USDA Natural Resources
Conservation Service

Ecological site R030XC318AZ
Sandy Loam Upland 10-13" p.z. Limy, Skeletal

Last updated: 10/21/2024
Accessed: 05/11/2025

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 30-3 – 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 typic aridic.

Ecological site concept

This ecological site is located on gently sloping uplands. Skeletal soils are calcareous, moderately deep to deep. Sub surface texture varies widely from loamy sand to clay.

Associated sites

R030XC324AZ	**Shallow Upland 10-13" p.z.**

Table 1. Dominant plant species

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

Physiographic features

This ecological site is found in an upland position on summits, shoulders, footslopes and backslopes of fan terraces and low hills. The soil of this ecological site is calcareous throughout the profile.

Table 2. Representative physiographic features

Landforms	(1) Terrace (2) Fan (3) Hill
Flooding frequency	None
Ponding frequency	None
Elevation	2,200–3,800 ft
Slope	2–30%
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)	13 in

Influencing water features

Soil features

The soil of this ecological site is shallow to very deep. Soil surface textures are gravelly sandy loam, very gravelly sandy loam, gravelly fine sandy loam, fine sandy loam and very gravelly loamy sand. Subsoil textures are gravelly sandy clay loam, gravelly sandy loam, very gravelly sandy loam, very gravelly loam, very gravelly sandy clay loam, very gravelly loamy sand, very gravelly sand, and extremely gravelly sandy loam. The soil parent material is alluvium and colluvium from sedimentary, granite and metamorphic rocks. The available water capacity is very low to moderate. The soil's erosion hazard by water is slight to moderate. The soil is non-saline, non-sodic with pH range of 7.8-8.4 (mildly to strongly alkaline). The soil moisture regime is typic aridic and temperature regime is

thermic. The soil surface has 30-40% gravel.

A typical soil profile is:
0 to 2 inches; very gravelly loamy sand
2 to 13 inches; calcareous very gravelly loamy sand
13 to 33 inches; calcareous very gravelly sand
33 to 60 inches; calcareous, stratified sand and gravel

Taxaomic classifications include Loamy-skeletal, mixed, thermic Typic Haplargids; Sandy-skeletal, mixed, thermic Typic Calciorthids; Coarse-loamy, mixed, thermic Typic Calciorthids; Sandy-skeletal, mixed, thermic Duric Calciorthids; Clayey-skeletal, smectitic, thermic Typic Argidurids; Loamy-skeletal, mixed, superactive, thermic, Typic Haplocambids; Fine-loamy, mixed, superactive, thermic Typic Argidurids; and Loamy-skeletal, mixed, superactive, thermic Typic Haplodurids.

Soil mapping units correlated to this ecological site are 697011, 697030, 697050, 697051, 697052, 697085, 697093, 697134, Detrital, Skelon family, Cyclopic, Meadview, and Nealy soils, Mohave County, AZ, Central Part and 623012, 623037, 623097, Blind, Grapevine, Meadview and Shelly soils, Shivwits Area SSA.

Table 4. Representative soil features

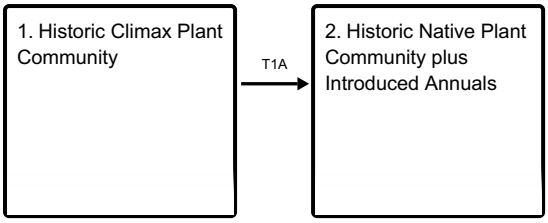
Parent material	(1) Alluvium–granite
Surface texture	(1) Gravelly sandy loam (2) Very gravelly fine sandy loam (3) Very gravelly loamy sand
Family particle size	(1) Loamy
Drainage class	Well drained to excessively drained
Permeability class	Moderately slow to very rapid
Soil depth	60 in
Surface fragment cover <=3"	45–65%
Surface fragment cover >3"	0–50%
Available water capacity (0-40in)	2.5–5 in
Calcium carbonate equivalent (0-40in)	3–15%
Electrical conductivity (0-40in)	0–2 mmhos/cm
Sodium adsorption ratio (0-40in)	0–13
Soil reaction (1:1 water) (0-40in)	7.4–8.4
Subsurface fragment volume <=3" (Depth not specified)	35–65%
Subsurface fragment volume >3" (Depth not specified)	0–50%

Ecological dynamics

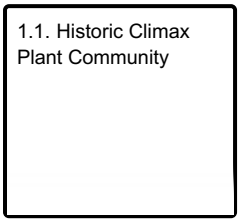
Sandy Loamy Upland, Limy, Skeletal, 10"-13" p.z., is a shrub dominated ecological site. It has a very long name. Sparse perennial grasses and forbs are occasionally encountered. Annual forbs and grasses flourish following rainfall. Natural disturbances are rare. After introduction of non-native annuals (forbs and/or grasses), the shift in total productivity is shift increased seasonal herbaceous production following periods of rain. Dominant shrub is blackbrush. A variety of large shrubs may be scattered across the site. Assorted half-shrubs are also scattered.

