USDA Natural Resources
Conservation Service

Ecological site R030XB217AZ
Sandy Bottom 6-9" 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.

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 located in bottoms. Soils are sandy with evidence of high water flows making up a water channel.

Table 1. Dominant plant species

Tree	Not specified

Shrub	(1) *Hymenoclea salsola* (2) *Ambrosia dumosa*
Herbaceous	Not specified

Physiographic features

This ecological site occurs in a bottom position in ephemeral drainageways or washes. It is found on the slightly elevated areas and alluvial fans of washes, drainageways and floodplains.

Table 2. Representative physiographic features

Landforms	(1) Wash (2) Drainageway (3) Flood plain
Flooding duration	Extremely brief (0.1 to 4 hours) to brief (2 to 7 days)
Flooding frequency	Occasional to frequent
Ponding duration	Very brief (4 to 48 hours) to brief (2 to 7 days)
Ponding frequency	None to rare
Elevation	457–823 m
Slope	0–3%
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

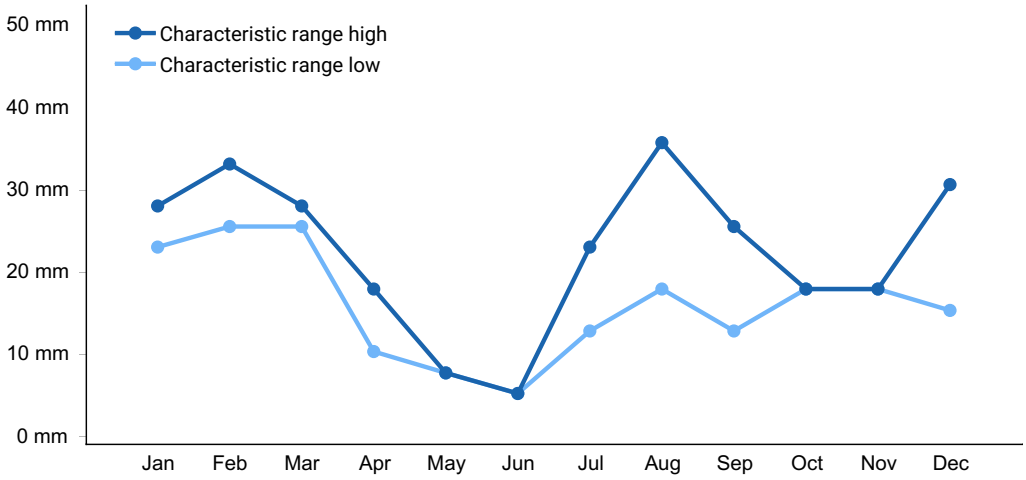


Figure 1. Monthly precipitation range

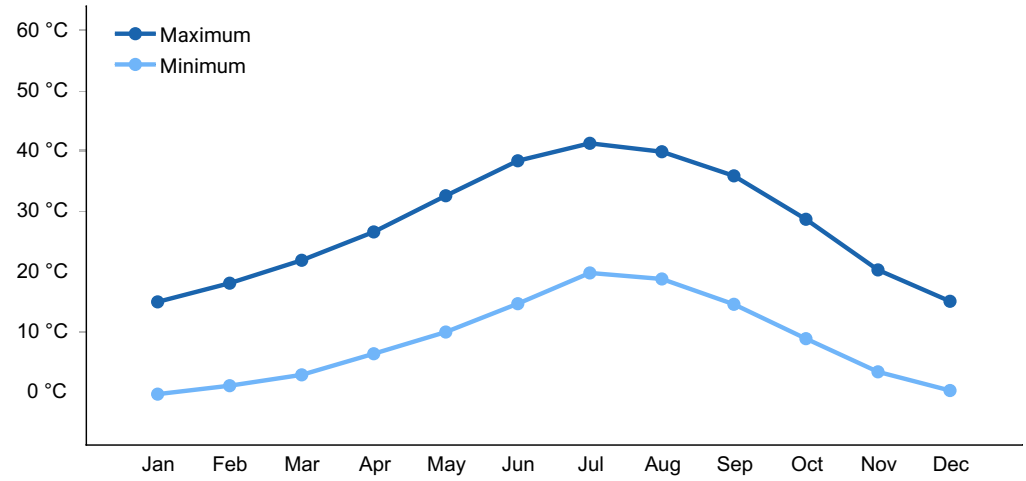


Figure 2. Monthly average minimum and maximum temperature

Influencing water features

Soil features

The soil of this ecological site is deep to very deep. The soil surface textures are gravelly sandy loam & sandy loam. Subsoil textures are gravelly sandy loam, extremely gravelly loamy sand, very gravelly loamy coarse sand, loamy sand, gravelly loamy sand, gravelly sand, coarse loamy sand, and extremely coarse sandy loam. The available water capacity is low. The erosion hazard by water is moderate to severe and by wind is slight to severe. The soil is non-saline, non-sodic with pH of 7.6-8.2 (mildly to moderately alkaline). The soil moisture regime is typic aridic and temperature regime is thermic. Riverwash is associated, often inermixed, with this site.

