USDA Natural Resources
Conservation Service

Ecological site R030XB126NV
GRAVELLY PEDIMENT 5-7 P.Z.

Last updated: 3/10/2025
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

The soils of this site are on hills and rock pediments. Slopes range from 4 to 30 percent, but slope gradients of 8 to 15 are most typical. Elevations are 2,000 to 2,500 feet. The soil associated with this site are shallow to weathered bedrock and have formed in colluvium and residuum from Triassic sedimentary rocks such as claystone, siltstone, conglomerate and calcareous sandstone.

Please refer to group concept R030XB086CA to view the provisional STM.

Associated sites

R030XB074NV	**COBBLY LOAM 5-7 P.Z.**

Similar sites

R030XB109NV	**GYPSIC BARREN 3-5 P.Z.** ATCO may occur but a minor spp.; less productive site
R030XB124NV	**SHALLOW HILL 3-5 P.Z.** ATCO absent to rare
R030XB131NV	**CALCAREOUS PEDIMENT 3-5 P.Z.** AMDU2-ATCO codominant; ENAR codominant
R030XB026NV	**GYPSIC LOAM 3-5 P.Z.** ATHY codominant shrub; much less productive site
R030XB010NV	**LOAMY SLOPE 5-7 P.Z.** ACSP12 dominant plant; PSFR minor shrub
R030XB125NV	**CHANNERY HILL 3-5 P.Z.** ATCO-ATCO codominant; PSFR minor shrub
R030XB106NV	**GRAVELLY SLOPE 5-7 P.Z.** PLRI3 dominant plant; more productive site
R030XB117NV	**GYPSIC SAND 3-5 P.Z.** ATCO rare to absent; ATCA2 and PEPA13 important shrubs

Table 1. Dominant plant species

Tree	Not specified
Shrub	(1) *Psorothamnus fremontii* (2) *Ambrosia dumosa*
Herbaceous	Not specified

Physiographic features

The soils of this site are on hills and rock pediments. Slopes range from 4 to 30 percent, but slope gradients of 8 to 15 are most typical. Elevations are 2,000 to 2,500 feet.

Table 2. Representative physiographic features

Landforms	(1) Hill (2) Pediment
Elevation	610–762 m
Slope	4–30%

Climatic features

The climate is hot and arid, with mild winters and very hot summers. Precipitation is greatest in the winter with a lesser secondary peak in summer, typical of the Mojave Desert. The climate is hot and arid with warm moist winters and hot, dry summers. The mean annual precipitation is about 5 to 7 inches. The mean annual air temperature is about 64 to 69 degrees F. The frost free season 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

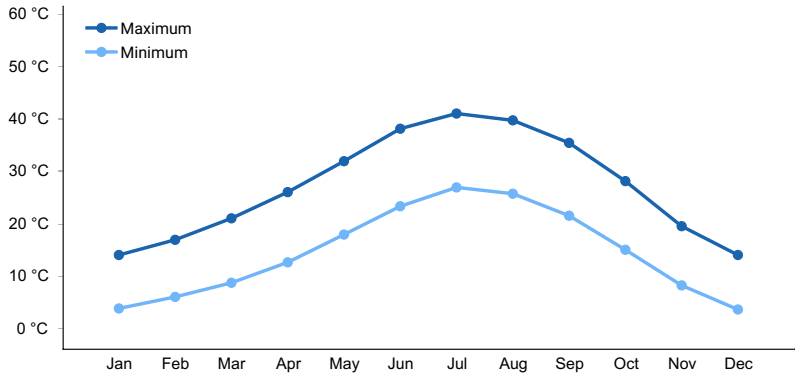

Figure 1. Monthly average minimum and maximum temperature

Influencing water features

There are no influencing water features associated with this site.

Soil features

The soil associated with this site are shallow to weathered bedrock and have formed in colluvium and residuum from Triassic sedimentary rocks such as claystone, siltstone, conglomerate and calcareous sandstone. These sites are well drained and have slow permeability. Available water holding capacity is very low and runoff is high.

Table 4. Representative soil features

Drainage class	Well drained
Permeability class	Slow

Ecological dynamics

Please refer to group concept R030XB086CA to view the provisional STM.

As ecological condition deteriorates, big galleta and other perennial grasses decrease and interspaces between shrubs increase. In a deteriorated condition, annual grasses and forbs will probably invade this site.

Fire ecology:
Fires in the Mojave desert are infrequent and of low severity because production of annual and perennial herbs seldom provides a fuel load capable of sustaining fire. Fire generally kills white bursage. However, most white bursage plants burned because their canopies contained numerous small branches in proximity to herbaceous fuels. Shadscale 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. The mean fire return interval for shadscale communities range from 35 to 100 years. Increased presence of non-native annual grasses, such as cheatgrass, can alter fire regimes by increasing fire frequency under wet to near-normal summer moisture conditions. Range ratany is top-killed by fire. Range ratany resprouts from the root crown after fire. Fires in creosotebush scrub were an infrequent event in pre-settlement desert habitats, because fine fuels from winter annual plants were probably sparse, only occurring in large amounts during exceptionally wet winters. Fire kills many creosotebush. Creosotebush is poorly adapted to fire because of its limited sprouting ability. Creosotebush survives some fires that burn patchily or are of low severity.

