USDA Natural Resources
Conservation Service

Ecological site R030XB131CA
Moist Granitic Drain

Last updated: 2/26/2025
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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.

Ecological site concept

This site occurs in drainageways of inset fans. Elevations are 1065 to 2900 feet. Slopes range from 0 to 4 percent. The soils that characterize this site are very deep and excessively drained. They are formed in stratified alluvium from mixed sources. Surface textures are very gravelly loamy coarse sands and gravelly coarse sands.

Please refer to group concept R030XB103NV to view the provisional STM.

Associated sites

R030XB136CA	**Dry Wash** Dry Wash
R030XB145CA	**Valley Wash** Valley Wash

Similar sites

R030XB145CA	**Valley Wash** Valley Wash [CHLI2-PSSP3 minor trees;less productive site]
R030XB136CA	**Dry Wash** Dry Wash [CHLI2-PSSP3 absent;less productive site]

Table 1. Dominant plant species

Tree	Not specified
Shrub	(1) *Chilopsis linearis* (2) *Psorothamnus spinosus*
Herbaceous	Not specified

Physiographic features

This site occurs in drainageways of inset fans. Elevations are 1065 to 2900 feet. Slopes range from 0 to 4 percent.

Table 2. Representative physiographic features

Landforms	(1) Drainageway
Flooding duration	Brief (2 to 7 days)
Flooding frequency	Frequent
Elevation	325–884 m

Slope	0–4%
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 2 to 6 inches with most falling as rain from November to March. Approximately 30% to 45% of the annual precipitation occurs from July to September as a result of summer convection storms. Mean annual air temperature is 64 to 73 degrees F.

The average frost-free period is 240 to 360 days.

Table 3. Representative climatic features

Frost-free period (average)	360 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 excessively drained. They are formed in stratified alluvium from mixed sources. Surface textures are very gravelly loamy coarse sands and gravelly coarse sands. Subsurface horizons are stratified lenses of gravelly and extremely gravelly coarse sands and very gravelly and extremely gravelly loamy coarse sands. Available water capacity is very low and permeability is rapid and very rapid. Wind erosion hazard is negligible due to surface rock fragments. Effective rooting depth is 60 inches or more. Water tables are greater than 60 inches. This site is subject to frequent flooding.

Representative_Soil Map Units

272 Arizo association, 0-4% slopes,
frequently flooded
310 Carrizo association, 2-4% slopes,
frequently flooded

Ecological dynamics

Please refer to group concept R030XB103NV to view the provisional STM.

As ecological condition deteriorates white burrobush, desert trumpet, wirelettuce and white bursage will initially increase. Continued surface disturbance may reduce the cover of the short-lived perennials as well as the long-lived perennials such as smoketree and desert willow. Species likely to invade this site include saltcedar and introduced annual grasses and forbs such as schismus, red brome, red-stem filaree and Russian thistle.

Dry washes are known to be zones of high animal activity in the desert. The abundance of insects attracts both birds and mammals to the wash. The occurrence of taller statured shrubs also provide wildlife cover, thus the washes serve as wildlife corridors. 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. Restore channel morphology where impacted. Water developments would also increase the species diversity of this site.

Revegetation of Disturbed Areas - Species indigenous to this site are recommended for any revegetation efforts.

Desert willow and smoketree are effective soil stabilizers and are usually transplanted from nursery stock. White

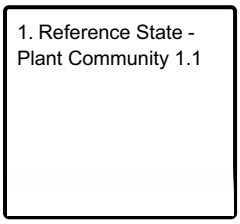
burrobush is a short-lived species, although the seeds have high viability and germination rates compared to other desert shrubs.

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. 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.

