind-dispersed seed from

adjacent unburned sites. Winterfat is either killed or top-killed by fire, depending on fire severity. Severe fire can kill the perennating buds located several inches above the ground surface and thus kills the plant. In addition, severe fire usually destroys seeds. Indian ricegrass sustains slight damage by fire and can reestablish via seed dispersed from adjacent unburned areas.

State and transition model

Ecosystem states

1. Reference State - Plant Community 1

State 1 submodel, plant communities

1.1. Reference State - Plant Community 1

State 1
Reference State - Plant Community 1

Community 1.1
Reference State - Plant Community 1

The representative natural plant community is Desert Saltbush Scrub or Fourwing Saltbush Series. This community is dominated by fourwing saltbush and Indian ricegrass. Potential vegetative composition is about 20% grasses, 10% forbs, and 70% 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 this group, and no more than 10% in aggregate

Forest understory. Allow no more than 3% of each species of the grasses group, and no more than 10% in aggregate

Allow no more than 3% of each species of the forbs group, and no more than 10% in aggregate

Table 4. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Shrub/Vine	78	196	353
Grass/Grasslike	22	56	101
Forb	11	28	50
Total	**111**	**280**	**504**

Table 5. Ground cover

Tree foliar cover	0%
Shrub/vine/liana foliar cover	4-11%
Grass/grasslike foliar cover	1-3%

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%

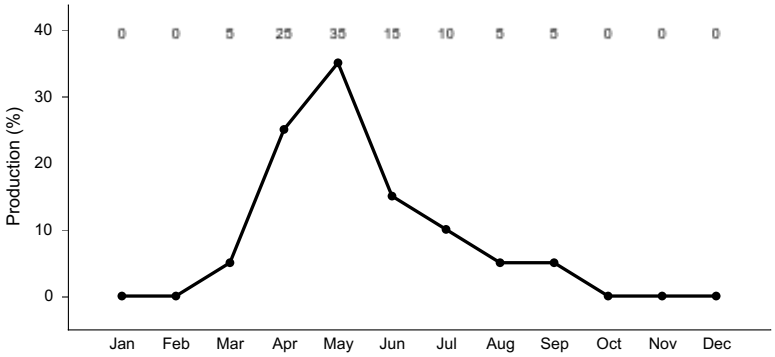

Figure 2. Plant community growth curve (percent production by month). CA3008, Fourwing saltbush. Growth begins in spring to early summer. Flowering occurs from May through September, and fruit ripens from October to December. Seed dispersal occurs from October through April. Seed may remain on the plants from one to two years..

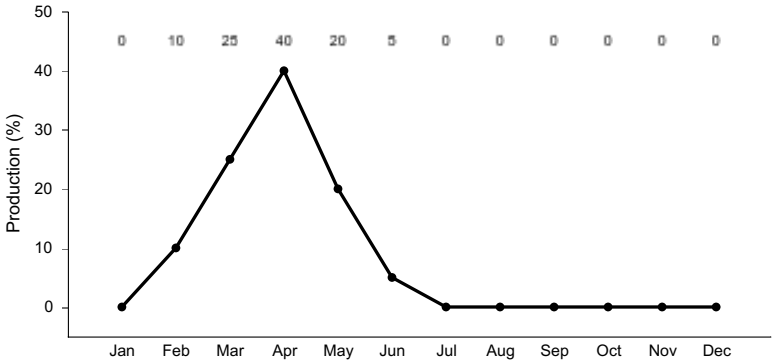

Figure 3. Plant community growth curve (percent production by month). CA3009, Winterfat. Growth starts in late winter. Flowering and seed set occur by June. Seeds remain on the shrubs for several months. Dormancy occurs during the hot summer months..

Additional community tables

Animal community

This site provides habitat for small mammals such as Mojave and antelope ground squirrels; Great Basin, Merriam's and Panamint kangaroo rats; long-tailed and little pocket mice; grasshopper and deer mice; black-tailed jackrabbits and coyotes. Winterfat provides cover for small mammals and forage for black-tailed jackrabbits.

Reptiles occurring on this site include the zebra-tailed lizard, western whiptail, long-nosed leopard lizard, desert horned lizard, and side-blotched lizard. The sandy soil textures are a restrictive feature for burrowing reptiles.

Birds occurring on this site include horned larks, common ravens, Black-throated and sage sparrows, Red-tailed hawks, American kestrels, greater roadrunners, and loggerhead shrikes.

LIVESTOCK GRAZING:
Fourwing saltbush and winterfat are valuable browse for domestic livestock. Fourwing saltbush has fair to good forage value for domestic sheep and goats, and at least fair forage value for cattle. Fourwing saltbush can withstand heavy grazing. During favorable years, annual forbs and grasses provide additional forage. Indian ricegrass produces abundant foliage in spring and early summer. It has good forage value for sheep, cattle and horses.

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 250

Hydrological functions

Runoff is 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: Livefire
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

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.

Inventory data references

Sampling technique

_2_ NV-ECS-1
___ SCS-Range 417
_2_ Other

Type locality

Location 1: San Bernardino County, CA	
Township/Range/Section	T14N R1E S8
UTM zone	N
UTM northing	3909500
UTM easting	509500
General legal description	SE1/4 Sec. 8 T14N R1E Approximately one mile south of Goldstone Lake Goldstone Quadrangle UTM 11S 0509500e 3909500n (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

P. Novak-Echenique

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	05/12/2025
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 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:**