State and transition model

Ecosystem states

1. Reference Plant Community

State 1 submodel, plant communities

1.1. Reference Plant Community

State 1
Reference Plant Community

Community 1.1
Reference Plant Community

The reference plant community is dominated by Fremont dalea, white bursage, and shadscale. Potential vegetative composition is about 5% grasses, 10% annual and perennial forbs, and 85% shrubs. Approximate ground cover (basal and crown) is 10 to 15 percent.

Table 5. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Shrub/Vine	191	381	572
Forb	22	45	67
Grass/Grasslike	11	22	34
Total	**224**	**448**	**673**

Additional community tables

Table 6. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Kg/Hectare)	Foliar Cover (%)
Grass/Grasslike					
1	**Perennial grasses**			1–22	
	low woollygrass	DAPU7	*Dasyochloa pulchella*	2–13	–
	big galleta	PLRI3	*Pleuraphis rigida*	2–13	–
2	**Annual Grasses**			1–22	
Forb					
3	**Perennial forbs**			1–22	
	desert globemallow	SPAM2	*Sphaeralcea ambigua*	2–13	–
4	**Annual forbs**			1–22	
	desert trumpet	ERIN4	*Eriogonum inflatum*	2–13	–
Shrub/Vine					
5	**Primary shrubs**			278–507	
	Fremont's dalea	PSFR	*Psorothamnus fremontii*	90–135	–
	burrobush	AMDU2	*Ambrosia dumosa*	67–112	–
	shadscale saltbush	ATCO	*Atriplex confertifolia*	67–112	–
	woody crinklemat	TICA3	*Tiquilia canescens*	22–45	–
	creosote bush	LATR2	*Larrea tridentata*	9–36	–
6	**Secondary shrubs**			22–90	
	Fremont's chaffbush	AMFR2	*Amphipappus fremontii*	4–22	–
	hedgehog cactus	ECHIN3	*Echinocereus*	4–22	–
	brittlebush	ENFA	*Encelia farinosa*	4–22	–
	Nevada jointfir	EPNE	*Ephedra nevadensis*	4–22	–
	California barrel cactus	FECY	*Ferocactus cylindraceus*	4–22	–
	beavertail pricklypear	OPBA2	*Opuntia basilaris*	4–22	–

Animal community

Livestock Interpretations:
This site has limited value for livestock grazing, due to the low forage production, steep slopes and stony surface. White bursage is of intermediate forage value. It is fair to good forage for horses and fair to poor for cattle and sheep. However, because there is often little other forage where white bursage grows, it is often highly valuable to browsing animals and is sensitive to browsing. Shadscale provides good browse for domestic sheep and goats. Shadscale leaves and seeds are an important component of domestic sheep and cattle winter diets. Shadscale tends to be browse tolerant. Heavy grazing during the winter and/or spring reduces shadscale. Die-off can also occur during extended periods of high precipitation. Shadscale is tolerant of early spring light-intensity browsing. Range ratany is an important forage species for all classes of livestock. Palatability of range ratany is rated fair to good for cattle and sheep. Creosotebush is unpalatable to livestock. Consumption of creosotebush may be fatal to sheep.

Stocking rates vary over time depending upon season of use, climate variations, site, and previous and current management goals. A safe starting stocking rate is an estimated stocking rate that is fine tuned by the client by adaptive management through the year and from year to year.

Wildlife Interpretations:
White bursage is an important browse species for wildlife. Shadscale is a valuable browse species providing a source of palatable, nutritious forage for a wide variety of wildlife. The fruits and leaves are a food source for deer, desert bighorn sheep and pronghorn antelope. Range ratany is an important forage species for deer. Mule deer

browse range ratany year-long with seasonal peaks. Mule deer peak use is from February to April and from August to October. Creosotebush is unpalatable to most browsing wildlife.

Hydrological functions

These sites are well drained and have slow permeability. Available water holding capacity is very low and runoff is high.

Other products

White bursage is a host for sandfood, a parasitic plant. Sandfood was a valuable food supply for Native Americans. Seeds of shadscale were used by Native Americans for bread and mush. The Papago Indians used an infusion of range ratany twigs externally for treating sore eyes and internally for dysentery. The roots provided them with a red dye for wool and other materials. The dye was also used as an ink. Creosotebush has been highly valued for its medicinal properties by Native Americans. It has been used to treat at least 14 illnesses. Twigs and leaves may be boiled as tea, steamed, pounded into a powder, pressed into a poultice, or heated into an infusion.

Other information

White bursage may be used to revegetate disturbed sites in southwestern deserts. Once established, creosotebush may improve sites for annuals that grow under its canopy by trapping fine soil, organic matter, and symbiont propagules. It may also increase water infiltration and storage.

Type locality

Location 1: Clark County, NV	
Township/Range/Section	T19S R66E S16
General legal description	Bitter Spring Valley area, about 20 miles south of Moapa, Nevada.

Other references

Fire Effects Information System (Online; http://www.fs.fed.us/database/feis/plants/).

USDA-NRCS Plants Database (Online; http://www.plants.usda.gov).

Contributors

CJT/DJM

Approval

Kendra Moseley, 3/10/2025

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):**

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:**
