USDA Natural Resources
Conservation Service

Ecological site R030XB212AZ
Limy Slopes 6-9" p.z.

Last updated: 10/21/2024
Accessed: 05/20/2025

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.

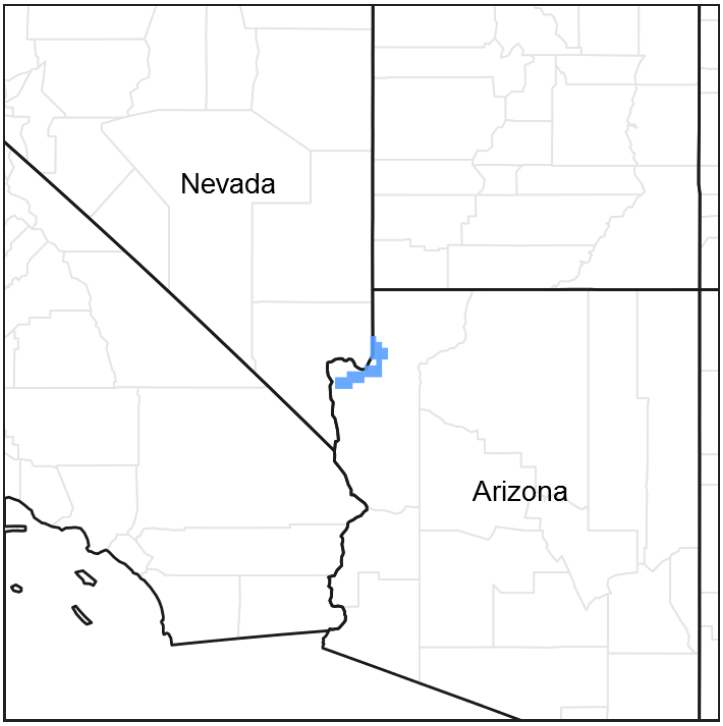


Figure 1. Mapped extent

Areas shown in blue indicate the maximum mapped extent of this ecological site. Other ecological sites likely occur within the highlighted areas. It is also possible for this ecological site to occur outside of highlighted areas if detailed soil survey has not been completed or recently updated.

MLRA notes

Major Land Resource Area (MLRA): 030X–Mojave Basin and Range

This unit occurs within the Basin and Range Province and is characterized by broad basins, valleys, and old lakebeds. Widely spaced mountains trending north to south occur

throughout the area. Isolated, short mountain ranges are separated by an aggraded desert plain. The mountains are fault blocks that have been tilted up. Long alluvial fans coalesce with dry lakebeds between some of the ranges.

LRU notes

AZ LRU 30-2 – Middle Mohave Desert

Elevations range from 1500 to 3200 feet and precipitation averages 6 to 9 inches per year. Vegetation includes creosotebush, white bursage, yucca, prickly pear and cholla species, Mormon tea, flattop buckwheat, ratany, winterfat, bush muhly, threeawns, and big galleta. The soil temperature regime is thermic and the soil moisture regime is typic aridic.

Ecological site concept

This ecological site is located on steeply sloping uplands (slopes 15% - 65%). Calcareous soils are moderately deep to deep, yet shallow to petrocalcic horizon.

Associated sites

R030XA107AZ	**Limy Slopes 3-6" p.z.**
R030XB211AZ	**Limy Fan 6-9" p.z.**

Table 1. Dominant plant species

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

Physiographic features

This desert shrub ecological site is in an upland position of narrow, sloping, inter-locking ridges with steep sides. It does not receive any benefit from run-on moisture, but excessive runoff can occur because of steep slopes. Cooler aspects are more productive with closer plant spacing and growthier shrubs. It is found on all aspects.

Table 2. Representative physiographic features

Landforms	(1) Ballena (2) Fan (3) Terrace
Flooding frequency	None

Ponding frequency	None
Elevation	488–914 m
Slope	15–50%

Climatic features

The climate is arid and warm. Annual precipitation ranges from 6 to 9 inches. About 65 percent of the rainfall comes from October through May as gentle rain from Pacific storms which may last for a couple of days. The rest of the rainfall comes during the summer monsoon season from July through September as spotty, brief, intense thunderstorms. Snow rarely falls, and only remains on the ground a few hours at most. Annual air temperature ranges from 59 to 70 degrees F. The average frost-free period ranges from 156 to 259 days.

Table 3. Representative climatic features

Frost-free period (average)	259 days
Freeze-free period (average)	290 days
Precipitation total (average)	229 mm

Influencing water features

Soil features

The soil of this ecological site is moderately deep to any plant root restricting layer. The soil is strongly to violently effervescent throughout the soil profile. The soil's moisture regime is typic aridic and the temperature regime is thermic. The soil is well drained, non-saline and non-sodic with a pH range of 8.0-8.6. The soil's water erosion hazard is moderate and wind erosion hazard is slight. The pLant-soil moisture relationship is limited due to shallow soils, gravel and lime content.

