

Ecological site R030XB221AZ Sandy Upland 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.



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 located on gently sloping uplands. Soils are sand throughout.

Associated sites

R030XB205AZ	Sandy Loam Upland 6-10" p.z. Limy Subsurface, Gravelly
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Table 1. Dominant plant species

Tree	Not specified
Shrub	(1) <i>Ambrosia dumosa</i> (2) <i>Larrea tridentata</i>
Herbaceous	(1) <i>Sporobolus cryptandrus</i> (2) <i>Pleuraphis rigida</i>

Physiographic features

This ecological site occurs in an upland position on fan terraces and valley floors in areas where wind blown coarse textured sand has collected over the dominant soil to a depth of several inches or more.

Table 2. Representative physiographic features

Landforms	(1) Terrace (2) Fan (3) Valley floor
Flooding frequency	None
Ponding frequency	None
Elevation	1,500–2,500 ft

Slope	2–8%
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)	9 in

Influencing water features

Soil features

The soil of this ecological site is deep. Its available water capacity is very low to low. The soil erosion hazard is low for water, but high for wind. Runoff is very slow. The soil is non-saline, non-sodic with pH of 7.9-8.4 (moderately alkaline). The soil moisture regime is typic aridic and temperature regime is thermic. The soil surface is generally non-calcareous.

A typical soil profile is:

A-0 to 1 inch; sand, non to slightly calcareous

C1-1 to 3 inches; sand; noneffervescent

C2-3 to 30 inches; sand noneffervescent

C3-30 to 60 inches; sand; slightly effervescent

The soil taxonomic classification is Mixed, thermic Typic Torripsammments.

This ecological site has been correlated to map units 701010, Bluepoint soil, and 701147, Typic Torriorthents, Grand Canyon Area, AZ, Parts of Coconino and Mohave Counties SSA and an inclusion in map unit 623001, Shivwits Area, AZ, SSA.

Table 4. Representative soil features

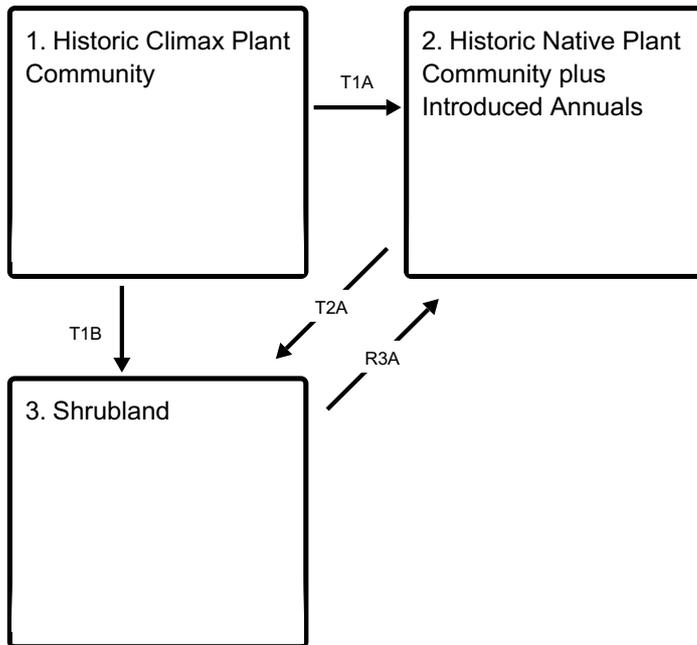
Parent material	(1) Eolian deposits–sandstone
Surface texture	(1) Gravelly fine sand (2) Fine sand
Family particle size	(1) Sandy
Drainage class	Somewhat excessively drained
Permeability class	Rapid
Soil depth	60 in
Surface fragment cover ≤3"	0–10%
Surface fragment cover >3"	0%
Available water capacity (0-40in)	3–5 in
Calcium carbonate equivalent (0-40in)	0–5%
Electrical conductivity (0-40in)	0–2 mmhos/cm
Sodium adsorption ratio (0-40in)	0–13
Soil reaction (1:1 water) (0-40in)	7.9–8.4
Subsurface fragment volume ≤3" (Depth not specified)	0%
Subsurface fragment volume >3" (Depth not specified)	0%

Ecological dynamics

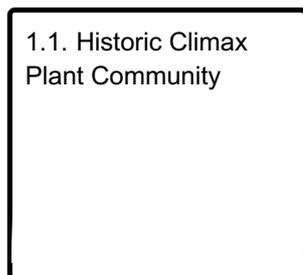
Sandy Upland, 6"-9" p.z., is a dispersed desert shrub-grassland. Perennial grasses are well-distributed across the site. Annual forbs and grasses flourish following rainfall. Natural disturbances are rare. Yearlong livestock grazing will diminish perennial grass basal cover and shift site to shrubland aspect. 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

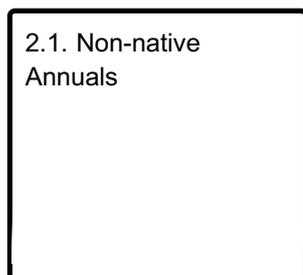
Ecosystem states



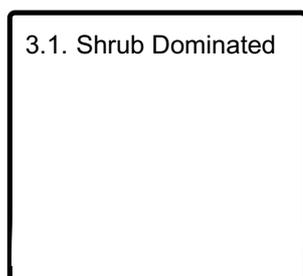
State 1 submodel, plant communities



State 2 submodel, plant communities



State 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 desert shrub-grassland. The major grasses are sand and Mesa dropseed, big galleta and Indian ricegrass. The dominant shrubs are white bursage and creosotebush.

