

# Ecological site R030XA002NV

## LIMESTONE HILL 5-7 P.Z.

Last updated: 10/21/2024  
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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 the summits and sideslopes of lower mountains on all aspects. Slopes range from 4 to 75 percent, but slope gradients of 15 to 50 percent are most typical. Elevations are 1600 to 5600 feet.

The soils associated with this site are very shallow and are well drained to somewhat excessively drained. These soils have formed in colluvium from limestone. The soil profile is modified with 50 to 75 percent rock fragments.

Please refer to group concept R030XB002NV to view the provisional STM.

### Associated sites

R030XA006NV	SHALLOW LIMESTONE SLOPE 5-7 P.Z.
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### Similar sites

R030XA044NV	<b>LOAMY HILL 5-7 P.Z.</b> LYAN major shrub; ARSP5, ELEL5 and PLJA expected to occur on site.
R030XA068NV	<b>CALCAREOUS HILL 5-7 P.Z.</b> MESP2 and LYAN major shrubs
R030XA006NV	<b>SHALLOW LIMESTONE SLOPE 5-7 P.Z.</b> CORA dominant plant
R030XA056NV	<b>LOAMY HILL 3-5 P.Z.</b> Soil PM not limestone or dolomite; ephedra minor occurrence

Table 1. Dominant plant species

Tree	Not specified
Shrub	(1) <i>Atriplex confertifolia</i> (2) <i>Ambrosia dumosa</i>
Herbaceous	(1) <i>Achnatherum speciosum</i> (2) <i>Pleuraphis rigida</i>

### Physiographic features

This site occurs on the summits and sideslopes of lower mountains on all aspects. Slopes range from 4 to 75 percent, but slope gradients of 15 to 50 percent are most typical. Elevations are 1600 to 5600 feet.

Table 2. Representative physiographic features

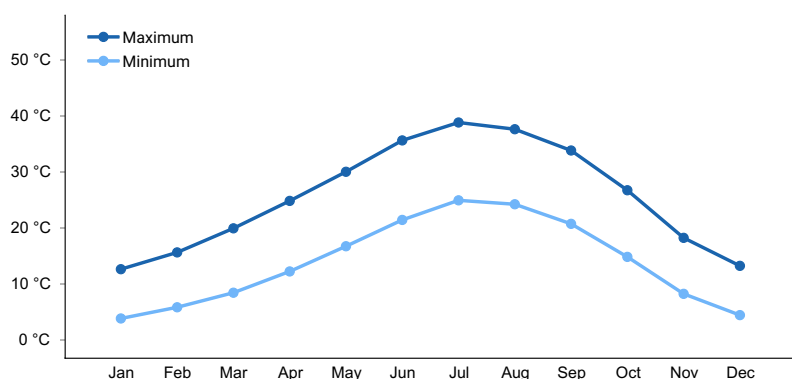
Landforms	(1) Mountain
Flooding duration	Very brief (4 to 48 hours)
Flooding frequency	Very rare
Ponding frequency	None
Elevation	488–1,707 m
Slope	4–75%
Aspect	Aspect is not a significant factor

## 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. Average annual precipitation is 5 to 7 inches. Mean annual air temperature is 63 to 66 degrees F. The average growing season is about 200 to 280 days.

**Table 3. Representative climatic features**

Frost-free period (average)	280 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 soils associated with this site are very shallow and are well drained to somewhat excessively drained. These soils have formed in colluvium from limestone. The soil profile is modified with 50 to 75 percent rock fragments. High amounts of rock fragments occur at the soil surface which occupy plant growing space yet help to reduce evaporation and conserve soil moisture. Coarse fragments on the surface provide a stabilizing affect of surface erosion conditions. The soil series associated with this site includes: Birdspring.