A typical profile of this soil is:
A-0 to 2 nches; sandy loam
C1-2 to 18 inches; loamy sand
C2-18 to 33 inches; stratified loamy sand
C3-33 to 60 inches; gravelly loamy sand

The taxonomic classification of this soil is Sandy, mixed thermic Typic Torrifluvents.

Soils correlated to this ecological site include map unit 627010, Arizo and Franconia soils, Mohave County, AZ, Southern Part SSA.

Table 4. Representative soil features

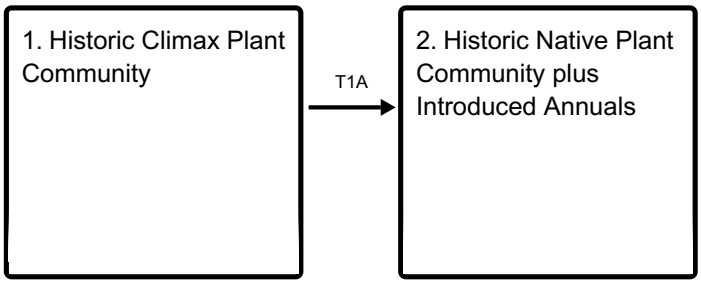
Surface texture	(1) Gravelly sandy loam (2) Sandy loam
Family particle size	(1) Sandy
Drainage class	Somewhat excessively drained to excessively drained
Permeability class	Slow to moderate
Soil depth	152 cm
Surface fragment cover <=3"	0–45%
Surface fragment cover >3"	0%
Available water capacity (0-101.6cm)	8.89–12.7 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)	0–80%
Subsurface fragment volume >3" (Depth not specified)	0%

Ecological dynamics

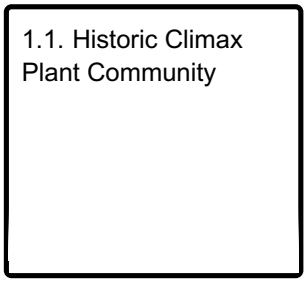
Sandy Bottom, 6"-9" p.z., is a shrub dominated ecological site with scattered trees. Sparse perennial grasses and forbs are occasionally encountered. Annual forbs and grasses flourish following rainfall. Flash flooding is a frequent disturbance. Other natural disturbances are rare. After introduction of non-native annuals (forbs and/or grasses), they flourish after wet winters. Dominant shrubs are burrobrush and white bursage. Assorted half-shrubs are widely scattered.

State and transition model

Ecosystem states



State 1 submodel, plant communities



State 1
Historic Climax Plant Community

Community 1.1
Historic Climax Plant Community

The dominant aspect of this plant community of this ecological site is a tall and mid shrub community with some grasses and forbs in the understory. Major shrubs include catclaw acacia, white burrobush, white bursage and creosotebush. Grasses are big galleta and bush muhly.

