

Ecological site R030XC311AZ Limy Upland 10-13" 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.

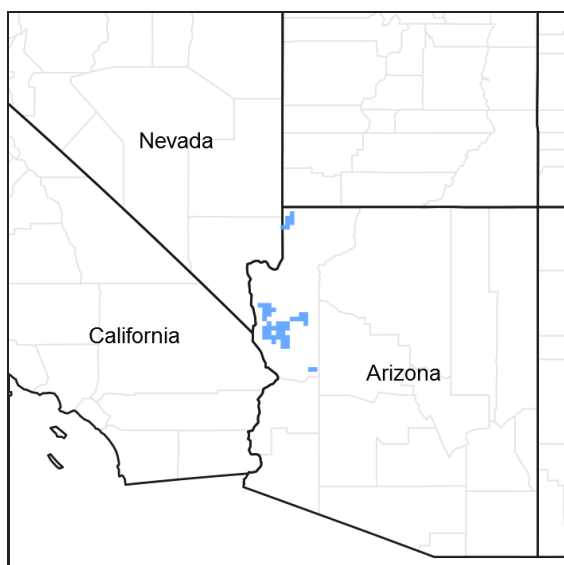


Figure 1. Mapped extent

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 30-3 – Upper Mohave Desert

Elevations range from 2800 to 4500 feet and precipitation averages 9 to 12 inches per year. Vegetation includes Joshua tree, blackbrush, creosotebush, ratany, bush muhly, big galleta, black grama, desert needlegrass, and Indian ricegrass. The soil temperature regime is thermic and the soil moisture regime is typical aridic.

Ecological site concept

This ecological site is located on gently sloping uplands. Soils are calcareous, very shallow to shallow, over a lime cemented hardpan.

Associated sites

R030XC306AZ	Granitic Hills 10-13" p.z. Alkaline
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Table 1. Dominant plant species

Tree	Not specified
Shrub	(1) <i>Larrea tridentata</i> (2) <i>Yucca schidigera</i>
Herbaceous	(1) <i>Pleuraphis rigida</i>

Physiographic features

This ecological site is found in an upland position on shoulders, ridges, and summits of fan terraces, mesas and plateaus.

Table 2. Representative physiographic features

Landforms	(1) Plateau (2) Terrace (3) Mesa
Flooding frequency	None
Ponding frequency	None
Elevation	671–1,219 m
Slope	1–25%
Aspect	Aspect is not a significant factor

Climatic features

The climate is arid and warm. Annual precipitation ranges from 10 to 13 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 46 to 76 degrees F. The average frost-free period ranges from 121 to 231 days.

Table 3. Representative climatic features

Frost-free period (average)	231 days
Freeze-free period (average)	269 days
Precipitation total (average)	330 mm

Influencing water features

Soil features

The soil of this ecological site is moderately deep with surface textures of cobbly loam, extremely gravelly loam, very gravelly sandy loam, or very cobbly loam. Subsurface textures are gravelly loam, gravelly clay loam, very gravelly loam, loam, very gravelly sandy loam, very gravelly fine sandy loam and very stony loam. The soil's parent material is alluvium from sedimentary, igneous and metamorphic rocks. The available water capacity of the soil is very low to low. Erosion hazard by water is slight to severe and by wind is slight. The soil is non-saline, non-sodic with pH range of 8.0-8.4 (moderately alkaline). The soil moisture regime is typic aridic and soil temperature regime is thermic.

A lime cemented hardpan is found at depth ranges from 15-32 inches. Lime content above the hardpan is 15-35% calcium carbonate equivalent.

A typical soil profile is:

0 to 1 inch; very cobbly loam

1 to 8 inches; calcareous very gravelly loam

8 to 49 inches; calcareous very stony loam

49 inches; weathered gneiss

The taxonomic classification of the soil includes Loamy-skeletal, mixed, thermic Typic Calciorthids.

Soil mapping units correlated to this ecological site include So. Mohave SSA: Goodspring, Alko and Castaneda; Central Mohave SSA: Shamrock, Nealy and Whitehills; and Shivwits SSA: Hobog, Tidwell and Nickel family.