State and transition model

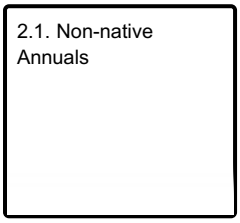
Ecosystem states



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. The major shrub is blackbrush. Other shrubs include creosotebush, Anderson wolfberry, range ratany, Nevada Mormon tea and flattop buckwheat. Mohave yucca, California Juniper and Joshua tree occur in patches within the community. Grasses include big galleta, bush muhly, desert needlegrass and annual grasses.

Table 5. Annual production by plant type

Plant Type	Low (Lb/Acre)	Representative Value (Lb/Acre)	High (Lb/Acre)
Shrub/Vine	147	254	376
Grass/Grasslike	42	75	118
Forb	11	20	47
Tree	0	1	9
Total	**200**	**350**	**550**

Table 6. Ground cover

Tree foliar cover	0%
Shrub/vine/liana foliar cover	2-4%
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 (Ft)	Tree	Shrub/Vine	Grass/ Grasslike	Forb
<0.5	–	–	–	0-2%
>0.5 <= 1	–	–	1-3%	–
>1 <= 2	–	–	–	–
>2 <= 4.5	–	18-22%	–	–
>4.5 <= 13	0-2%	–	–	–
>13 <= 40	–	–	–	–
>40 <= 80	–	–	–	–
>80 <= 120	–	–	–	–
>120	–	–	–	–

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 wild oat, 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 (Lb/Acre)	Foliar Cover (%)
Grass/Grasslike					
1				4–18	
	big galleta	PLRI3	*Pleuraphis rigida*	4–18	–
2				4–18	

	bush muhly	MUPO2	*Muhlenbergia porteri*	4–18	–
3				4–7	
	Parish's threeawn	ARPUP5	*Aristida purpurea var. parishii*	4–7	–
4				4–18	
	desert needlegrass	ACSP12	*Achnatherum speciosum*	4–18	–
5				4–18	
	Grass, perennial	2GP	*Grass, perennial*	4–18	–
6				4–18	
	Grass, annual	2GA	*Grass, annual*	4–18	–
Forb					
7				7–18	
	desert globemallow	SPAM2	*Sphaeralcea ambigua*	7–18	–
8				4–10	
	Forb, perennial	2FP	*Forb, perennial*	4–10	–
9				4–7	
	Forb, annual	2FA	*Forb, annual*	4–7	–
Shrub/Vine					
10				105–140	
	blackbrush	CORA	*Coleogyne ramosissima*	105–140	–
11				7–18	
	banana yucca	YUBA	*Yucca baccata*	0–18	–
	Mojave yucca	YUSC2	*Yucca schidigera*	0–18	–
12				4–18	
	littleleaf ratany	KRER	*Krameria erecta*	0–18	–
	white ratany	KRGR	*Krameria grayi*	0–18	–
13				0–10	
	rayless goldenhead	ACSP	*Acamptopappus sphaerocephalus*	0–10	–
14				0–4	
	longspine horsebrush	TEAXL	*Tetradymia axillaris var. longispina*	0–4	–
15				4–18	
	Nevada jointfir	EPNE	*Ephedra nevadensis*	4–18	–
16				4–18	
	Eastern Mojave buckwheat	ERFAP	*Eriogonum fasciculatum var. polifolium*	4–18	–
17				0–4	
	buckhorn cholla	CYACM	*Cylindropuntia acanthocarpa var. major*	0–4	–
18				0–10	
	burrobrush	HYSA	*Hymenoclea salsola*	0–10	–
19				4–18	
	water jacket	LYAN	*Lycium andersonii*	4–18	–
20				18–35	
	creosote bush	LATR2	*Larrea tridentata*	18–35	–
21				4–18	

	Shrub, other	2S	*Shrub, other*	4–18	–
Tree					
22				0–7	
	California juniper	JUCA7	*Juniperus californica*	0–4	–
	Joshua tree	YUBR	*Yucca brevifolia*	0–4	–

Contributors

Harmon Hodgkinson
Harmon S. Hodgkinson
Karlynn Huling
Larry D. Ellicott
Stephen Cassady

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	05/11/2025
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):**

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:**
