

Ecological site R030XA109AZ Limy Upland 3-6" p.z. Deep

Accessed: 05/19/2024

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

AZ CRA 30.1 – Lower Mohave Desert

Elevations range from 400 to 2500 feet and precipitation averages 3 to 6 inches per year. Vegetation includes creosotebush, white bursage, Mormon tea, and brittlebush. The soil temperature regime is hyperthermic and the soil moisture regime is typic aridic. 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.

Associated sites

R030XA108AZ	Limy Upland 3-6" p.z. Limy Upland, Deep, 3"-6" p.z.
-------------	---

Table 1. Dominant plant species

Tree	Not specified
------	---------------

Shrub	(1) <i>Larrea tridentata</i> (2) <i>Ambrosia dumosa</i>
Herbaceous	Not specified

Physiographic features

This site occurs on summits and sideslopes of fan terraces. It occurs on all exposures. Slopes generally range from 1 to 15 percent, but may reach as high as 25 percent. Elevation ranges from 650 feet to 2000 feet above sea level.

Table 2. Representative physiographic features

Landforms	(1) Terrace
Flooding frequency	None
Ponding frequency	None
Elevation	183–610 m
Slope	1–25%
Aspect	Aspect is not a significant factor

Climatic features

The 30-1AZ Lower Mohave Desert Shrub land resource unit is characterized by a hot, dry climate. The average annual rainfall is 3 to 6 inches, but it can be extremely variable (e.g. from 0 to 11 inches). There can be long periods when little or no precipitation is received. Most of the precipitation for the year could arrive in just a couple of storms. The soil moisture regime is typic aridic and the soil temperature regime is hyperthermic. Winter precipitation from November through April occurs as gentle rains from storms coming out of the Pacific Ocean. Snow is very rare and only falls in the highest mountains. A seasonal drought occurs in May and June. Summer/fall precipitation from July through October comes from spotty, unreliable, and sometimes violent thunderstorms. The moisture originates in the Gulf of Mexico (and the Pacific Ocean in the fall) and flows into the state on the north end of the Mexican monsoon. Strong winds are common, especially during the spring.

Table 3. Representative climatic features

Frost-free period (average)	325 days
Freeze-free period (average)	365 days
Precipitation total (average)	152 mm

Influencing water features

Soil features

These soils are deep to very deep to any plant root restricting layer. They are very coarse textured. The surface layer ranges from extremely gravelly loam to extremely gravelly sandy loam. The subsurface texture ranges from gravelly sandy loam to extremely gravelly loamy sand. The soil is derived from alluvium from volcanics and granitics. A typical profile appears as follows:

0-8 inches - very gravelly sandy loam

8-19 nches - calcareous extremely gravelly coarse sandy loam

19-28 inches - calcareous very gravelly loamy coarse sand

28-44 inches - calcareous extremely gravelly sandy loam

44-60 inches - weakly to strongly silica- and lime-cemented extremely gravelly loamy coarse sand.

Table 4. Representative soil features

Parent material	(1) Alluvium–granite
-----------------	----------------------

Surface texture	(1) Extremely gravelly loam (2) Extremely gravelly sandy loam
Family particle size	(1) Sandy
Drainage class	Well drained
Permeability class	Moderately rapid to rapid
Soil depth	112–165 cm
Surface fragment cover <=3"	40–55%
Surface fragment cover >3"	0–15%
Calcium carbonate equivalent (0-101.6cm)	10–30%
Electrical conductivity (0-101.6cm)	0–4 mmhos/cm
Soil reaction (1:1 water) (0-101.6cm)	7.8–8.4
Subsurface fragment volume <=3" (Depth not specified)	20–55%
Subsurface fragment volume >3" (Depth not specified)	0–15%

Ecological dynamics

The plant communities found on an ecological site are naturally variable. Composition and production will vary with yearly conditions, location, aspect, and the natural variability of the soils. The historical climax plant community represents the natural potential plant communities found on relict or relatively undisturbed sites. Other plant communities described here represent plant communities that are known to occur when the site is disturbed by factors such as grazing, fire, or drought.

