USDA Natural Resources
Conservation Service

Ecological site R030XC305AZ
Coarse Sandy Loam 10-13" p.z.

Last updated: 10/21/2024
Accessed: 05/13/2025

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. Soils are non-calcareous, moderately deep to deep. Textures range from gravelly sandy loam to gravelly loamy sand.

Associated sites

R030XC321AZ	**Sandy Loam Upland 10-13" p.z. Fine** Sandy Loam Upland, 10 to 13

Table 1. Dominant plant species

Tree	Not specified
Shrub	(1) *Hymenoclea salsola*
Herbaceous	(1) *Pleuraphis rigida*

Physiographic features

This ecological site is located in an upland position on shoulders, summits and sideslopes of fan terraces.

Table 2. Representative physiographic features

Landforms	(1) Fan (2) Terrace
Flooding frequency	None
Ponding frequency	None
Elevation	610–1,219 m
Slope	1–6%
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 deep to very deep. Soil surface textures are loam, gravelly sandy loam, very gravelly sandy loam, very gravelly sand, loamy sand and sandy loam. Subsoil textures are loam, gravelly sandy loam, very gravelly sandy loam, sandy loam, loamy coarse sand, gravelly sandy clay loam, extremely gravelly sand, coarse sandy loam, gravelly loamy sand and fine sandy loam. The soil available water capacity is low to high. The soil's erosion hazard by water is slight to moderate and by wind is slight to severe. The soil is non-saline, non-sodic with pH range of 7.2-8.0 (neutral to moderately alkaline). The soil moisture regime is typic aridic and temperature regime is thermic.

A typical soil profile is:

A-0 to 1 inch; very stony sandy loam
BA-1 to 3 inches; gravelly sandy loam
Bw-13 to 60 inches; very gravelly sandy loam

Soil taxinomic classifications for soils correlated to this ecological site include Loamy-skeletal, mixed, superactive, thermic Typic Haplocambids; Sandy, mixed, thermic Typic Toriorthets; Coarse-Loamy, mixed, superactive, thermic Typic Haplocambids; and Fine-loamy, mixed, superactive, thermic Ustic Haplocambids.

Soil survey map units correlated to this ecological site include 697013, Detrital soil; 697057, Hooks family soil; Mohave County, AZ, Central Part SSA, 627076 and 627078, Lostman soil; and 627085, Orwash family soil, Mohave County, AZ, Southern Part SSA.

Table 4. Representative soil features

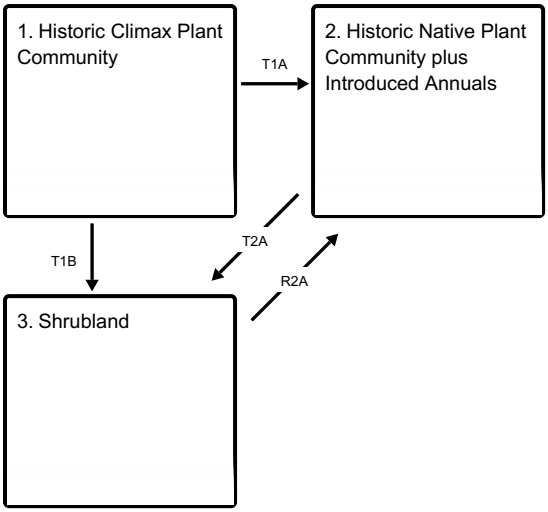
Surface texture	(1) Gravelly loam (2) Very gravelly sandy loam (3) Extremely gravelly loamy sand
Family particle size	(1) Loamy
Drainage class	Well drained to somewhat excessively drained
Permeability class	Moderate to rapid
Soil depth	152 cm
Surface fragment cover <=3"	30–40%
Surface fragment cover >3"	25–60%
Available water capacity (0-101.6cm)	10.16–20.32 cm
Calcium carbonate equivalent (0-101.6cm)	0–14%
Electrical conductivity (0-101.6cm)	0–2 mmhos/cm
Sodium adsorption ratio (0-101.6cm)	0–2
Soil reaction (1:1 water) (0-101.6cm)	7.4–8.4
Subsurface fragment volume <=3" (Depth not specified)	20–45%
Subsurface fragment volume >3" (Depth not specified)	0%

Ecological dynamics

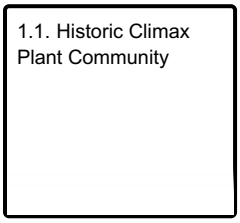
Coarse Sandy Loam, 10"-13" p.z., is a grassland ecological site. Shrubs are scattered across the site. Annual forbs and grasses flourish following rainfall. Natural disturbances are rare. After introduction of non-native annuals (forbs and/or grasses), the shift in total productivity is shift increased seasonal herbaceous production following periods of rain. Continuous, yearlong, livestock grazing will remove the perennial grass dominance.