**Table 4. Representative soil features**

Parent material	(1) Colluvium–limestone
Surface texture	(1) Extremely gravelly fine sandy loam (2) Very gravelly fine sandy loam (3) Very gravelly loam
Family particle size	(1) Loamy

Drainage class	Well drained to somewhat excessively drained
Permeability class	Moderate to moderately rapid
Soil depth	10–25 cm
Surface fragment cover <=3"	60–70%
Surface fragment cover >3"	6–15%
Available water capacity (0-101.6cm)	0.25–0.51 cm
Calcium carbonate equivalent (0-101.6cm)	10–40%
Electrical conductivity (0-101.6cm)	0–2 mmhos/cm
Sodium adsorption ratio (0-101.6cm)	0–5
Soil reaction (1:1 water) (0-101.6cm)	7.9–9
Subsurface fragment volume <=3" (Depth not specified)	53–64%
Subsurface fragment volume >3" (Depth not specified)	0–6%

## Ecological dynamics

Please refer to group concept R030XB002NV to view the provisional STM.

As ecological condition deteriorates, creosotebush increases. Introduced annual grasses and forbs readily invade this site.

### Fire Ecology:

The mean fire return interval for shadscale communities ranges from 35 to 100 years. 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. Increased presence of non-native annual grasses, such as cheatgrass, can alter fire regimes in shadscale communities by increasing fire frequency under wet to near-normal summer moisture conditions. When fire does occur, the effect on the ecosystem may be extreme. Shadscale is fire intolerant and it does not readily recover from fire, except for establishment through seed. Fire generally kills white bursage. Desert needlegrass has persistent dead leaf bases, which make it susceptible to burning. Fire removes the accumulation; a rapid, cool fire will not burn deep into the root crown. Damage to big galleta from fire varies. If big galleta is dry, damage may be severe. However, when plants are green, fire will tend to be less severe and damage may be minimal, with big galleta recovering quickly.

## State and transition model

### Ecosystem states

1. Reference State
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State 1 submodel, plant communities

1.1. Reference Plant Community

State 1  
Reference State

Community 1.1  
Reference Plant Community

The reference plant community is dominated by shadscale. White bursage, Torrey's ephedra, desert needlegrass and big galleta are other important species associated with this site. Potential vegetative composition is about 20% grasses, 5% annual and perennial forbs and 75% shrubs. Approximate ground cover (basal and crown) is less than 10 percent.

Table 5. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Shrub/Vine	64	148	211
Grass/Grasslike	17	39	56
Forb	3	9	13
Total	84	196	280

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	Primary Perennial Grasses			20–40	
	desert needlegrass	ACSP12	<i>Achnatherum speciosum</i>	10–20	–
	big galleta	PLRI3	<i>Pleuraphis rigida</i>	10–20	
2	Secondary Perennial Grasses			4–20	
	Indian ricegrass	ACHY	<i>Achnatherum hymenoides</i>	1–10	–
	threeawn	ARIST	<i>Aristida</i>	1–10	–
	low woollygrass	DAPU7	<i>Dasyochloa pulchella</i>	1–10	–
	slim tridens	TRMU	<i>Tridens muticus</i>	1–10	–
3	Perennial Warm Season Bunchgrass (Mid 1-3')			2–20	
Forb					
4	Perennial			1–10	
5	Annual			1–10	
Shrub/Vine					
6	Primary shrubs			120–194	
	shadscale saltbush	ATCO	<i>Atriplex confertifolia</i>	78–99	–
	burrobush	AMDU2	<i>Ambrosia dumosa</i>	20–39	–
	Torrey's jointfir	EPTO	<i>Ephedra torreyana</i>	20–39	–
	desertholly	ATHY	<i>Atriplex hymenelytra</i>	1–17	–
7	Secondary shrubs			10–29	
	winterfat	KRLA2	<i>Krascheninnikovia lanata</i>	2–10	–
	creosote bush	LATR2	<i>Larrea tridentata</i>	2–10	–
	spiny menodora	MESP2	<i>Menodora spinescens</i>	2–10	–
	Fremont's dalea	PSFR	<i>Psoralea fremontii</i>	2–10	–
	Mojave woodyaster	XYTO2	<i>Xylorhiza tortifolia</i>	2–10	–
	Joshua tree	YUBR	<i>Yucca brevifolia</i>	2–10	–
	Mojave yucca	YUSC2	<i>Yucca schidigera</i>	2–10	–

## Animal community

### Livestock Interpretations:

This site is poorly suited to livestock grazing, due to the low forage production and steep slopes. Grazing management should be keyed to big galleta and desert needlegrass. Desert needlegrass produces considerable basal foliage and is good forage while young. Young desert needlegrass is palatable to all classes of livestock. Mature herbage is moderately grazed by horses and cattle but rarely grazed by sheep. Big galleta is considered a valuable forage plant for cattle and domestic sheep. Its coarse, rigid culms make it relatively resistant to heavy grazing and trampling. Shadscale is a valuable browse species, providing a source of palatable, nutritious forage for a wide variety of livestock. Shadscale provides good browse for domestic sheep. Shadscale leaves and seeds are an important component of domestic sheep and cattle winter diets. White bursage is an important browse species. Browsing pressure on white bursage is particularly heavy during years of low precipitation, when production of winter annuals is low. 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.