Production data provided in this site description is standardized to air-dry weight at the end of the summer growing season. The plant communities described in this site description are based on near normal rainfall years.

NRCS uses a Similarity Index to compare existing plant communities to the plant communities described here. Similarity Index is determined by comparing the production and composition of a plant community to the production and composition of a plant community described in this site description. To determine Similarity Index, compare the production (air-dry weight) of each species to that shown in the plant community description. For each species, count no more than the maximum amount shown for the species, and for each group, count no more than the maximum shown for the group. Divide the resulting total by the total normal year production shown in the plant community description. If rainfall has been significantly above or below normal, use the total production shown for above or below normal years. If field data is not collected at the end of the summer growing season, then the field data must be corrected to the end of the year production before comparing it to the site description. The growth curve can be used as a guide for estimating production at the end of the summer growing season.

State and transition model



**State 1
Historic Climax Plant Community**

**Community 1.1
Historic Climax Plant Community**

The dominant aspect of this ecological site is a desert shrub. Creosotebush and white bursage are the major shrubs.

Table 5. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Shrub/Vine	76	78	81
Forb	4	12	16
Grass/Grasslike	1	8	11
Total	81	98	108

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	-	-	9-2%	0-2%
>0.15 <= 0.3	-	-	-	-
>0.3 <= 0.6	-	5-7%	-	-
>0.6 <= 1.4	-	-	-	-
>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..

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	7	30	32	13	7	3	5	2	1	0	0

Figure 5. Plant community growth curve (percent production by month). AZ3082, 30.27 3-6" p.z. creosotebush. Growth occurs mostly in the spring using stored winter moisture. Flowers and sets seed by July..

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	0	20	40	20	20	0	0	0	0	0	0

Figure 6. Plant community growth curve (percent production by month). AZ3083, 30.27 3-6" p.z. white bursage. Growth begins in early spring. Dormancy occurs during the hot summer months. With sufficient summer/fall precipitation, some plants may break dormancy and produce a flush of growth. Flowers and sets seed by July..

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	5	20	40	20	15	0	0	0	0	0	0

State 2 Historic Native Plant Community plus Introduced Annuals

Community 2.1 Historic Native Plant Community plus Introduced Annuals

This plant community resembles the historic native plant community, but exotic annuals have been introduced.

Table 8. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Shrub/Vine	76	78	81
Forb	4	12	16
Grass/Grasslike	1	8	11
Total	81	98	108

Table 9. 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 10. Canopy structure (% cover)

Height Above Ground (M)	Tree	Shrub/Vine	Grass/ Grasslike	Forb
<0.15	-	-	0-2%	0-2%
>0.15 <= 0.3	-	-	-	-
>0.3 <= 0.6	-	5-7%	-	-
>0.6 <= 1.4	-	-	-	-
>1.4 <= 4	-	-	-	-
>4 <= 12	-	-	-	-
>12 <= 24	-	-	-	-
>24 <= 37	-	-	-	-
>37	-	-	-	-

Figure 8. 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..

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	7	30	32	13	7	3	5	2	1	0	0

Figure 9. Plant community growth curve (percent production by month). AZ3080, 30.27 3-6" p.z. red brome (exotic). Germinates in October with fall precipitation, most growth occurs in February through April..

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

Figure 10. Plant community growth curve (percent production by month). AZ3081, 30.27 3-6" p.z. redstem filaree (exotic). Germinates in October with fall precipitation, most growth occurs in February through April..

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

Figure 11. Plant community growth curve (percent production by month). AZ3082, 30.27 3-6" p.z. creosotebush. Growth occurs mostly in the spring using stored winter moisture. Flowers and sets seed by July..

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	0	20	40	20	20	0	0	0	0	0	0

Figure 12. Plant community growth curve (percent production by month). AZ3083, 30.27 3-6" p.z. white bursage. Growth begins in early spring. Dormancy occurs during the hot summer months. With sufficient summer/fall precipitation, some plants may break dormancy and produce a flush of growth. Flowers and sets seed by July..