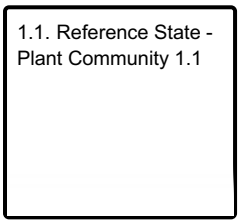
This site is usually unaffected by fire because of low fuel loads, although a year of exceptionally heavy winter rains can generate fuels by producing a heavy stand of annual forbs and grasses. Desert willow is able to sprout from the root crown following top-kill by fire. Smoketree is top-killed by fire and surviving roots may resprout. White burrobush establishes quickly after fire via off-site seeds and sprouting.

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 a shrubby, diverse, open community dominated by *Chilopsis linearis* ssp. arcuata and *Psorothamnus spinosus*. Perennial grasses and forbs are sparse. Annual forbs and grasses are seasonally present and are abundant in years of above average precipitation. This site is inherently unstable due to the occurrence and frequency of flooding. The representative natural plant community is Mojave Desert Wash Scrub or Catclaw Acacia Series. Desertwillow and smoketree dominate this community. Potential vegetative composition is about 10% grasses, 15% forbs, and 75% shrubs and trees. 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 5% of each species of this group, and no more than 20% 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 3% 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	841	1261	1513
Forb	17	252	303
Grass/Grasslike	112	168	202
Total	**970**	**1681**	**2018**

Table 5. Ground cover

Tree foliar cover	0%
Shrub/vine/liana foliar cover	7-23%
Grass/grasslike foliar cover	1-3%
Forb foliar cover	1-5%
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%

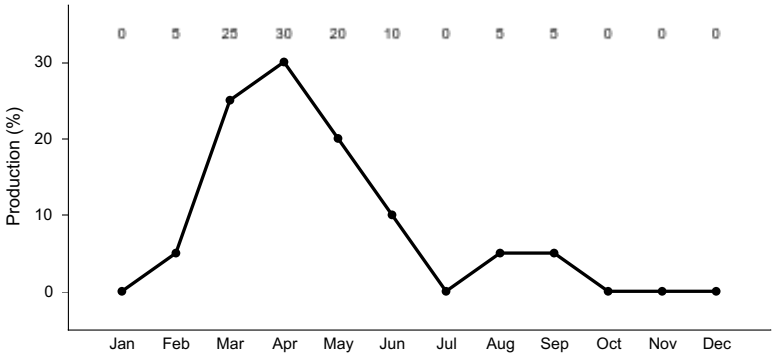


Figure 2. Plant community growth curve (percent production by month). CA3011, Burrobrush . Growth starts in early spring; flowering and seed set occur by June. Plants go dormant as a result of summer stress. New twig and leaf growth are initiated after summer and winter rains..

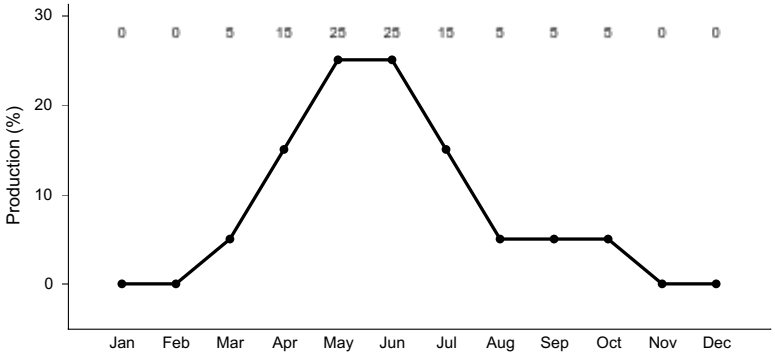


Figure 3. Plant community growth curve (percent production by month). CA3020, Smoketree. Growth starts in early spring, flowering and seed set occur by July. Dormancy occurs during the hot summer months. With sufficient summer/fall precipitation, some vegetation may break dormancy and produce a flush of growth..