Table 5. Annual production by plant type

Plant Type	Low (Lb/Acre)	Representative Value (Lb/Acre)	High (Lb/Acre)
Shrub/Vine	151	220	323
Grass/Grasslike	90	160	231
Forb	3	10	23
Tree	6	10	23
Total	250	400	600

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 (Ft)	Tree	Shrub/Vine	Grass/ Grasslike	Forb
<0.5	–	–	–	–
>0.5 <= 1	–	–	0-2%	–
>1 <= 2	–	–	–	–
>2 <= 4.5	–	8-12%	–	–
>4.5 <= 13	–	–	–	–
>13 <= 40	0-2%	–	–	–
>40 <= 80	–	–	–	–
>80 <= 120	–	–	–	–
>120	–	–	–	–

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

Figure 6. Plant community growth curve (percent production by month). AZ3070, 30.23 6-9" p.z. big galleta. Growth begins in the spring, most growth occurs during the summer rainy season..

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	0	10	15	5	0	10	45	15	0	0	0

Figure 7. Plant community growth curve (percent production by month). AZ3072, 30.23 6-10" p.z. white bursage. Most growth occurs from March through May..

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	0	15	60	20	5	0	0	0	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 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.

**State 3
Shrubland**

**Community 3.1
Shrub Dominated**

This plant community is dominated by creosote with mixed shrubs throughout. The understory is dominated by annual forbs and grasses. Remnant perennial grasses may occasionally be found within the protection of shrub bases. Non-native annuals flourish.

**Transition T1A
State 1 to 2**

Introduction of non-native annual forb and grass seed.

**Transition T1B
State 1 to 3**

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

**Transition T2A
State 2 to 3**

Yearlong livestock grazing.

**Restoration pathway R3A
State 3 to 2**

Prescribed grazing/no grazing.

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				80–100	
	sand dropseed	SPCR	<i>Sporobolus cryptandrus</i>	80–100	–
	mesa dropseed	SPFL2	<i>Sporobolus flexuosus</i>	80–100	–
	spike dropseed	SPCO4	<i>Sporobolus contractus</i>	40–50	–
2				20–40	

	big galleta	PLRI3	<i>Pleuraphis rigida</i>	20-40	-
3				8-20	
	Indian ricegrass	ACHY	<i>Achnatherum hymenoides</i>	8-20	-
4				0-8	
	Grass, perennial	2GP	<i>Grass, perennial</i>	0-8	-
	threeawn	ARIST	<i>Aristida</i>	0-8	-
	low woollygrass	DAPU7	<i>Dasyochloa pulchella</i>	0-8	-
5				0-8	
	Grass, annual	2GA	<i>Grass, annual</i>	0-8	-
Forb					
6				0-8	
	desert trumpet	ERIN4	<i>Eriogonum inflatum</i>	0-8	-
7				0-4	
	Forb, perennial	2FP	<i>Forb, perennial</i>	0-4	-
	cassia	CASSI	<i>Cassia</i>	0-4	-
	desert globemallow	SPAM2	<i>Sphaeralcea ambigua</i>	0-4	-
	Forb, perennial	2FP	<i>Forb, perennial</i>	0-4	-
	cassia	CASSI	<i>Cassia</i>	0-4	-
	desert globemallow	SPAM2	<i>Sphaeralcea ambigua</i>	0-4	-
8				0-4	
	Forb, annual	2FA	<i>Forb, annual</i>	0-4	-
	buckwheat	ERIOG	<i>Eriogonum</i>	0-4	-
Shrub/Vine					
9				100-160	
	burrobush	AMDU2	<i>Ambrosia dumosa</i>	100-160	-
10				20-60	
	creosote bush	LATR2	<i>Larrea tridentata</i>	20-60	-
11				8-24	
	Nevada jointfir	EPNE	<i>Ephedra nevadensis</i>	8-24	-
12				8-20	
	white ratany	KRGR	<i>Krameria grayi</i>	8-20	-
13				8-12	
	turnentinebroom	THMO	<i>Thamnosma montana</i>	8-12	-

	turpentinebroom	THMO	<i>Trametes montana</i>	8-12	-
14				8-20	
	pricklypear	OPUNT	<i>Opuntia</i>	8-20	-
15				8-12	
	rayless goldenhead	ACSP	<i>Acamptopappus sphaerocephalus</i>	8-12	-
16				4-28	
	Shrub, other	2S	<i>Shrub, other</i>	0-15	-
	broom snakeweed	GUSA2	<i>Gutierrezia sarothrae</i>	0-15	-
	winterfat	KRLA2	<i>Krascheninnikovia lanata</i>	0-15	-
	Utah mortonia	MOUT	<i>Mortonia utahensis</i>	0-15	-
	whitestem paperflower	PSCO2	<i>Psilostrophe cooperi</i>	0-15	-
Tree					
17				8-200	
	Joshua tree	YUBR	<i>Yucca brevifolia</i>	8-20	-

Contributors

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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	07/11/2025
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:**
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17. **Perennial plant reproductive capability:**
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