USDA Natural Resources
Conservation Service

Ecological site R030XB128NV
SHALLOW LIMESTONE HILL 5-7 P.Z.

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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 on mesa summits and upper sideslopes on all aspects. Slopes range from 4 to 30 percent. Elevations are 3000 to 4000 feet. The soil associated with this site are shallow and very shallow to bedrock and well drained. They have formed in residuum and colluvium from sandstone and limestone conglomerate.

Please refer to group concept R030XB094CA to view the provisional STM.

Associated sites

R030XB124NV	**SHALLOW HILL 3-5 P.Z.**

Similar sites

R030XB030NV	**SHALLOW LIMESTONE SLOPE 5-7 P.Z.** ACSP12 dominant grass; less productive site
R030XB015NV	**SHALLOW GRAVELLY SLOPE 7-9 P.Z.** PLRI3 & BOER4 dominant grasses
R030XB135NV	**Steep Limestone Hill** MOUT & TICA3 important shrubs
R030XB107NV	**COARSE GRAVELLY LOAM 5-7 P.Z.** PLRI3 dominant grass; more productive site
R030XB057NV	**SHALLOW GRANITIC LOAM 5-7 P.Z.** AMDU2 minor species; ACSP12 dominant grass
R030XB014NV	**SHALLOW GRAVELLY LOAM 7-9 P.Z.** BOER4 dominant grass, more productive site
R030XB029NV	**SHALLOW GRAVELLY LOAM 5-7 P.Z.** PLRI3 dominant grass
R030XB136NV	**SHALLOW LIMESTONE 7-9 P.Z.** MOUT & TICA3 important shrubs; more productive site
R030XB056NV	**SHALLOW GRANITIC SLOPE 5-7 P.Z.** AMDU2 minor species; less productive site

Table 1. Dominant plant species

Tree	Not specified
Shrub	(1) *Coleogyne ramosissima* (2) *Ambrosia dumosa*
Herbaceous	Not specified

Physiographic features

This site occurs on mesa summits and upper sideslopes on all aspects. Slopes range from 4 to 30 percent. Elevations are 3000 to 4000 feet.

Table 2. Representative physiographic features

Landforms	(1) Mesa
Elevation	3,000–4,000 ft
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 average annual precipitation ranges from 5 to 7 inches with most moisture falling as rain from November to March. At least 30 percent of the total annual precipitation occurs from July to September as a result of summer convection storms. Mean annual air temperature is 57 to 63 degrees F. The average frost-free period is 180 to 240 days.

Table 3. Representative climatic features

Frost-free period (average)	240 days
Freeze-free period (average)	
Precipitation total (average)	7 in

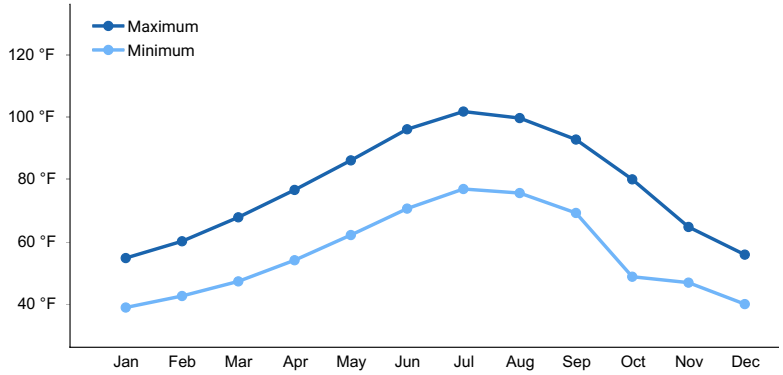

Figure 1. Monthly average minimum and maximum temperature

Influencing water features

There are no influencing water features associated with this site.

Soil features

The soil associated with this site are shallow and very shallow to bedrock and well drained. They have formed in residuum and colluvium from sandstone and limestone conglomerate. These soils typically have 35 to 60 percent rock fragments (by volume) within the soil profile. Runoff is very high and permeability is moderately rapid.

Table 4. Representative soil features

Drainage class	Well drained
Permeability class	Moderately rapid

Ecological dynamics

Please refer to group concept R030XB094CA to view the provisional STM.

As ecological condition deteriorates blackbrush increases almost to the exclusion of all other species. Following wildfire, non-native annual grasses and forbs, threeawn and broom snakeweed increase or invade this site. Current understanding of blackbrush ecology indicates that one hundred, or more, years may be required for reestablishment of blackbrush after fire.