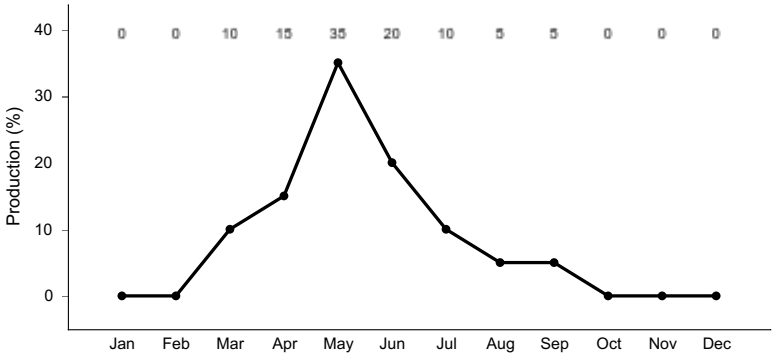


Figure 4. Plant community growth curve (percent production by month). CA3021, Desert Willow. Growth starts in early spring, flowering and seed set occur by July. Dormancy occurs during the hot summer months. With sufficient summer/fall precipitation, some vegetation may break dormancy and produce a flush of growth..

Additional community tables

Animal community

Mammals occurring on this site include long-tailed pocket mice, Merriam's kangaroo rats, cactus mice, woodrats, coyotes and black-tailed jackrabbits.

Common lizards include zebra-tailed lizards, desert spiny lizards, long-tailed brush lizards, side-blotched lizards and western whiptails. Western shovel-nosed snakes also occur.

Birds occurring on this site include Costa's hummingbirds, Northern mockingbirds, phainopeplas, blue-gray and black-tailed gnatcatchers, lesser goldfinches, house finches, horned larks, common ravens, loggerhead shrikes, verdins, Gambel's quail, and several species of wrens and sparrows. Desert willow provides nesting sites for songbirds and cover for other wildlife species. The sucrose in desert willow nectar is a good energy source for bees and hummingbirds. Smoketree provides nesting sites for verdins and gnatcatchers.

: This site has limited value for livestock grazing due to low productivity.
Desert willow and smoketree are considered to be unpalatable to livestock. Use of desert willow by livestock generally indicates overbrowsing or overstocking of the range. Following fire, however, desert willow sprouts may be highly palatable. White burrobush seeds are grazed by domestic sheep. Annual forbs and grasses provide abundant forage during favorable years.

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 1200

Hydrological functions

Runoff is very low to 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: Arizo
Hydrologic Group:A
Hydrologic Conditions and Runoff Curves:

Good 49; Fair 55; Poor 63

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

Recreational uses

This site is valued for open space and those interested in desert ecology. Desert willow, smoketree and wildflowers provide spectacular floral displays especially in years with above average precipitation.

Other information

Military Operations - Vehicle use in washes may alter the vegetation, channel morphology and soil structure. This may result in increased peak flows, accelerated erosion, soil blowing and barren areas. The frequency of flash flooding may also increase with increased surface runoff and loss of vegetative cover. Channel width and depth will also increase. Gully stabilization methods include straw bale checkdams, rock riprap and sand bags. Management for this site would be to protect it from excessive disturbance and maintain existing plant cover.

Inventory data references

Sampling technique

_5_ NV-ECS-1
___ SCS-Range 417
___ Other

Type locality

Location 1: San Bernardino County, CA	
Township/Range/Section	T4N R10E S17
UTM zone	N
UTM northing	3809884
UTM easting	595577
General legal description	SW1/4 Sec. 17 T4N R10E Approximately 14 miles southwest of Amboy, CA Lead Mountain Quadrangle UTM 11S 0595577e 3809884n (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.

Minnich, R., A. Sanders, S. Wood, K. Barrows, J. Lyman. 1993. Natural Resources Management Plan, Marine Corps Air-Ground Combat Center, Twentynine Palms, California. University of Riverside, Department of Earth Sciences and Department of Botany and Plant Sciences.

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	05/14/2025
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:**

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11. **Presence and thickness of compaction layer (usually none; describe soil profile features which may be mistaken for compaction on this site):**

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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):**

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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:**