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	5	20	40	20	15	0	0	0	0	0	0

Additional community tables

Table 11. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Kg/Hectare)	Foliar Cover (%)
Grass/Grasslike					
1	Native Perennial Grasses			1-3	
	low woollygrass	DAPU7	<i>Dasyochloa pulchella</i>	1-2	-
	big galleta	PLRI3	<i>Pleuraphis rigida</i>	0-1	-
2	Native Annual Grasses			2-7	
	Grass, annual	2GA	<i>Grass, annual</i>	2-7	-
Forb					
3	Perennial Forbs			1-2	
	desert trumpet	ERIN4	<i>Eriogonum inflatum</i>	0-1	-
	desert globemallow	SPAM2	<i>Sphaeralcea ambigua</i>	0-1	-
4	Native Annual Forbs			2-11	
	Forb, annual	2FA	<i>Forb, annual</i>	2-11	-
	desert Indianwheat	PLOV	<i>Plantago ovata</i>	0-1	-
Shrub/Vine					
5	Native Shrubs			76-81	
	creosote bush	LATR2	<i>Larrea tridentata</i>	40-50	-
	burrobush	AMDU2	<i>Ambrosia dumosa</i>	25-30	-
	Nevada jointfir	EPNE	<i>Ephedra nevadensis</i>	1-4	-
	white ratany	KRGR	<i>Krameria grayi</i>	1-4	-
	button brittlebush	ENFR	<i>Encelia frutescens</i>	0-1	-
	rayless goldenhead	ACSP	<i>Acamptopappus sphaerocephalus</i>	0-1	-
6	Native Yuccas			0-3	
	Mojave yucca	YUSC2	<i>Yucca schidigera</i>	0-3	-

Table 12. Community 2.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Kg/Hectare)	Foliar Cover (%)
Grass/Grasslike					
1	Native Grasses			1–3	
	low woollygrass	DAPU7	<i>Dasyochloa pulchella</i>	1–2	–
	big galleta	PLRI3	<i>Pleuraphis rigida</i>	0–1	–
2	Native Annual Grasses			1–2	
	Grass, annual	2GA	<i>Grass, annual</i>	1–2	–
3	Introduced Annual Grasses			1–6	
	red brome	BRRU2	<i>Bromus rubens</i>	1–6	–
Forb					
4	Native Perennial Forbs			0–2	
	desert trumpet	ERIN4	<i>Eriogonum inflatum</i>	0–1	–
	desert globemallow	SPAM2	<i>Sphaeralcea ambigua</i>	0–1	–
5	Native Annual Forbs			1–6	
	Forb, annual	2FA	<i>Forb, annual</i>	1–4	–
	desert Indianwheat	PLOV	<i>Plantago ovata</i>	0–1	–
6	Introduced Annual Forbs			1–6	
	redstem stork's bill	ERCI6	<i>Erodium cicutarium</i>	1–4	–
Shrub/Vine					
7	Native Shrubs			76–81	
	creosote bush	LATR2	<i>Larrea tridentata</i>	40–50	–
	burrobush	AMDU2	<i>Ambrosia dumosa</i>	25–30	–
	Nevada jointfir	EPNE	<i>Ephedra nevadensis</i>	1–4	–
	white ratany	KRGR	<i>Krameria grayi</i>	1–4	–
	button brittlebush	ENFR	<i>Encelia frutescens</i>	0–1	–
	rayless goldenhead	ACSP	<i>Acamptopappus sphaerocephalus</i>	0–1	–
8	Native Yuccas			0–3	
	Mojave yucca	YUSC2	<i>Yucca schidigera</i>	0–3	–

Type locality

Location 1: Mohave County, AZ	
Township/Range/Section	T29 N. R21 W. S22
General legal description	Black Canyon Quad. - East of Wilson Ridge and West of Temple Bar Road; Sec. 22, T. 29 N., R. 21 W.; Mohave County, Arizona.

