USDA Natural Resources Conservation Service

Ecological site R030XA108AZ
Limy Upland 3-6" p.z.

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

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.

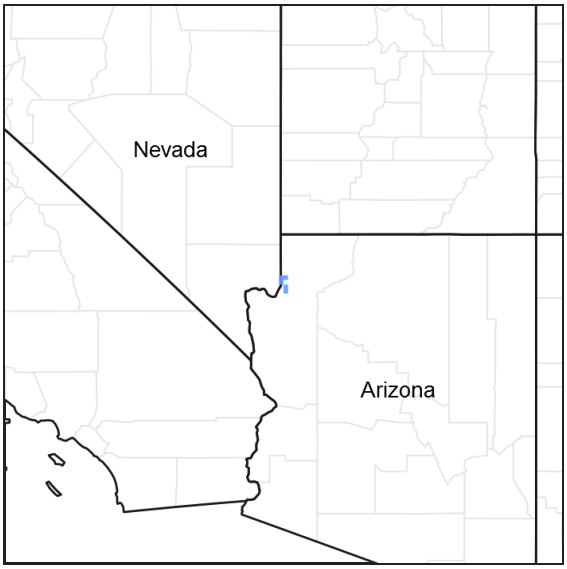


Figure 1. Mapped extent

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 30-1, Lower Mohave Desert

Elevations range from 400 to 2500 feet and precipitation averages 3 to 6 inches per year. Vegetation includes creosotebush, white bursage, Mormon tea, and brittlebush. The soil temperature regime is hyperthermic and the soil moisture regime is typic aridic.

Ecological site concept

Limy Upland, 3"-6" p.z, ecological site is found on gently sloping uplands. The calcareous soils are shallow to a petrocalcic horizon or bedrock.

Associated sites

R030XA109AZ	**Limy Upland 3-6" p.z. Deep**

Table 1. Dominant plant species

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

Physiographic features

This ecological site occurs in an upland position. It is composed of broken rolling hills dissected by numerous desert washes.

It does not benefit significantly from run-in moisture from adjacent areas, but it does suffer from excessive loss from runoff. It occurs on all exposures. Slope ranges from 2 to 18 percent. It usually occurs on terraces along the Colorado River. Elevation ranges from 500 to 1,500 feet above sea level.

Table 2. Representative physiographic features

Landforms	(1) Hill
Aspect	Aspect is not a significant factor

Climatic features

The 30-1AZ Lower Mohave Desert Shrub land resource unit is characterized by a hot, dry climate. The average annual rainfall is 3 to 6 inches, but it can be extremely variable (e.g. from 0 to 11 inches). There can be long periods when little or no precipitation is received. Most of the precipitation for the year could arrive in just a couple of storms. The soil moisture regime is typic aridic and the soil temperature regime is hyperthermic. Winter precipitation from November through April occurs as gentle rains from storms coming out of the Pacific Ocean. Snow is very rare and only falls in the highest mountains. A seasonal drought occurs in May and June. Summer/fall precipitation from July through October comes from spotty, unreliable, and sometimes violent thunderstorms. The moisture originates in the Gulf of Mexico (and the Pacific Ocean in the fall) and flows into the state on the north end of the Mexican monsoon. Strong winds are common, especially during the spring.

Table 3. Representative climatic features

Frost-free period (average)	325 days
Freeze-free period (average)	365 days
Precipitation total (average)	6 in

Influencing water features

Soil features

The soils characterizing this site are shallow to moderately deep to a layer high in lime content. The surface soil ranges in depth from 2 to 6 inches and ranges in texture from gravelly loam to very gravelly loam to gravelly sandy loam. The subsoil and underlying layers have permeabilities ranging from moderate to moderately slow, but can absorb and hold all the moisture the climate supplies, provided that this moisture is retained on the soil to allow penetration. Soluble salt accumulations are low and pH ranges from 7.9 to 8.4. With good vegetational cover infiltration rates are moderate. Stability against erosion processes is poor and plant-soil-moisture relationships are less than average. Coarse fragments average 50 to 60 percent of the total soil volume.

A typical soil profile is:
0 to 2 inches; very gravelly sandy loam
2 to 6 inches; calcareous very gravelly sandy clay loam
9 to 60 inches; indurated, lime-cemented hardpan

Soils correlated to this ecological site include 701096, Pompeii Family soil, Grand Canyon Area, Arizona, Parts of Coconino and Mohave Counties SSA.

