USDA Natural Resources
Conservation Service

Ecological site R040XC310AZ
Limy Upland 3"-7" 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.

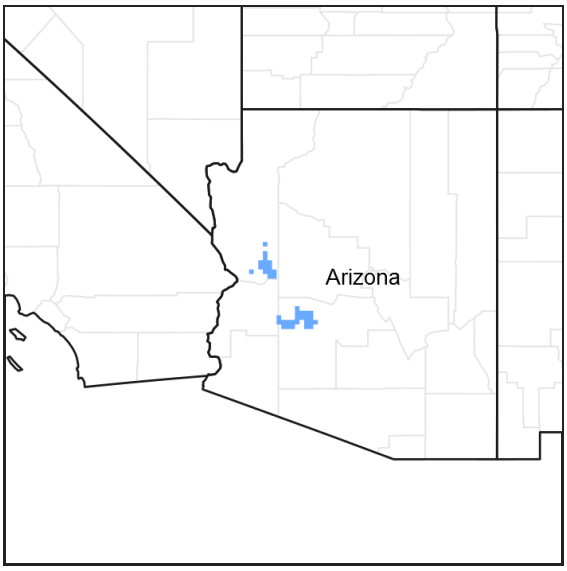

Figure 1. Mapped extent

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): 040X–Sonoran Basin and Range

AZ 40.3 – Colorado Sonoran Desert

Elevations range from 300 to 1200 feet and precipitation averages 3 to 7 inches per year. Vegetation includes creosotebush, white bursage, brittlebush, Mormon tea, teddybear cholla, elephant tree, smoke tree, ocotillo, and big galleta. The soil temperature regime is hyperthermic and the soil moisture regime is typic aridic. This unit occurs within the Basin and Range Physiographic Province and is characterized by numerous mountain ranges that rise abruptly from broad, plain-like valleys and basins. Igneous and metamorphic rock classes dominate the mountain ranges and sediments filling the basins represent combinations of fluvial, lacustrine, colluvial and alluvial deposits.

Table 1. Dominant plant species

Tree	(1) *Parkinsonia microphylla*
Shrub	(1) *Ambrosia dumosa* (2) *Larrea tridentata var. tridentata*
Herbaceous	(1) *Muhlenbergia porteri* (2) *Pleuraphis rigida*

Physiographic features

This range site occurs in an upland position. It does not benefit from run-in moisture from adjacent areas. It does suffer loss from run-off. It is located on terraces and alluvial fans.

Table 2. Representative physiographic features

Landforms	(1) Terrace (2) Alluvial fan
Elevation	400–1,000 ft
Slope	0–6%

Climatic features

Precipitation in this common resource area ranges from 3-7 inches yearly. Despite historical averages in rainfall amounts, as one moves from east to west in this resource area rains become more unpredictable and variable with Coefficients of Variation of annual rainfall equal to 44% at Gila Bend and 65% at Mohawk. Winter-Summer rainfall ratios are 40-60%. Summer rains fall July-September, originate in the Gulf of Mexico and are convective, usually brief intense thunderstorms. Summer thunderstorms usually form over the mountains in the afternoon and spread to the valleys and plains in the evening. The intensity of this precipitation is moderate to heavy, but rarely lasts more than half an hour. Many times these storms produce little more than gusty winds and light showers. Cool season moisture tends to be frontal, originate in the Pacific and Gulf of California and falls in widespread storms with long duration and low intensity. Snow is very rare and falls normally only in the higher mountains.

Mean temperatures for the hottest month (Jul) is 93 F; the coldest month (Jan) is 53 F. Extreme temperatures of 125 F and 10 F have been recorded. Long periods with little or no effective moisture occur frequently.

The winter-spring precipitation is the most dependable on the site. Perennial grasses, though classed as warm season growers, grow actively year-round when moisture is available. Shrubs and trees generally respond to seasonal moisture. The two rainy periods bring about their respective production of either winter or summer annual grasses and forbs.

Table 3. Representative climatic features

Frost-free period (average)	363 days
Freeze-free period (average)	0 days
Precipitation total (average)	7 in

Influencing water features

Soil features

Soils that are grouped together in this ecological site are shallow to plant root restricting layers. Surface soil texture has a depth of 2-5 inches and range in texture from sand, gravelly loam to clay. Underlying layers have moderately slow to rapid permeability rates, but can absorb and hold all the moisture the climate supplies. Soluble salt accumulations are low. pH ranges from 7.9-8.4. With good vegetation cover, infiltration rates are high to moderate. Stability against erosion processes is good and plant-soil moisture relationships are very good. Coarse fragments may occur throughout the soil.