State and transition model

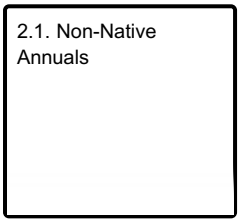
Ecosystem states



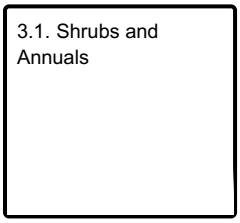
State 1 submodel, plant communities



State 2 submodel, plant communities



State 3 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 grassland. Shrubs are present, but grasses dominate. The major grass is big galleta. Other grasses include bush muhly, black grama, sand dropseed and Indian ricegrass. Major shrubs include white burrobush, creosotebush and rayless goldenhead. In some areas, scattered Joshua trees are present. With severe disturbance, white burrobush, broom snakeweed and rayless goldenhead will increase; Russian thistle and other unwanted annuals will invade.

Table 5. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Grass/Grasslike	80	219	417
Shrub/Vine	26	84	178
Forb	7	28	59
Tree	–	6	18
Total	**113**	**337**	**672**

Table 6. Ground cover

Tree foliar cover	0%
Shrub/vine/liana foliar cover	0-2%
Grass/grasslike foliar cover	1-3%
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	–	–	–	–
>0.3 <= 0.6	–	4-6%	18-22%	–
>0.6 <= 1.4	–	–	–	–
>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 wild oat, red brome, Mediterranean grass (Schismus spp.), and filaree. The flourish of non-native annuals that occurs following rainfalls may preclude native annuals.

State 3
Shrubland

Community 3.1
Shrubs and Annuals

Years of continuous livestock grazing (same season, yearlong) will remove perennial grasses and reduce desirable shrubs. Native and non-native annuals flourish in the bare interspaces.

Transition T1A
State 1 to 2

Introduction of non-native annual forb and grass seed.

Transition T1B
State 1 to 3

Yearlong continuous livestock grazing. Introduction of non-native annual forb and grass seed.

Transition T2A
State 2 to 3

Yearlong continuous livestock grazing.

Restoration pathway R2A
State 3 to 2

Prescribed grazing/no grazing. Range seeding may accelerate establishment of perennial grasses and desirable shrubs.

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				135–168	
	big galleta	PLRI3	*Pleuraphis rigida*	135–168	–
2				3–17	
	bush muhly	MUPO2	*Muhlenbergia porteri*	3–17	–
3				3–17	
	black grama	BOER4	*Bouteloua eriopoda*	3–17	–
4				3–17	
	sand dropseed	SPCR	*Sporobolus cryptandrus*	3–17	–
5				0–10	
	Parish's threeawn	ARPUP5	*Aristida purpurea var. parishii*	0–10	–
6				3–17	
	Indian ricegrass	ACHY	*Achnatherum hymenoides*	3–17	–

7				0–10	
	spike dropseed	SPCO4	*Sporobolus contractus*	0–10	–
8				0–10	
	Grass, annual	2GA	*Grass, annual*	0–10	–
9				3–17	
	Grass, perennial	2GP	*Grass, perennial*	3–17	–
Forb					
10				3–7	
	desert globemallow	SPAM2	*Sphaeralcea ambigua*	3–7	–
11				0–7	
	desert trumpet	ERIN4	*Eriogonum inflatum*	0–7	–
12				0–3	
	desert marigold	BAMU	*Baileya multiradiata*	0–3	–
13				3–10	
	Forb, annual	2FA	*Forb, annual*	3–10	–
14				3–7	
	Forb, perennial	2FP	*Forb, perennial*	3–7	–
Shrub/Vine					
15				3–17	
	creosote bush	LATR2	*Larrea tridentata*	3–17	–
16				34–50	
	burrobrush	HYSA	*Hymenoclea salsola*	34–50	–
17				3–7	
	buckhorn cholla	CYACM	*Cylindropuntia acanthocarpa var. major*	3–7	–
18				0–10	
	Mexican bladdersage	SAME	*Salazaria mexicana*	0–10	–
19				3–17	
	rayless goldenhead	ACSP	*Acamptopappus sphaerocephalus*	3–17	–
20				0–3	
	beavertail pricklypear	OPBA2	*Opuntia basilaris*	0–3	–
21				0–3	
	whitestem paperflower	PSCO2	*Psilostrophe cooperi*	0–3	–
22				0–3	
	Eastern Mojave buckwheat	ERFAP	*Eriogonum fasciculatum var. polifolium*	0–3	–
23				0–3	
	catclaw acacia	ACGR	*Acacia greggii*	0–3	–
24				0–10	
	water jacket	LYAN	*Lycium andersonii*	0–10	–
25				0–10	
	winterfat	KRLA2	*Krascheninnikovia lanata*	0–10	–
26				0–7	
	broom snakeweed	GUSA2	*Gutierrezia sarothrae*	0–7	–
27				3–17	

	Shrub, other	2S	*Shrub, other*	3–17	–
Tree					
28				0–10	
	Joshua tree	YUBR	*Yucca brevifolia*	0–10	–

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:

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17. **Perennial plant reproductive capability:**
