USDA Natural Resources
Conservation Service

Ecological site R030XA067NV
LIMY HILL 3-5 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 and lower mountain sideslopes on all exposures. Slopes range from 8 to 75 percent, but slope gradients of 15 to 50 percent are typical. Elevations are 1000 to about 4000 feet.The soil associated with this site are shallow, and have formed in residuum and colluvium derived from mixed parent material. The soils are typically calcareous to the surface.

Please refer to group concept R030XB127NV to view the provisional STM.

Associated sites

R030XA054NV	**Limy Hill 5-7 P.Z.**
R030XA058NV	**LIMY 5-7 P.Z.**
R030XA073NV	**LIMY 3-5 PZ**

Similar sites

R030XB054NV	**SANDY 3-5 P.Z.** More productive site
R030XB073NV	**VOLCANIC SLOPE 5-7 P.Z.** Not on hill landform; LEFR2 major shrub
R030XA058NV	**LIMY 5-7 P.Z.** More productive site; not on hill landform
R030XA059NV	**GRAVELLY HILL 5-7 P.Z.** ATCO codominant shrub

Table 1. Dominant plant species

Tree	Not specified
Shrub	(1) *Larrea tridentata* (2) *Ambrosia dumosa*
Herbaceous	Not specified

Physiographic features

This site occurs on hills and lower mountain sideslopes on all exposures. Slopes range from 8 to 75 percent, but slope gradients of 15 to 50 percent are typical. Elevations are 1000 to about 4000 feet.

Table 2. Representative physiographic features

Landforms	(1) Hill (2) Mountain slope
Elevation	1,000–4,000 ft
Slope	8–75%

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 about 3 to 5 inches. Mean annual air temperature is 64 to 72 degrees F. The average growing season is about 240 to 290 days.

Table 3. Representative climatic features

Frost-free period (average)	290 days
Freeze-free period (average)	
Precipitation total (average)	5 in

Influencing water features

There are no influencing water features associated with this site.

Soil features

The soil associated with this site are shallow, and have formed in residuum and colluvium derived from mixed parent material. The soils are typically calcareous to the surface. Surface soils have high amounts of gravel, cobbles, or stones. The water intake rate is rapid and available water capacity is low. Runoff is rapid and these soils are well drained.

Table 4. Representative soil features

Drainage class	Well drained

Ecological dynamics

Please refer to group concept R030XB127NV to view the provisional STM.

As ecological condition deteriorates, creosotebush, snakeweed, and white burrobrush increase. Species likely to invade this site are annual forbs and grasses such filaree and red brome.

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. 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. White burrobrush establishes after fire via off-site seeds and sprouting. Because it seeds prolifically, white burrobrush can quickly colonize burned sites.

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 creosotebush and white bursage. Potential vegetative composition is about 10% grasses, 10% forbs and 80% shrubs. Approximate ground cover (basal and crown) is 2 to 5 percent.

Table 5. Annual production by plant type

Plant Type	Low (Lb/Acre)	Representative Value (Lb/Acre)	High (Lb/Acre)
Shrub/Vine	20	60	100
Grass/Grasslike	3	8	13
Forb	2	7	12
Total	**25**	**75**	**125**

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**			1–8	
	Indian ricegrass	ACHY	*Achnatherum hymenoides*	0–4	–
	desert needlegrass	ACSP12	*Achnatherum speciosum*	0–4	–
	low woollygrass	DAPU7	*Dasyochloa pulchella*	0–4	–
2	**Annual Grasses**			1–8	
Forb					
3	**Perennial forbs**			1–8	
	globemallow	SPHAE	*Sphaeralcea*	0–4	–
4	**Annual forbs**			1–8	
	plantain	PLANT	*Plantago*	0–4	–
Shrub/Vine					
5	**Primary shrubs**			31–61	
	creosote bush	LATR2	*Larrea tridentata*	19–34	–
	burrobush	AMDU2	*Ambrosia dumosa*	8–19	–
	burrobrush	HYSA	*Hymenoclea salsola*	4–8	–
6	**Secondary shrubs**			8–19	
	shadscale saltbush	ATCO	*Atriplex confertifolia*	1–4	–
	Nevada jointfir	EPNE	*Ephedra nevadensis*	1–4	–
	snakeweed	GUTIE	*Gutierrezia*	1–4	–
	desert pepperweed	LEFR2	*Lepidium fremontii*	1–4	–
	pricklypear	OPUNT	*Opuntia*	1–4	–

Animal community

Livestock Interpretations:
This site has limited value for livestock grazing, due to the low forage production, steep slopes and stony surfaces. Creosotebush is unpalatable to livestock. Consumption of creosotebush may be fatal to 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.

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:
Creosotebush is unpalatable to most browsing wildlife. White bursage is an important browse species for wildlife.

Hydrological functions

The water intake rate is rapid and available water capacity is low. Runoff is rapid and these soils are well drained.

Other products

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. White bursage is a host for sandfood, a parasitic plant. Sandfood was a valuable food supply for Native Americans. Native Americans used white burrobrush twigs and stems in several remedies. The

twigs or leaves are mixed with all-thorn twigs, boiled, and the tea taken to treat skin rashes. The tea was used to relieve pain in the lungs and trachea, and to reduce swelling. Additionally, they use white burrobrush as a remedy for rheumatism.

Other information

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

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

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Approval

Kendra Moseley, 2/18/2025

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)	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 few. Few can be expected on steeper slopes after summer convection storms.

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2. **Presence of water flow patterns:** Water flow patterns none to few. Few can be expected on steeper slopes after summer convection storms. Flow patterns are short (<1 m) and stable.

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3. **Number and height of erosional pedestals or terracettes:** Pedestals are rare with occurrence typically limited to areas within water flow patterns.

4. **Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):** Bare Ground to 80%; surface rock fragments to 35%; shrub canopy <10%; basal area for perennial herbaceous plants (Trace)

5. **Number of gullies and erosion associated with gullies:** Gullies are typically none. Natural drainages are stable and well vegetated.

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.

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 2 to 4 on most soil textures found on this site.

9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** Surface structure is typically moderate thick platy. Soil surface colors are pale browns and soils are typified by an ochric epipedon. Organic matter of the surface 2 to 3 inches is less than 1 percent.

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.

11. **Presence and thickness of compaction layer (usually none; describe soil profile features which may be mistaken for compaction on this site):** None. Subangular blocky structure is not to be interpreted as compacted layers.

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: tall evergreen shrubs (creosote bush) > deciduous shrubs

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

    Other: succulents

    Additional:

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 35% of total woody canopy; mature bunchgrasses commonly (±25%) have dead centers.

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14. **Average percent litter cover (%) and depth (in):** Between plant interspaces (Trace – 5%)

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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 ± 75 lbs/ac; Favorable years: 125 lbs/ac; Unfavorable years 25 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:** Potential invaders include red brome, redstem filaree, Mediterranean grass and annual mustards.

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17. **Perennial plant reproductive capability:** All functional groups should reproduce in above average growing season years. Little growth or reproduction occurs during extreme or extended drought periods.
