USDA Natural Resources
Conservation Service

Ecological site R030XB226AZ
Sandy Loam Upland 6-9" p.z. Fine

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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 30-2 – 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 found on gently sloping uplands. The soils are non-calcareous in the upper 24 inches, then

strongly effervescent. Surface soil of sandy loam overlays sandy clay loam subsurface soils.

Associated sites

R030XB205AZ	**Sandy Loam Upland 6-10" p.z. Limy Subsurface, Gravelly**
R030XB207AZ	**Granitic Hills 6-9" p.z.**

Table 1. Dominant plant species

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

Physiographic features

This ecological site is found in an upland position on ridges and sideslopes of fan terraces.

Table 2. Representative physiographic features

Landforms	(1) Ridge (2) Fan (3) Terrace
Flooding frequency	None
Ponding frequency	None
Elevation	732–823 m
Slope	1–3%
Aspect	Aspect is not a significant factor

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 deep to very deep with surface textures of sandy loam. Subsoil textures are sandy clay loam and coarse sandy loam. The available water capacity is moderate. the soil's erosion hazard by water is slight and by wind is moderate. The soil is non-saline, non-sodic and mildly to moderately alkaline (7.5-8.0 pH). The soil moisture regime is typic aridic and temperature regime is thermic.

A typical soil profile is:
A--0 to 2 inches; light yellowish brown (10YR 6/4) fine sandy loam, yellowish brown (10YR 5/4) moist; common medium platy structure; soft, very friable, slightly sticky and slightly plastic; common very fine roots; common very fine irregular pores; 10 percent gravel; noneffervescent; slightly alkaline (pH 7.8); abrupt smooth boundary. (1 to 3 inches thick)

Bt--2 to 28 inches; brown (7.5YR 5/4) gravelly sandy clay loam, brown (7.5YR 4/4) moist; weak fine subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; common very fine roots; common very fine tubular pores; few faint clay films on ped faces and in pores; 30 percent gravel; noneffervescent; moderately alkaline (pH 8.0); clear smooth boundary. (20 to 28 inches thick)

2Btk--28 to 41 inches; brown (7.5YR 5/4) gravelly sandy clay loam, brown (7.5YR 4/4) moist; weak fine subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; few very fine roots; few very fine tubular pores; few faint clay films on ped faces and in pores; 30 percent gravel; strongly effervescent; few very fine soft seams and filaments of calcium carbonate; moderately alkaline (pH 8.0); clear smooth boundary. (4 to 13 inches thick)

2Bk--41 to 60 inches; brown (7.5YR 5/4) very gravelly coarse sandy loam, brown (7.5YR 4/4) moist; weak fine subangular blocky structure; soft, very friable, nonsticky and nonplastic; few very fine roots; few very fine tubular pores; 40 percent gravel; strongly effervescent; moderately alkaline (pH 8.0).

The soil taxanomic classification is Fine-loamy, mixed, superactive, thermic Typic Haplargids.

Soil map units correlated to this ecological site include 697032, 697037, 697038, and 697121, Dutchman soil, 697038, Garnet soil, 697102, Ohaco Family soil, Mohave County, Arizona, Central Part SSA.

Table 4. Representative soil features

Surface texture	(1) Sandy loam (2) Coarse sandy loam
Family particle size	(1) Loamy
Drainage class	Well drained
Permeability class	Moderate
Soil depth	152 cm
Surface fragment cover <=3"	0–20%
Surface fragment cover >3"	0%
Available water capacity (0-101.6cm)	12.7–21.59 cm
Calcium carbonate equivalent (0-101.6cm)	0–10%
Electrical conductivity (0-101.6cm)	0 mmhos/cm
Sodium adsorption ratio (0-101.6cm)	0
Soil reaction (1:1 water) (0-101.6cm)	7.4–8.4
Subsurface fragment volume <=3" (Depth not specified)	20–70%
Subsurface fragment volume >3" (Depth not specified)	0%

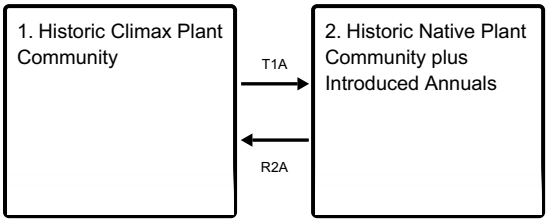
Ecological dynamics

Sandy Loam Upland, 6"-9" p.z., Fine, is a dispersed desert shrub dominated ecological site. Perennial grasses and forbs are present in natural depressions. Joshua Trees, scattered across the site are indicative of the presence of

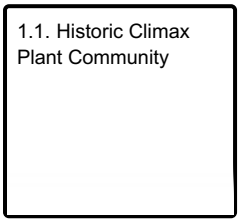
carbonates deep within the soil profile. Annual forbs and grasses flourish following rainfall. Natural disturbances are rare. After introduction of non-native annuals (forbs and/or grasses), the shift in total productivity with shift slightly toward seasonal herbaceous production following periods of rain. Dominant shrubs are creosote and white bursage. Assorted half-shrubs are widely scattered.

State and transition model

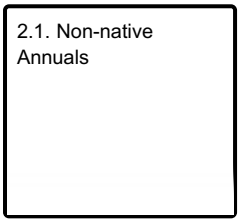
Ecosystem states



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 scattered Joshua trees. Creosotebush and white bursage dominate. Grasses in the understory include big galleta and bush muhly. With severe disturbance, creosotebush, white bursage and annuals will increase, unwanted annual grasses and forbs will invade.

Table 5. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Shrub/Vine	85	207	342
Grass/Grasslike	19	73	159
Forb	7	22	46
Tree	1	6	13
Total	**112**	**308**	**560**

Table 6. Ground cover

Tree foliar cover	0%
Shrub/vine/liana foliar cover	0-2%
Grass/grasslike foliar cover	0%

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	–	–	–	–
>4 <= 12	–	–	–	–
>12 <= 24	–	–	–	–
>24 <= 37	–	–	–	–
>37	–	–	–	–

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 8. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Kg/Hectare)	Foliar Cover (%)
Grass/Grasslike					
1				16–46	
	big galleta	PLRI3	*Pleuraphis rigida*	16–46	–
2				0–16	
	bush muhly	MUPO2	*Muhlenbergia porteri*	0–16	–
3				3–16	
	Grass, annual	2GA	*Grass, annual*	3–16	–
4				0–7	
	Grass, perennial	2GP	*Grass, perennial*	0–7	–
Forb					
5				3–16	
	Forb, annual	2FA	*Forb, annual*	3–16	–
6				3–7	
	Forb, perennial	2FP	*Forb, perennial*	3–7	–
Shrub/Vine					
7				62–92	
	creosote bush	LATR2	*Larrea tridentata*	62–92	–
8				46–77	
	burrobush	AMDU2	*Ambrosia dumosa*	46–77	–
9				3–16	
	water jacket	LYAN	*Lycium andersonii*	3–16	–
10				3–16	
	rayless goldenhead	ACSP	*Acamptopappus sphaerocephalus*	3–16	–
11				0–7	
	beavertail pricklypear	OPBA2	*Opuntia basilaris*	0–7	–
12				0–9	
	buckhorn cholla	CYACA2	*Cylindropuntia acanthocarpa var. acanthocarpa*	0–9	–
13				3–16	
	littleleaf ratany	KRER	*Krameria erecta*	3–16	–
14				3–16	
	Shrub, other	2S	*Shrub, other*	3–16	–
Tree					
15				3–11	
	Joshua tree	YUBR	*Yucca brevifolia*	3–9	–

Contributors

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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	05/13/2025
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:**