

Ecological site R030XA006NV **SHALLOW LIMESTONE SLOPE 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 hills, mountains, fan remnants and plateaus on all exposures. Slopes range from 2 to 75 percent, but slope gradients of 2 to 15 percent are typical. Elevations are 2600 to 5200 feet.

The soils associated with this site are very shallow over limestone bedrock and have formed in residuum and colluvium from limestone or dolomite parent materials.

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

Associated sites

R030XA002NV	LIMESTONE HILL 5-7 P.Z.
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Similar sites

R030XA095NV	SHALLOW GRAVELLY SLOPE 5-7 P.Z. ATCO rare to absent; Parent material not limestone or dolomite.
R030XA002NV	LIMESTONE HILL 5-7 P.Z. CORA rare to absent.
R030XA094NV	SHALLOW GRAVELLY LOAM 5-7 P.Z. ATCO rare to absent; Parent material not limestone or dolomite.

Table 1. Dominant plant species

Tree	Not specified
Shrub	(1) <i>Coleogyne ramosissima</i> (2) <i>Atriplex confertifolia</i>
Herbaceous	(1) <i>Achnatherum speciosum</i>

Physiographic features

This site occurs on hills, mountains, fan remnants and plateaus on all exposures. Slopes range from 2 to 75 percent, but slope gradients of 2 to 15 percent are typical. Elevations are 2600 to 5200 feet.

Table 2. Representative physiographic features

Landforms	(1) Mountain (2) Fan remnant (3) Hill
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Flooding frequency	None
Ponding frequency	None
Elevation	2,600–5,200 ft
Slope	2–75%
Water table depth	0 in
Aspect	Aspect is not a significant factor

Climatic features

The climate of the Mojave Desert has extreme fluctuations of daily temperatures, strong seasonal winds, and clear skies. The climate is arid and is characterized with cool, moist winters and hot, dry summers. Most of the rainfall falls between November and April. Summer convection storms from July to September may contribute up to 25 percent of the annual precipitation. Average annual precipitation is 5 to 7 inches. Mean annual air temperature is 57 to 63 degrees F. The average growing season is about 180 to 240 days.

Table 3. Representative climatic features

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

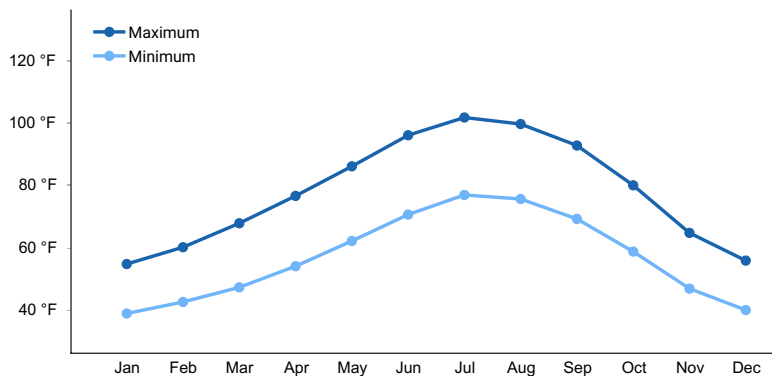


Figure 1. Monthly average minimum and maximum temperature

Influencing water features

There are no influencing water features associated with this site.

Soil features

The soils associated with this site are very shallow over limestone bedrock and have formed in residuum and colluvium from limestone or dolomite parent materials. These soils are somewhat excessively drained and have moderately rapid permeability.

The representative soil series associated with this site is Birdspring, a loamy-skeletal carbonatic, thermic Lithic Torriorthent. The soil moisture regime is typic-aridic and the temperature regime is thermic. An ochric epipedon occurs from the soil surface to four inches. Reaction is moderately alkaline.