Table 4. Representative soil features

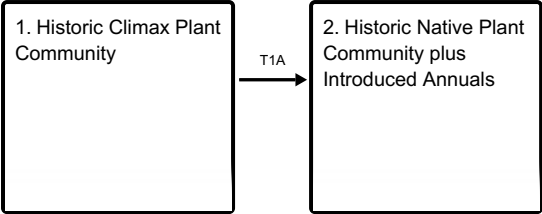
Parent material	(1) Alluvium–metasedimentary rock
Surface texture	(1) Gravelly loam (2) Very gravelly sandy loam (3) Very stony clay loam
Family particle size	(1) Loamy
Drainage class	Well drained
Permeability class	Moderately slow to moderately rapid
Soil depth	51–102 cm
Surface fragment cover <=3"	30–50%
Surface fragment cover >3"	20–50%
Available water capacity (0-101.6cm)	6.35–10.16 cm
Calcium carbonate equivalent (0-101.6cm)	3–15%
Electrical conductivity (0-101.6cm)	0–4 mmhos/cm
Sodium adsorption ratio (0-101.6cm)	0
Soil reaction (1:1 water) (0-101.6cm)	7.9–8.4
Subsurface fragment volume <=3" (Depth not specified)	45–60%
Subsurface fragment volume >3" (Depth not specified)	5–20%

Ecological dynamics

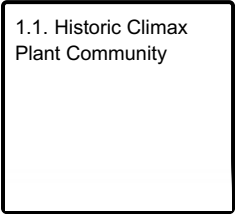
Limy Upland, 10"-13" p.z., is a shrub dominated ecological site. Sparse perennial grasses and forbs are occasionally encountered. Annual forbs and grasses flourish following rainfall. Natural disturbances are rare. After introduction of non-native annuals (forbs and/or grasses), the shift in total productivity is shift increased seasonal herbaceous production following periods of rain. Dominant shrubs are creosote and white bursage. Assorted half-shrubs are widely scattered.

State and transition model

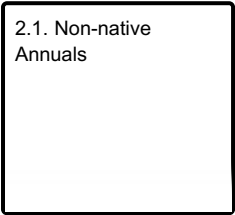
Ecosystem states



State 1 submodel, plant communities



State 2 submodel, plant communities



State 1
Historic Climax Plant Community

Community 1.1
Historic Climax Plant Community

The dominant aspect of this plant community is a desert shrub with an understory of grasses. Forbs are present in minor amounts. Major shrubs include creosotebush, Mohave yucca, white bursage, rayless goldenhead and Anderson wolfberry. Blackbush occurs in some areas. Grasses include big galleta, bush muhly and annual grasses.

Table 5. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Shrub/Vine	65	206	334
Grass/Grasslike	40	129	223
Forb	7	28	55
Tree	—	1	4
Total	112	364	616

Table 6. Ground cover

Tree foliar cover	0%
Shrub/vine/liana foliar cover	1-3%
Grass/grasslike foliar cover	0-2%
Forb foliar cover	0%
Non-vascular plants	0%
Biological crusts	0%
Litter	0%
Surface fragments >0.25" and <=3"	0%

Surface fragments >3"	0%
Bedrock	0%
Water	0%
Bare ground	0%

Table 7. Canopy structure (% cover)

Height Above Ground (M)	Tree	Shrub/Vine	Grass/Grasslike	Forb
<0.15	–	–	–	0-2%
>0.15 <= 0.3	–	–	1-3%	–
>0.3 <= 0.6	–	–	–	–
>0.6 <= 1.4	–	9-11%	–	–
>1.4 <= 4	0-2%	–	–	–
>4 <= 12	–	–	–	–
>12 <= 24	–	–	–	–
>24 <= 37	–	–	–	–
>37	–	–	–	–

Figure 5. Plant community growth curve (percent production by month). AZ3024, 30.3 10-13" p.z. upland sites. Growth begins in the spring and continues through the summer..

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	1	8	18	18	11	14	20	8	2	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.

