USDA Natural Resources
Conservation Service

# Ecological site R030XB149CA
# Gravelly Wash

Last updated: 2/25/2025
Accessed: 05/13/2025

## 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 ephemeral stream channels of inset fans. Elevations are 1600 to 5000 feet. Slopes range from 2 to 8 percent. The soils that characterize this site are very deep and excessively drained. They are formed in mixed alluvium. Surface textures are very gravelly coarse sands and extremely gravelly sandy loams.

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

## Similar sites

| | |
|---|---|
| R030XB136CA | **Dry Wash**<br>Dry Wash [CHLI2 absent; less productive site] |
| R030XB145CA | **Valley Wash**<br>Valley Wash [ACGR important shrub] |

**Table 1. Dominant plant species**

| | |
|---|---|
| Tree | Not specified |
| Shrub | (1) *Larrea tridentata*<br>(2) *Hymenoclea salsola* |
| Herbaceous | Not specified |

## Physiographic features

This site occurs on ephemeral stream channels of inset fans. Elevations are 1600 to 5000 feet. Slopes range from 2 to 8 percent.

**Table 2. Representative physiographic features**

| | |
|---|---|
| Landforms | (1) Drainageway |
| Flooding duration | Brief (2 to 7 days) |
| Flooding frequency | Frequent |
| Elevation | 488–1,524 m |
| 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 8 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 57 to 70 degrees F.

The average frost-free period is 200 to 360 days.

**Table 3. Representative climatic features**

| | |
|---|---|
| Frost-free period (average) | 360 days |
| Freeze-free period (average) | |
| Precipitation total (average) | 203 mm |

## Influencing water features

## Soil features

The soils that characterize this site are very deep and excessively drained. They are formed in mixed alluvium. Surface textures are very gravelly coarse sands and extremely gravelly sandy loams. Subsurface textures are very gravelly coarse sands and very gravelly sandy loams. Available water capacity is very low and permeability is moderately rapid and very 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
221 Arizo inclusion in Arizo complex, 2-4%
slopes
222 Arizo inclusion in Arizo-Twobitter
association, 2-8% slopes

## Ecological dynamics

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

The historic site potential is a low, shrubby, diverse open community. Desert willow is primarily restricted to washes with groundwater available year-round. Ratings of ecological status are not applicable to this site due to the inherent instability of the plant community caused by occasional flooding. Annuals are seasonally present.

As ecological condition deteriorates the perennial grasses and forbs decrease while white burrobush, white bursage, wirelettuce and desert trumpet increase. Non-native plants occurring on this site include schismus, *Schismus arabicus*; red brome, *Bromus rubens*; Russian thistle, *Salsola tragus*; and red-stem filaree, *Erodium cicutarium*.

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.

Species indigenous to this site are recommended for any revegetation efforts.
White burrobush is a short-lived species, although the seeds have high viability and germination rates compared to other desert shrubs. Creosotebush, is a long-lived species, which once established may improve the site for annuals that grow under its canopy by trapping fine soil, organic matter and seeds. Creosotebush can be used for long-term stabilization and for improvement of desert tortoise habitat. Desert willow is also used in soil stabilization plantings. Plants may be successfully propagated by both softwood and hardwood cuttings.

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.

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. White burrobush establishes quickly after fire via off-site seeds and sprouting. Creosotebush possesses limited sprouting ability, thus, can be killed by fire. Desert willow is usually top-killed by fire, but can quickly resprout from the root crown.

## 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 Mojave Wash Scrub. This community is dominated by white burrobush, white bursage and creosotebush. Potential vegetative composition is about 20% grasses, 15% forbs, and 65% 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 5% of each species of this group, and no more than 20% 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 forb 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 | 146 | 291 | 437 |
| Grass/Grasslike | 45 | 90 | 135 |
| Forb | 34 | 67 | 101 |
| **Total** | **225** | **448** | **673** |

**Table 5. Ground cover**

| | |
|---|---|
| Tree foliar cover | 0% |
| Shrub/vine/liana foliar cover | 7-13% |
| Grass/grasslike foliar cover | 2-4% |
| 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% |