Table 5. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Shrub/Vine	86	275	573
Grass/Grasslike	19	84	192
Forb	7	34	76
Total	**112**	**393**	**841**

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	–	8-12%	–	–
>1.4 <= 4	–	–	–	–
>4 <= 12	–	–	–	–
>12 <= 24	–	–	–	–
>24 <= 37	–	–	–	–
>37	–	–	–	–

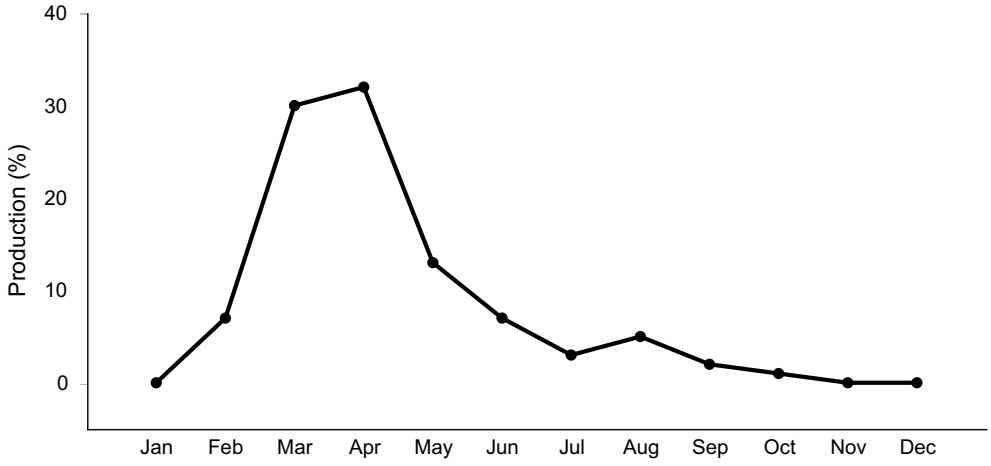


Figure 4. Plant community growth curve (percent production by month). AZ3011, 30.1 3-6" p.z. all sites. Growth begins in late winter, most growth occurs in the spring..

State 2
Historic Native Plant Community plus Introduced Annuals

This plant community resembles the historic native plant community, but exotic annuals have been introduced. Non-native species include Asian mustard (*Brassica tournefortii*), 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				4–20	
	big galleta	PLRI3	*Pleuraphis rigida*	4–20	–
2				4–20	
	bush muhly	MUPO2	*Muhlenbergia porteri*	4–20	–
3				0–4	
	sand dropseed	SPCR	*Sporobolus cryptandrus*	0–4	–
4				4–58	
	Grass, annual	2GA	*Grass, annual*	4–58	–
5				4–11	
	Grass, perennial	2GP	*Grass, perennial*	4–11	–
Forb					
6				0–8	
	desert globemallow	SPAM2	*Sphaeralcea ambigua*	0–8	–
7				4–11	
	Forb, annual	2FA	*Forb, annual*	4–11	–
8				4–11	
	Forb, perennial	2FP	*Forb, perennial*	4–11	–
Shrub/Vi					

Shrub/Vine					
9				4–8	
	woolly fruit bur ragweed	AMER	*Ambrosia eriocentra*	4–8	–
10				20–39	
	creosote bush	LATR2	*Larrea tridentata*	20–39	–
11				0–20	
	water jacket	LYAN	*Lycium andersonii*	0–20	–
12				20–39	
	catclaw acacia	ACGR	*Acacia greggii*	20–39	–
13				4–20	
	Mojave rabbitbrush	ERPA29	*Ericameria paniculata*	4–20	–
14				78–118	
	burrobrush	HYSA	*Hymenoclea salsola*	78–118	–
15				58–78	
	burrobush	AMDU2	*Ambrosia dumosa*	58–78	–
16				0–20	
	Shrub, other	2S	*Shrub, other*	0–20	–

Contributors

Harmon Hodgkinson
Harmon S. Hodgkinson
Larry D. Ellicott

Approval

Sarah Quistberg, 2/25/2025

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	05/21/2025
Approved by	Sarah Quistberg
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):

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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:**