A typical soil profile is:
A-0 to 2 inches; extremely gravelly sandy loam; 65 percent gravel; strongly effervescent
Bw1-2 to 8 inches; gravelly sandy clay loam; 30 percent gravel; strongly effervescent
Bw2-8 to 17 inches; extremely gravelly sandy clay loam; 75 percent gravel; strongly effervescent
Bk-17 to 27 inches; extremely gravelly sandy clay loam; 80 percent gravel; strongly effervescent
Cr-27 inches; weathered fanglomerate dominated by granite, schist and gneiss clasts

The taxonomic classification is Loamy-skeletal, mixed, superactive, thermic Typic

Haplocambids

Soils correlated to this ecological site include map units 701012 and 102013, Bobzbulz soil, 701087, Meadview soil, and 701086 and 701087, Orrubo soil in the Grand Canyon Area, AZ, Parts of Coconino and Mohave Counties.

Table 4. Representative soil features

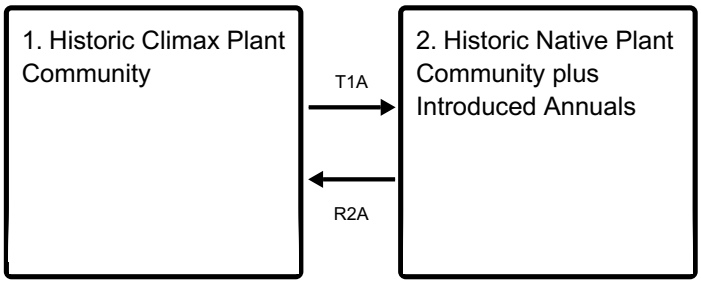
Surface texture	(1) Very gravelly sandy loam (2) Extremely gravelly loam (3) Clay
Family particle size	(1) Loamy
Drainage class	Well drained
Permeability class	Moderate
Soil depth	33–61 cm
Surface fragment cover <=3"	35–45%
Surface fragment cover >3"	5–20%
Available water capacity (0-101.6cm)	2.54–7.62 cm
Calcium carbonate equivalent (0-101.6cm)	15–35%
Electrical conductivity (0-101.6cm)	0–4 mmhos/cm
Sodium adsorption ratio (0-101.6cm)	0
Soil reaction (1:1 water) (0-101.6cm)	7.9–9
Subsurface fragment volume <=3" (Depth not specified)	40–70%
Subsurface fragment volume >3" (Depth not specified)	10–25%

Ecological dynamics

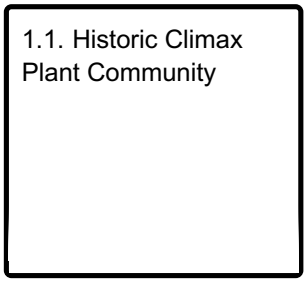
Limy Slopes, 6'-9" p.z., is a widely dispersed desert shrubland. Natural disturbances are rare. After introduction of non-native annuals (forbs and/or grasses), the shift in total productivity with shift slightly toward seasonal herbaceous production following periods of rain. Livestock and wildlife use are limited on this site due steep slopes, low and dispersed forage production. Dominant shrubs are creosote and white bursage. Assorted half-shrubs are widely scattered.

State and transition model

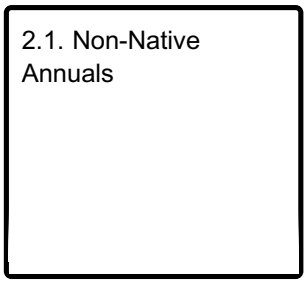
Ecosystem states



State 1 submodel, plant communities



State 2 submodel, plant communities



State 1
Historic Climax Plant Community

Community 1.1
Historic Climax Plant Community

The plant community of this state of the ecological site is a mixed desert shrub site with white bursage and creosote bush as the dominant species. There is a lesser, but significant amount, of white ratany. Fremont dalea and ephedra. Very little perennial grasses occur; perennial forbs desert globemallow and desert trumpet are usually present. During years of average or below precipitation, the herbage production is mainly from shrubs, while the annual grass and forb content is relatively small. In unusually wet years, the annual and perennial forb production may equal that of the shrubs. Some species of annuals are only seen in wet years. Typical perennial plant spacing is 2.0-2.75 feet.

Table 5. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Shrub/Vine	103	179	336
Forb	8	28	75
Grass/Grasslike	1	17	37
Total	**112**	**224**	**448**

Figure 5. Plant community growth curve (percent production by month). AZ3022, 30.2 6-9" p.z. upland sites. Growth begins in the late winter, most growth occurs in the spring..

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	2	19	33	18	7	7	11	3	0	0	0

State 2
Historic Native Plant Community plus Introduced Annuals

Community 2.1
Non-Native Annuals

This plant community resembles the historic native plant community, but exotic annuals have been introduced. Non-native species include red brome, Mediterranean grass (Schismus spp.), and filaree. The flourish of non-native annuals that occurs following rainfalls may preclude native annuals.