Additional community tables

Table 8. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Kg/Hectare)	Foliar Cover (%)
Grass/Grasslike					
1				36–55	
	big galleta	PLRI3	<i>Pleuraphis rigida</i>	36–55	–
2				3–18	
	bush muhly	MUPO2	<i>Muhlenbergia porteri</i>	3–18	–
3				3–11	

	low woollygrass	DAPU7	<i>Dasyochloa pulchella</i>	3–11	–
4				3–11	
	Indian ricegrass	ACHY	<i>Achnatherum hymenoides</i>	3–11	–
5				4–18	
	Grass, perennial	2GP	<i>Grass, perennial</i>	3–18	–
6				18–36	
	Grass, annual	2GA	<i>Grass, annual</i>	18–36	–
Forb					
7				3–7	
	desert trumpet	ERIN4	<i>Eriogonum inflatum</i>	3–7	–
8				3–11	
	Forb, perennial	2FP	<i>Forb, perennial</i>	3–11	–
9				3–18	
	Forb, annual	2FA	<i>Forb, annual</i>	3–18	–
Shrub/Vine					
10				36–55	
	creosote bush	LATR2	<i>Larrea tridentata</i>	36–55	–
11				0–36	
	burrobush	AMDU2	<i>Ambrosia dumosa</i>	0–36	–
12				18–36	
	Mojave yucca	YUSC2	<i>Yucca schidigera</i>	18–36	–
13				3–18	
	littleleaf ratany	KRER	<i>Krameria erecta</i>	0–18	–
	white ratany	KRGR	<i>Krameria grayi</i>	0–18	–
14				18–36	
	rayless goldenhead	ACSP	<i>Acamptopappus sphaerocephalus</i>	18–36	–
15				3–18	
	Nevada jointfir	EPNE	<i>Ephedra nevadensis</i>	3–18	–
16				0–11	
	banana yucca	YUBA	<i>Yucca baccata</i>	0–11	–
17				3–11	
	broom snakeweed	GUSA2	<i>Gutierrezia sarothrae</i>	3–11	–
18				3–18	
	Mexican bladdersage	SAME	<i>Salazaria mexicana</i>	3–18	–
19				0–36	
	blackbrush	CORA	<i>Coleogyne ramosissima</i>	0–36	–
20				3–18	
	water jacket	LYAN	<i>Lycium andersonii</i>	3–18	–
21				0–18	
	Eastern Mojave buckwheat	ERFAP	<i>Eriogonum fasciculatum</i> var. <i>polifolium</i>	0–18	–
22				18–36	
	Shrub, other	2S	<i>Shrub, other</i>	0–6	–
	buckhorn cholla	CYACA2	<i>Cylindropuntia acanthocarpa</i> var.	0–6	–

			<i>acanthocarpa</i>		
	kingcup cactus	ECTR	<i>Echinocereus triglochidiatus</i>	0–6	–
	ocotillo	FOSP2	<i>Fouquieria splendens</i>	0–6	–
	spiny hopsage	GRSP	<i>Grayia spinosa</i>	0–6	–
	burrobrush	HYSA	<i>Hymenoclea salsola</i>	0–6	–
	winterfat	KRLA2	<i>Krascheninnikovia lanata</i>	0–6	–
	whitestem paperflower	PSCO2	<i>Psilostrophe cooperi</i>	0–6	–
	woody crinklemat	TICAC	<i>Tiquilia canescens</i> var. <i>canescens</i>	0–6	–
Tree					
23				0–3	
	California juniper	JUCA7	<i>Juniperus californica</i>	0–3	–

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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	05/14/2025
Approved by	Kendra Moseley
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

Indicators

- Number and extent of rills:

- Presence of water flow patterns:

- 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):**
-
9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):**
-
10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:**
-
11. **Presence and thickness of compaction layer (usually none; describe soil profile features which may be mistaken for compaction on this site):**
-
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:
-
13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):**
-
14. **Average percent litter cover (%) and depth (in):**
-
15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):**

-
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:
-

17. **Perennial plant reproductive capability:**
-