### Wildlife Interpretations:

White bursage and shadscale are valuable browse species, providing a source of palatable, nutritious forage for a wide variety of wildlife particularly during spring and summer. They supply browse, seed, and cover for birds, small

mammals, rabbits, deer, and pronghorn antelope. Desert needlegrass and big galleta are also important forage species for several wildlife species.

Hydrological functions

Runoff is very high. Permeability is moderate to moderately rapid.

Other products

White bursage is a host for sandfood, a parasitic plant with a sweet, succulent, subterranean flowerstalk. Sandfood was a valuable food supply for desert peoples.  
Seeds of shadscale were used by Native Americans of Arizona, Utah and Nevada for bread and mush.

Other information

Desert needlegrass seeds are easily germinated and have potential for commercial use. Desert needlegrass may be used for groundcover in areas of light disturbance, but it is susceptible to excessive trampling. White bursage may be used to revegetate disturbed sites in southwestern deserts.

Type locality

Location 1: Clark County, NV	
Township/Range/Section	T23S R60E S31
General legal description	Low-lying hills just east of Bird Spring Range, 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

BLS/GKB

Approval

Kendra Moseley, 10/21/2024

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)	P NOVAK-ECHENIQUE
Contact for lead author	State Rangeland Management Specialist
Date	07/20/2012
Approved by	Kendra Moseley
Approval date	

## Indicators

1. **Number and extent of rills:** Rills are none to rare. Rock fragments armor the surface.

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2. **Presence of water flow patterns:** Waterflow patterns are none to rare. Rock fragments armor the surface.

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3. **Number and height of erosional pedestals or terracettes:** Pedestals are none.

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4. **Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):** Bare Ground 5-10%.

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5. **Number of gullies and erosion associated with gullies:** None

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6. **Extent of wind scoured, blowouts and/or depositional areas:** None

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7. **Amount of litter movement (describe size and distance expected to travel):** Fine litter (foliage from grasses and annual & perennial forbs) expected to move distance of slope length during intense summer convection storms or rapid snowmelt events. Persistent litter (large woody material) will remain in place except during large rainfall events.

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8. **Soil surface (top few mm) resistance to erosion (stability values are averages - most sites will show a range of values):** Soil stability values should be 1 to 4 on most soil textures found on this site. (To be field tested.)

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9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** Surface structure is typically moderate fine and medium subangular blocky or moderate thick to weak thin platy structure. Soil surface colors are light and soils are typified by an ochric epipedon. Organic matter of the surface horizon is typically <1 percent dropping off quickly below. Organic matter content can be more or less depending on micro-topography.

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10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:** Sparse shrub canopy and associated litter provide some protection from raindrop impact.

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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):** Compacted layers are none. Subsoil calcic horizons are not to be interpreted as compacted.

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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: Mojave Desert shrubs

Sub-dominant: deep-rooted, cool-season, bunchgrasses > deep-rooted, warm-season, bunchgrasses > annual forbs > perennial forbs > annual grasses

Other:

Additional:

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13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):** Dead branches within individual shrubs common and standing dead shrub canopy material may be as much as 25% of total woody canopy; some of the mature bunchgrasses (<10%) have dead centers.
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14. **Average percent litter cover (%) and depth ( in):** Under canopy and between plant interspaces up to 20%.
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15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):** For normal or average growing season  $\pm$  150 lbs/ac. Favorable years 250 lbs/ac and unfavorable years 75 lbs/ac.
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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:** Red brome, red-stem filaree and Mediterranean grass are invaders on this site.
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17. **Perennial plant reproductive capability:** All functional groups should reproduce in average (or normal) and above average growing season years. Little growth or reproduction occurs in drought years.
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