Transition T1A
State 1 to 2

Introduction of non-native annual forb and grass seed.

Restoration pathway R2A
State 2 to 1

None known.

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				2–11	
	threeawn	ARIST	*Aristida*	2–9	

	threeawn	ARIST	*Aristida*	2–9	–
	big galleta	PLRI3	*Pleuraphis rigida*	2–9	–
2				0–4	
	Grass, perennial	2GP	*Grass, perennial*	0–2	–
	desert needlegrass	ACSP12	*Achnatherum speciosum*	0–2	–
	low woollygrass	DAPU7	*Dasyochloa pulchella*	0–2	–
	bush muhly	MUPO2	*Muhlenbergia porteri*	0–2	–
	sand dropseed	SPCR	*Sporobolus cryptandrus*	0–2	–
	tridens	TRIDE	*Tridens*	0–2	–
3				0–11	
	Grass, annual	2GA	*Grass, annual*	0–11	–
Forb					
4				2–11	
	desert globemallow	SPAM2	*Sphaeralcea ambigua*	2–11	–
5				2–11	
	desert trumpet	ERIN4	*Eriogonum inflatum*	2–11	–
6				0–2	
	Forb, perennial	2FP	*Forb, perennial*	0–1	–
	trailing windmills	ALIN	*Allionia incarnata*	0–1	–
	desert marigold	BAMU	*Baileya multiradiata*	0–1	–
	sego lily	CANU3	*Calochortus nuttallii*	0–1	–
	brownplume wirelettuce	STPA4	*Stephanomeria pauciflora*	0–1	–
7				2–22	
	Forb, annual	2FA	*Forb, annual*	0–4	–
	mustard	BRASS2	*Brassica*	0–4	–
	cryptantha	CRYPT	*Cryptantha*	0–4	–
	dyssodia	DYSSO	*Dyssodia*	0–4	–
	buckwheat	ERIOG	*Eriogonum*	0–4	–
	beardtongue	PENST	*Penstemon*	0–4	–
	phacelia	PHACE	*Phacelia*	0–4	–
	Ives' phacelia	PHIVP	*Phacelia ivesiana var. pediculoides*	0–4	–
	desert	PLOV	*Plantago ovata*	0–4	–

	Indianwheat				
	primrose	PRIMU	*Primula*	0–4	–
	woolly tidestromia	TILA2	*Tidestromia lanuginosa*	0–4	–
Shrub/Vine					
8				56–90	
	burrobush	AMDU2	*Ambrosia dumosa*	56–90	–
9				34–67	
	creosote bush	LATR2	*Larrea tridentata*	34–67	–
10				22–45	
	Torrey's jointfir	EPTO	*Ephedra torreyana*	11–22	–
	white ratany	KRGR	*Krameria grayi*	11–22	–
	Fremont's dalea	PSFR	*Psorothamnus fremontii*	11–22	–
11				2–11	
	staghorn cholla	CYVE3	*Cylindropuntia versicolor*	2–6	–
	echinocactus	ECHIN2	*Echinocactus*	2–6	–
	hedgehog cactus	ECHIN3	*Echinocereus*	2–6	–
	beavertail pricklypear	OPBA2	*Opuntia basilaris*	2–6	–
12				0–4	
	Joshua tree	YUBR	*Yucca brevifolia*	0–4	–
	Mojave yucca	YUSC2	*Yucca schidigera*	0–4	–
13				2–7	
	Shrub, other	2S	*Shrub, other*	0–3	–
	catclaw acacia	ACGR	*Acacia greggii*	0–3	–
	rayless goldenhead	ACSP	*Acamptopappus sphaerocephalus*	0–3	–
	beehive cactus	CORYP	*Coryphantha*	0–3	–
	brittlebush	ENFA	*Encelia farinosa*	0–3	–
	button brittlebush	ENFR	*Encelia frutescens*	0–3	–
	mormon tea	EPVI	*Ephedra viridis*	0–3	–
	ocotillo	FOSP2	*Fouquieria splendens*	0–3	–
	broom snakeweed	GUSA2	*Gutierrezia sarothrae*	0–3	–
	burrobrush	HYSA	*Hymenoclea salsola*	0–3	–
	littleleaf ratany	KRER	*Krameria erecta*	0–3	–

	winterfat	KRLA2	*Krascheninnikovia lanata*	0–3	–
	woody crinklemat	TICA3	*Tiquilia canescens*	0–3	–

Recreational uses

Hiking, hunting, wildlife observation and photography.

Contributors

Larry D. Ellicott

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)	
Contact for lead author	
Date	05/20/2025
Approved by	Kendra Moseley
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:**

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

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5. **Number of gullies and erosion associated with gullies:**

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6. **Extent of wind scoured, blowouts and/or depositional areas:**

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7. **Amount of litter movement (describe size and distance expected to travel):**

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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):**

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9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):**

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10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:**

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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):**

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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:

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:**