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. Low amounts of fine fuels in interspaces probably limited fire spread to only extreme fire conditions, during which high winds, low relative humidity, and low fuel moisture led to high intensity stand-replacing crown fires. Historical fire return intervals appear to have been on the order of centuries, allowing late seral blackbrush stands to reestablish. Blackbrush stands are subject to fire, and fire will start and spread easily due to the dense, close spacing nature and resinous foliage of blackbrush. Blackbrush is slow to reestablish. 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 seed on the plant. Low-severity fire scorches or only partially consumes the aboveground portions of winterfat and thus does not cause high mortality.

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

Blackbrush and white bursage dominate the reference plant community. Potential vegetative composition is about 10% grasses, 10% annual and perennial forbs, and 80% shrubs. Approximate ground cover (basal and crown) is 15 to 25 percent.

Table 5. Annual production by plant type

Plant Type	Low (Lb/Acre)	Representative Value (Lb/Acre)	High (Lb/Acre)
Shrub/Vine	160	240	400
Grass/Grasslike	20	30	50
Forb	20	30	50
Total	**200**	**300**	**500**

Additional community tables

Table 6. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Lb/Acre)	Foliar Cover (%)
Grass/Grasslike					
1	**Perennial grasses**			6–45	
	purple threeawn	ARPU9	*Aristida purpurea*	2–15	–
	low woollygrass	DAPU7	*Dasyochloa pulchella*	2–15	–
	bush muhly	MUPO2	*Muhlenbergia porteri*	2–15	–
	big galleta	PLRI3	*Pleuraphis rigida*	2–15	–
	slim tridens	TRMU	*Tridens muticus*	2–15	–
2	**Annual Grasses**			1–15	
Forb					
3	**Perennial forbs**			2–24	
	desert globemallow	SPAM2	*Sphaeralcea ambigua*	2–6	–
4	**Annual forbs**			1–15	
Shrub/Vine					
5	**Primary shrubs**			198–285	
	blackbrush	CORA	*Coleogyne ramosissima*	150–180	–
	burrobush	AMDU2	*Ambrosia dumosa*	30–60	–
	jointfir	EPHED	*Ephedra*	6–15	–
	winterfat	KRLA2	*Krascheninnikovia lanata*	6–15	–
	Fremont's dalea	PSFR	*Psorothamnus fremontii*	6–15	–
6	**Secondary shrubs**			15–45	
	Fremont's chaffbush	AMFR2	*Amphipappus fremontii*	3–15	–
	desertholly	ATHY	*Atriplex hymenelytra*	3–15	–
	cottontop cactus	ECPO2	*Echinocactus polycephalus*	3–15	–
	white ratany	KRGR	*Krameria grayi*	3–15	–
	creosote bush	LATR2	*Larrea tridentata*	3–15	–
	water jacket	LYAN	*Lycium andersonii*	3–15	–
	Mojave woodyaster	XYTO2	*Xylorhiza tortifolia*	3–15	–

Animal community

Livestock Interpretations:
This site has limited value for livestock grazing, due to the low forage production, steep slopes and stony surfaces. Blackbrush areas are economically important for winter grazing by domestic livestock, especially sheep. But it does provide poor forage during the spring, summer, and fall for domestic cattle, horses, and domestic sheep. 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. Winterfat is an important forage plant for livestock in salt-desert shrub rangeland and subalkaline flats. Winterfat palatability is rated as good for sheep, good to fair for horses, and fair for cattle. Abusive grazing practices have reduced or eliminated winterfat on some areas even though it is fairly resistant to browsing. Grazing season has more influence on winterfat than grazing intensity. Early winter grazing may actually be beneficial.

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:
Blackbrush areas are economically important for winter grazing primarily for several wildlife species. Mule deer and bighorn sheep generally use the blackbrush vegetation type in winter. White bursage is an important browse species for wildlife. Winterfat is an important forage plant for wildlife in salt-desert shrub rangeland and subalkaline flats. Animals that browse winterfat include mule deer, Rocky Mountain elk, desert bighorn sheep, and pronghorn antelope.

Hydrological functions

Runoff is very high and permeability is moderately rapid.

Other products

White bursage is a host for sandfood, a parasitic plant. Sandfood was a valuable food supply for Native Americans.

Other information

White bursage may be used to revegetate disturbed sites in southwestern deserts.

Type locality

Location 1: Clark County, NV	
Township/Range/Section	T19S R65E S27
General legal description	Approximately three miles southwest of Muddy Peak, north of Gale Hills, east of Las Vegas, Clark County, 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

PN-E/GKB

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:**

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:**