Soils mapped on this site include: in SSA-627 Southern Mohave county MU's Cherioni-28 & Cipriano-31; SSA-645 Aguila-Carefree area MU's Cipriano-69 & 107; SSA-653 Gila Bend-Ajo area MU's Cherioni CoXFSL-8, Cherioni GrXL-8 & Cavelt-39.

Table 4. Representative soil features

Parent material	(1) Alluvium–volcanic breccia
Surface texture	(1) Gravelly sandy loam (2) Very gravelly fine sandy loam (3) Extremely gravelly loam
Family particle size	(1) Loamy
Drainage class	Well drained
Permeability class	Moderately rapid to rapid
Soil depth	4–20 in
Surface fragment cover <=3"	20–60%
Surface fragment cover >3"	1–5%
Available water capacity (0-40in)	0.24–2 in
Calcium carbonate equivalent (0-40in)	10–35%
Electrical conductivity (0-40in)	0–2 mmhos/cm
Sodium adsorption ratio (0-40in)	0
Soil reaction (1:1 water) (0-40in)	7.9–8.4
Subsurface fragment volume <=3" (Depth not specified)	20–60%
Subsurface fragment volume >3" (Depth not specified)	1–5%

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 fire, grazing, 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 amount shown for each group. Divide the resulting total by the total normal year production shown in the plant community description. If the 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

The State and Transition Model and Accompanying Narrative Descriptions are Still To Be Developed for this Ecological Site. For More Information Contact The Arizona NRCS State Rangeland Management Specialist.

State 1
Historic Climax Plant Community

Community 1.1
Historic Climax Plant Community

The plant community is predominantly desert shrubs and cacti with creosotebush dominant on the site. Perennial grass cover is sparse and annual grasses and forbs make up a small percentage of the community. As palatable forage production on this site is very low, the plant community has changed very little, from potential, since the introduction of domestic grazing.

Table 5. Annual production by plant type

Plant Type	Low (Lb/Acre)	Representative Value (Lb/Acre)	High (Lb/Acre)
Shrub/Vine	85	90	95
Tree	1	5	10
Grass/Grasslike	5	7	10
Forb	1	3	5
Total	**92**	**105**	**120**

Figure 5. Plant community growth curve (percent production by month). AZ4041, 40.3 3-7" p.z. all sites. Most growth occurs in the winter to early spring, plants are dormant May through October..

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
5	20	40	25	0	0	0	0	0	0	5	5

Additional community tables

Table 6. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Lb/Acre)	Foliar Cover (%)
Grass/Grasslike					
1	**Perennial Grasses**			5–10	
	threeawn	ARIST	*Aristida*	0–1	–
	low woollygrass	DAPU7	*Dasyochloa pulchella*	0–1	–
	bush muhly	MUPO2	*Muhlenbergia porteri*	0–1	–
	big galleta	PLRI3	*Pleuraphis rigida*	0–1	–
2	**Annual Grasses**			1–5	
	sixweeks threeawn	ARAD	*Aristida adscensionis*	0–1	–
	needle grama	BOAR	*Bouteloua aristidoides*	0–1	–
	sixweeks grama	BOBA2	*Bouteloua barbata*	0–1	–
	sixweeks fescue	VUOC	*Vulpia octoflora*	0–1	–
Forb					
3	**Forbs**			0–5	
	trailing windmills	ALIN	*Allionia incarnata*	0–1	–
	common fiddleneck	AMMEI2	*Amsinckia menziesii var. intermedia*	0–1	–
	New Mexico silverbush	ARNE2	*Argythamnia neomexicana*	0–1	–
	smallflowered milkvetch	ASNU4	*Astragalus nuttallianus*	0–1	–
	milkvetch	ASTRA	*Astragalus*	0–1	–
	desert marigold	BAMU	*Baileya multiradiata*	0–1	–
	California suncup	CACA32	*Camissonia californica*	0–1	–
	brittle spineflower	CHBR	*Chorizanthe brevicornu*	0–1	–
	devil's spineflower	CHRI	*Chorizanthe rigida*	0–1	–
	Esteve's pincushion	CHST	*Chaenactis stevioides*	0–1	–
	cryptantha	CRYPT	*Cryptantha*	0–1	–
	hairy prairie clover	DAMO	*Dalea mollis*	0–1	–
	flatcrown buckwheat	ERDE6	*Eriogonum deflexum*	0–1	–
	miniature woollystar	ERDI2	*Eriastrum diffusum*	0–1	–
	desert trumpet	ERIN4	*Eriogonum inflatum*	0–1	–
	buckwheat	ERIOG	*Eriogonum*	0–1	–
	little deserttrumpet	ERTR8	*Eriogonum trichopes*	0–1	–
	spurge	EUPHO	*Euphorbia*	0–1	–
	California fagonbush	FALA	*Fagonia laevis*	0–1	–
	gilia	GILIA	*Gilia*	0–1	–
	desert lily	HEUN2	*Hesperocallis undulata*	0–1	–
	Gordon's bladderpod	LEGO	*Lesquerella gordonii*	0–1	–
	pepperweed	LEPID	*Lepidium*	0–1	–
	foothill deervetch	LOHU2	*Lotus humistratus*	0–1	–