Table 4. Representative soil features

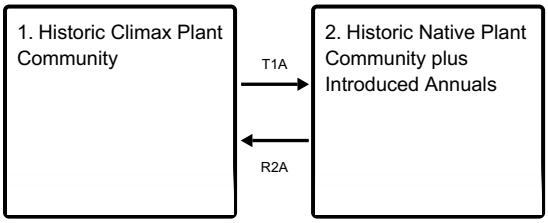
Surface texture	(1) Gravelly sandy loam (2) Gravelly loam (3) Very gravelly loam
Family particle size	(1) Loamy
Drainage class	Well drained
Permeability class	Moderately slow to moderate
Soil depth	9–40 in
Surface fragment cover <=3"	40–50%
Surface fragment cover >3"	0–15%
Available water capacity (0-40in)	0.7 in
Calcium carbonate equivalent (0-40in)	2–10%
Electrical conductivity (0-40in)	0–2 mmhos/cm
Sodium adsorption ratio (0-40in)	13
Soil reaction (1:1 water) (0-40in)	7.9–8.4
Subsurface fragment volume <=3" (Depth not specified)	40–50%
Subsurface fragment volume >3" (Depth not specified)	0–15%

Ecological dynamics

The plant community on this site is shrub dominated with a very sparse understory of perennial grasses and perennial forbs. Limited natural disturbance occurs on this site. Limited available forage is makes this site less preferred by livestock compared to adjacent sites. Annual forbs flourish in springs, particularly following wet winters; the green forage produced is desired by livestock but is largely unused once matured. Non-native annuals are well adapted on this site.

State and transition model

Ecosystem states



State 1 submodel, plant communities

1.1. Historic Climax Plant Community

State 2 submodel, plant communities

2.1. Non-native Annuals

State 1
Historic Climax Plant Community

Community 1.1
Historic Climax Plant Community

The climax perennial plant community on this site is dominately shrubby, with only a small amount of grass. In years of favorable moisture a good crop of highly palatable annuals can be produced.

Table 5. Annual production by plant type

Plant Type	Low (Lb/Acre)	Representative Value (Lb/Acre)	High (Lb/Acre)
Shrub/Vine	225	235	255
Forb	30	40	75
Grass/Grasslike	15	25	45
Total	**270**	**300**	**375**

Figure 4. Plant community growth curve (percent production by month). AZ3011, 30.1 3-6" p.z. all sites. Growth begins in late winter, most growth occurs in the spring..

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	7	30	32	13	7	3	5	2	1	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 (Lb/Acre)	Foliar Cover (%)
Grass/Grasslike					
1	**Perennial Grasses**			15–30	
	bush muhly	MUPO2	*Muhlenbergia porteri*	15–30	–
	threeawn	ARIST	*Aristida*	0–15	–
	low woollygrass	DAPU7	*Dasyochloa pulchella*	0–15	–
2	**Native Annual Grasses**			3–15	
	sixweeks threeawn	ARAD	*Aristida adscensionis*	0–15	–
	needle grama	BOAR	*Bouteloua aristidoides*	0–15	–
	sixweeks grama	BOBA2	*Bouteloua barbata*	0–15	–
Forb					
3	**Forbs**			30–75	
	Forb, annual	2FA	*Forb, annual*	0–15	–
	desert marigold	BAMU	*Baileya multiradiata*	0–15	–
	devil's spineflower	CHRI	*Chorizanthe rigida*	0–15	–
	buckwheat	ERIOG	*Eriogonum*	0–15	–
	spurge	EUPHO	*Euphorbia*	0–15	–
	evening primrose	OENOT	*Oenothera*	0–15	–
	plantain	PLANT	*Plantago*	0–15	–
	Coulter's globemallow	SPCO2	*Sphaeralcea coulteri*	0–15	–
Shrub/Vine					
4				135–180	
	creosote bush	LATR2	*Larrea tridentata*	135–180	–
5				45–60	
	brittlebush	ENCEL	*Encelia*	45–60	–
6				30–60	
	button brittlebush	ENFR	*Encelia frutescens*	30–60	–
7				15–60	
	burrobush	AMDU2	*Ambrosia dumosa*	15–60	–
8				3–15	
	ratany	KRAME	*Krameria*	3–15	–
9				0–15	
	desert-thorn	LYCIU	*Lycium*	0–15	–
	yellow paloverde	PAMI5	*Parkinsonia microphylla*	0–15	–
10				3–15	
	pricklypear	OPUNT	*Opuntia*	3–15	–

Contributors

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Unknown

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	05/10/2025
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:**

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):**

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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:**