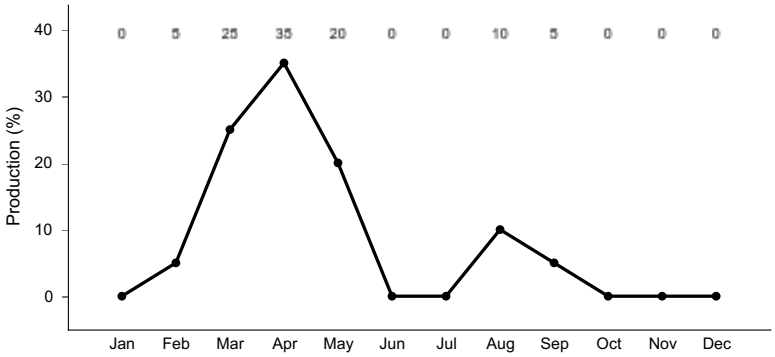


**Figure 2. Plant community growth curve (percent production by month). CA3004, Burrobush XB. Growth starts in early spring, flowering and seed set occur by July. Dormancy occurs during the hot summer months. With sufficient summer/fall precipitation, some vegetation may break dormancy and produce a flush of new growth..**

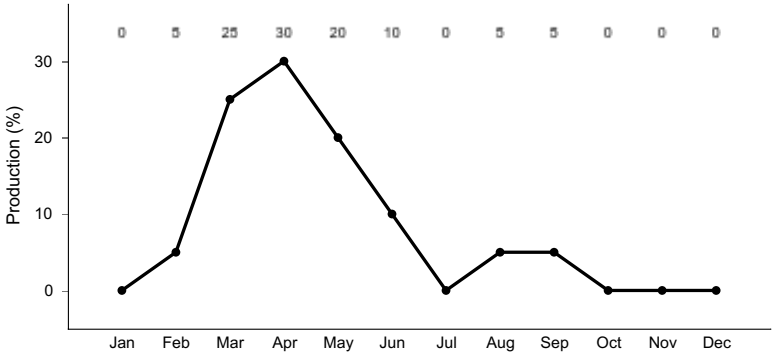


**Figure 3. Plant community growth curve (percent production by month). CA3011, Burrobrush . Growth starts in early spring; flowering and seed set occur by June. Plants go dormant as a result of summer stress. New twig and leaf growth are initiated after summer and winter rains..**

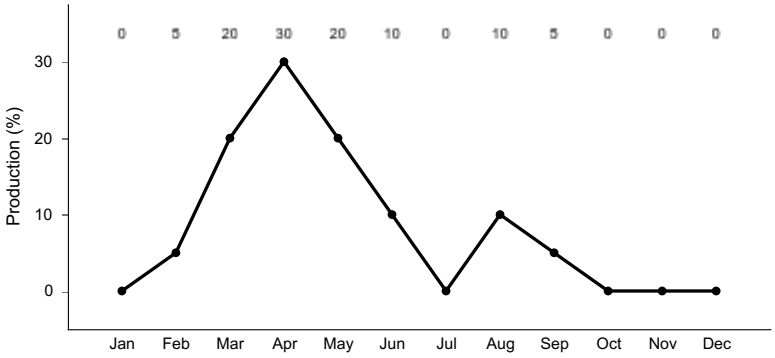


**Figure 4. Plant community growth curve (percent production by month). CA3015, Creosote bush XB. Growth starts in early spring with flowering and seed set occurring by July. Dormancy occurs during the hot summer months. With sufficient summer/fall precipitation, some vegetation may break dormancy and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

## Additional community tables

## Animal community

Mammals occurring on this site include coyotes, black-tailed jackrabbits, Great Basin and Merriam's kangaroo rats, grasshopper and deer mice, and little pocket mice.

Common lizards include the western whiptail, side-blotched lizard, desert horned lizard and zebra-tailed lizard. Desert tortoise frequently den in the banks and berms of washes and feed on vegetation occurring in the wash.

Birds commonly occurring on this site include horned larks, common ravens, cactus wrens, rock wrens, loggerhead shrikes, black-throated sparrows and species of hummingbirds. Desert willow provides nesting sites for desert songbirds and provides nectar for bees and hummingbirds.

LIVESTOCK GRAZING:
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. White burrobush seeds provide forage for domestic sheep. Desert willow and creosotebush are unpalatable to livestock. Annual forbs and grazing provide additional forage, especially 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 400

## 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: Arizo
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

Military Operations - Vehicle use in washes may alter the vegetation, channel morphology and soil structure. This may result in soil compaction, reduced infiltration rates, 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

_2_ NV-ECS-1
___ SCS-Range 417
_1_ Other

## Type locality

| Location 1: San Bernardino County, CA | |
|---|---|
| Township/Range/Section | T16N R6E S17 |
| UTM zone | N |
| UTM northing | 3926150 |
| UTM easting | 558005 |
| General legal description | SE1/4, Sec. 17, T16N R6E Approximately 9 miles east of Drinkwater Lake Red Pass Lake NE Quadrangle UTM 11S 0558005e 3926150n (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, 2/25/2025

## 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 | 05/13/2025 |
| 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):**

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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:**

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