Table 4. Representative soil features

Parent material	(1) Residuum–dolomite
Surface texture	(1) Extremely stony loam
Family particle size	(1) Loamy

Drainage class	Somewhat excessively drained
Permeability class	Moderately rapid
Soil depth	4–10 in
Surface fragment cover ≤3"	30–64%
Surface fragment cover >3"	6–50%
Available water capacity (0–40in)	0.2–1.8 in
Calcium carbonate equivalent (0–40in)	15–25%
Electrical conductivity (0–40in)	0–2 mmhos/cm
Sodium adsorption ratio (0–40in)	0–5
Soil reaction (1:1 water) (0–40in)	7.9–8.4
Subsurface fragment volume ≤3" (Depth not specified)	24–64%
Subsurface fragment volume >3" (Depth not specified)	5–38%

Ecological dynamics

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

Blackbrush often occurs as nearly monospecific stands and is thought to be climax vegetation, occurring in late seral stages. Blackbrush is long-lived and, dominant on older, undisturbed geologic sites. Succession occurs at a very slow rate. Increasing in cover and density, this shrub becomes more dominant over time. Blackbrush and shadscale increase almost to the exclusion of all other species. Following wildfire, shadscale and fire tolerant/crown-sprouting shrubs increase and often dominate this site. Greater than 60 years may be required for reestablishing a blackbrush stand following fire.

Fire Ecology:

Historic fire return intervals for blackbrush communities appear to have been on the order of centuries, allowing late seral blackbrush stands to establish. 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. Increased presence of non-native annual grasses, such as cheatgrass, can alter fire regimes in blackbrush communities by increasing fire frequency under wet to near-normal summer moisture conditions. Blackbrush is a nonsprouter after fire and does not aggressively return to burned sites. Shadscale is generally killed by fire and is fire intolerant. It does not resprout following fire; however, regeneration from onsite seed is common following fire. 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.

Indian ricegrass can be killed by fire, depending on severity and season of burn. Indian ricegrass reestablishes on burned sites through seed dispersed from adjacent unburned areas.

State and transition model

Ecosystem states

1. Reference State

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 blackbrush and shadscale. Other important species of this site are ephedra and desert needlegrass. Potential vegetative composition is about 20% grasses, 5% annuals and perennial forbs, and 75% shrubs. Approximate ground cover (basal and crown) is 15 to 20 percent.

Table 5. Annual production by plant type

Plant Type	Low (Lb/Acre)	Representative Value (Lb/Acre)	High (Lb/Acre)
Shrub/Vine	206	263	337
Grass/Grasslike	55	70	90
Forb	14	17	23
Total	275	350	450

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	Primary Perennial Grasses			37–77	
	desert needlegrass	ACSP12	<i>Achnatherum speciosum</i>	35–70	–
2	Secondary Perennial Grasses			7–28	
	Indian ricegrass	ACHY	<i>Achnatherum hymenoides</i>	2–7	–
	threeawn	ARIST	<i>Aristida</i>	2–7	–
	low woollygrass	DAPU7	<i>Dasyochloa pulchella</i>	2–7	–
	big galleta	PLRI3	<i>Pleuraphis rigida</i>	2–7	–
	slim tridens	TRMU	<i>Tridens muticus</i>	2–7	–
3	Annual Grasses			1–18	
Forb					
4	Perennial			1–18	
	threeawn	ARIST	<i>Aristida</i>	2–7	–
	slim tridens	TRMU	<i>Tridens muticus</i>	2–7	–
	desert globemallow	SPAM2	<i>Sphaeralcea ambigua</i>	2–7	–
5	Annual			1–18	
Shrub/Vine					
6	Primary shrubs			236–379	
	blackbrush	CORA	<i>Coleogyne ramosissima</i>	140–175	–
	shadscale saltbush	ATCO	<i>Atriplex confertifolia</i>	70–105	–
	burrobush	AMDU2	<i>Ambrosia dumosa</i>	18–53	–
	spiny menodora	MESP2	<i>Menodora spinescens</i>	1–18	–
	Nevada jointfir	EPNE	<i>Ephedra nevadensis</i>	4–14	–
	Torrey's jointfir	EPTO	<i>Ephedra torreyana</i>	4–14	–
7	Secondary shrubs			18–53	
	desert marigold	BAMU	<i>Baileya multiradiata</i>	4–11	–
	creosote bush	LATR2	<i>Larrea tridentata</i>	4–11	–
	desert pepperweed	LEFR2	<i>Lepidium fremontii</i>	4–11	–
	wirelettuce	STEPH	<i>Stephanomeria</i>	4–11	–
	Mojave woodyaster	XYTO2	<i>Xylorhiza tortifolia</i>	4–11	–

Animal community

Livestock Interpretations:

This site is suitable for spring sheep grazing and marginally suitable for cattle grazing due to low forage production and limited water availability. Young desert needlegrass is palatable to all classes of livestock. Mature herbage is moderately grazed by horses and cattle but rarely grazed by sheep.