Contributors

Harmon S. Hodgkinson
 Larry D. Ellicott
 Stephen Cassady
 Steve Barker

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)	Cody Lunsford and Steve Cassady
Contact for lead author	Steve Cassady, State Rangeland Management Specialist, ph 602.280.8818
Date	04/04/2008
Approved by	S. Cassady
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

Indicators

- 1. Number and extent of rills:** None. A cover of gravel and rock armor the soil surface against erosion.

- 2. Presence of water flow patterns:** Few. This ecological site often occurs along fairly narrow ridge tops. The water flow patterns occur on the side slopes of these ridges as the slope nears 15 percent. Water flow patterns may be observed just above the natural drainages into the washes dissecting the fan terrace the site occurs on. The cover of gravel and rock armors the soil surface against erosion preventing water flow patterns from developing in other locations on the ecological site. No water flow patterns should be observed where the slope is less than 10 percent.

- 3. Number and height of erosional pedestals or terracettes:** None. A cover of gravel and rock armors the soil surface against erosion and the creation of pedestals or terracettes.

- 4. Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):** Bare ground makes up 10 to 20 percent. Rock and gravel cover is 70 to 80 percent. Litter cover is 5 to 15 percent. Basal plant cover is generally less than 5 percent.

- 5. Number of gullies and erosion associated with gullies:** Numerous drainages running approximately vertical to the direction of the ridge topography this ecological site generally occurs on may be observed. These are natural and no active erosion is seen associated with them.

- 6. Extent of wind scoured, blowouts and/or depositional areas:** None. A cover of gravel and rock armors the soil surface against wind erosion and the resulting scoured, blowout and/or depositional areas.

- 7. Amount of litter movement (describe size and distance expected to travel):** Litter is naturally concentrated underneath the scattered shrubs found on this ecological site. The residue of annual forbs and grasses, although naturally scarce, generally stays in place for several months after these plants have senesced due to the soil surface cover of gravel and rock found on this ecological site.

8. **Soil surface (top few mm) resistance to erosion (stability values are averages - most sites will show a range of values):** No slake test information is available. The soil surface is very resistant to both water and wind erosion due to the cover of rocks and gravels.
-
9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** Weak thick platy structure; color is 10YR4/3 moist. The thickness of the A horizon is 2 to 5 inches.
-
10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:** This plant community is characterized by widely scattered shrubs with average spacing of 20 to 30 feet. Canopy cover of shrubs is 5 to 15 percent.
-
11. **Presence and thickness of compaction layer (usually none; describe soil profile features which may be mistaken for compaction on this site):** No compaction layer exists on this ecological site. The soil surface cover of gravel and rock forms a somewhat impenetrable layer, but this is not due to compaction.
-
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: shrubs (75-85%)>>
- Sub-dominant: Forbs (5-15%)>> Grasses (1-10%)
- Other:
- Additional: During years of above average precipitation the ratio of shrubs to annual plants (dominantly annual forbs) will naturally change with the annually produced biomass produced and resulting percent composition of forbs increasing substantially while the biomass of the shrubs will increase only slightly.
-
13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):** Five to ten percent of the perennial plants may be dead or dying due to drought or natural senescence at any given time. Dead branched in the creosote bush and occasionally white bursage are common and natural, increasing during drought periods.
-
14. **Average percent litter cover (%) and depth (in):** Litter is naturally concentrated under shrubs. Litter from winter spring annual production generally stays in place for several months due to the rock and gravel cover found in interspaces.
-
15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):** Average annual production on this site is expected to be 75 to 125 lbs/ac. in a year of average precipitation.
-
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: Red brome (*Bromus rubens*, Mediterranean grass, *Schismus barbatus*, and filaree, *Erodium cicutarium* may be found on the site in very small amounts (< 1% or < 1 lb/ac.).

17. **Perennial plant reproductive capability:** All plants native to this site are adapted to the climate and are capable of producing seeds, stolons, and/or rhizomes except during the most severe droughts.
-