Blackbrush is not preferred as forage by domestic livestock, but does provide some forage during the spring, summer and fall. 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. Nevada ephedra is important winter range browse for domestic cattle, sheep and goats.

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:

Mule deer and bighorn sheep generally use the blackbrush vegetation type in winter. The principal forage value of blackbrush appears to be as a browse species for bighorn sheep. In southern Nevada, blackbrush communities with an understory including big galleta are preferred cover for desert bighorn sheep. Blackbrush provides cover for nongame birds and small mammals. 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, pronghorn, small rodents, jackrabbits, game birds, and songbirds. Shadscale is good browse for mule deer, which feed upon shadscale during winter and spring. Although it is not preferred shadscale may provide winter forage for pronghorn. Shadscale habitats are important home ranges for small mammals. White bursage is an important browse species for wildlife. Mule deer, bighorn sheep, and pronghorn browse Nevada ephedra, especially in spring and late summer when new growth is available.

Hydrological functions

Permeability is moderately rapid and available water capacity is low to very low. Potential for sheet and rill erosion is slight to moderate. Runoff is medium to very high.

Other products

Historically, shadscale was a food source for Native Americans of the southwestern United States. Seeds were used by Native Americans of Arizona, Utah and Nevada for bread and mush.

Indian ricegrass seeds make a gluten-free, nutritious flour with a potentially good market. Indian ricegrass was traditionally eaten by some Native American people. The Paiutes used seed as a reserve food source. The large-seeded panicle is often used in dry floral arrangements.

Other information

Blackbrush contributes to desert fertility by protecting the soil against wind erosion through retarding the movement of soil and increasing the accumulation of fine soil particles around its base. Blackbrush protects under story vegetation from the effects of high temperatures, thereby helping to retain surface nitrogen and adding organic matter to the soil. Blackbrush also serves as a nitrogen reservoir through the storage of nitrogen in roots, leaves, and stems. Revegetation of desert communities is inherently difficult. Dry soil surfaces resulting from low humidity, high irradiation, and moderate to strong winds are major obstacles in revegetation projects. 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. Indian ricegrass is well suited for surface erosion control and desert revegetation although it is not highly effective in controlling sand movement. Certain native ecotypes exhibit desirable characteristics such as drought and salinity tolerance, low seed dormancy and good nutritional qualities.

Inventory data references

NV-ECS-1: 2 records

Type locality

Location 1: Clark County, NV	
Township/Range/Section	T23 S R60 E S31
General legal description	Low - lying hills just East of Bird Spring Range, Clark County, Nevada.

Other references

USDA-NRCS Plant Database (Online, <http://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	04/02/2014
Approved by	Kendra Moseley
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

Indicators

- 1. Number and extent of rills:** Rills are none to rare. A few can be expected on steeper slopes recently subjected to summer convection storms.

- 2. Presence of water flow patterns:** Waterflow patterns are rare but can be expected in areas recently subjected to summer convection storms, usually on steeper slopes. Water flow patterns are short (<1 m) and stable.

- 3. Number and height of erosional pedestals or terracettes:** Pedestals are rare. Occurrence is usually limited to areas of waterflow patterns.

- 4. Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):** Bare Ground 15-25%

- 5. Number of gullies and erosion associated with gullies:** Typically gullies are non-existent. If present, they are well-vegetated and stable,

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

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 3 to 6 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 thick platy structure. Soil surface colors are pale browns 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 subangular blocky structure is 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: Evergreen shrubs (blackbrush)
- Sub-dominant: deciduous shrubs >> deep-rooted, cool-season, bunchgrasses > warm season, perennial bunchgrass = perennial forbs = annual forbs
- Other: succulents
- 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):** Between plant interspaces up to 20%; Depth <1/4 inch
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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 350 lbs/ac. Favorable production 450 lbs/ac and unfavorable production 275 lbs/ac.

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: Potential invaders include Red brome, red-stem filaree, annual mustards, and Mediterranean grass.

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 during drought years.