	foothill deervetch	LOHI2	*Lotus humistratus*	0–1	
	strigose bird's-foot trefoil	LOSTT	*Lotus strigosus var. tomentellus*	0–1	–
	Coulter's lupine	LUSP2	*Lupinus sparsiflorus*	0–1	–
	Parry's false prairie-clover	MAPA7	*Marina parryi*	0–1	–
	bristly nama	NAHI	*Nama hispidum*	0–1	–
	glandular threadplant	NEGL	*Nemacladus glanduliferus*	0–1	–
	evening primrose	OENOT	*Oenothera*	0–1	–
	combseed	PECTO	*Pectocarya*	0–1	–
	desert Indianwheat	PLOV	*Plantago ovata*	0–1	–
	Coues' cassia	SECO10	*Senna covesii*	0–1	–
	dwarf blue-eyed grass	SIMI2	*Sisyrinchium minus*	0–1	–
	desert globemallow	SPAM2	*Sphaeralcea ambigua*	0–1	–
	Coulter's globemallow	SPCO2	*Sphaeralcea coulteri*	0–1	–
	woollyhead neststraw	STMI2	*Stylocline micropoides*	0–1	–
	woolly tidestromia	TILA2	*Tidestromia lanuginosa*	0–1	–
Shrub/Vine					
4	**Dominant Shrubs**			30–85	
	burrobush	AMDU2	*Ambrosia dumosa*	15–40	–
	creosote bush	LATRT	*Larrea tridentata var. tridentata*	15–40	–
	ocotillo	FOSP2	*Fouquieria splendens*	5–15	–
	white ratany	KRGR	*Krameria grayi*	5–15	–
5	**Misc. Shrubs**			5–10	
	burrobush	AMDU2	*Ambrosia dumosa*	15–40	–
	triangle bur ragweed	AMDE4	*Ambrosia deltoidea*	1–3	–
	San Felipe dogweed	ADPO	*Adenophyllum porophylloides*	0–1	–
	brittlebush	ENFA	*Encelia farinosa*	0–1	–
	littleleaf ratany	KRER	*Krameria erecta*	0–1	–
	desert-thorn	LYCIU	*Lycium*	0–1	–
	desert ironwood	OLTE	*Olneya tesota*	0–1	–
	woody crinklemat	TICAC	*Tiquilia canescens var. canescens*	0–1	–
	American threefold	TRCA8	*Trixis californica*	0–1	–
6	**Succulents**			10–15	
	buckhorn cholla	CYACA2	*Cylindropuntia acanthocarpa var. acanthocarpa*	0–1	–
	Arizona pencil cholla	CYAR14	*Cylindropuntia arbuscula*	0–1	–
	teddybear cholla	CYBI9	*Cylindropuntia bigelovii*	0–1	–
	Wiggins' cholla	CYEC3	*Cylindropuntia echinocarpa*	0–1	–
	Christmas cactus	CYLE8	*Cylindropuntia leptocaulis*	0–1	–
	branched pencil cholla	CYRA9	*Cylindropuntia ramosissima*	0–1	–
	Engelmann's hedgehog cactus	ECEN	*Echinocereus engelmannii*	0–1	–
	candy barrelcactus	FEWI	*Ferocactus wislizeni*	0–1	–
	globe cactus	MAMMI	*Mammillaria*	0–1	–
	beavertail pricklypear	OPBA2	*Opuntia basilaris*	0–1	–
Tree					

7	**Tree**			1–10	
	ocotillo	FOSP2	*Fouquieria splendens*	5–15	–
	yellow paloverde	PAMI5	*Parkinsonia microphylla*	1–10	–

Animal community

Within many large areas of this site are inclusions of better range sites (sand bottoms, loamy bottoms, sandy loam upland). In these instances, the entire area should be managed for the inclusions as they are producing nearly all the forage.

Forage production on this site is very low and management designed to maintain or improve the better sites associated with and adjacent to will benefit this site.

Wildlife found on this site are usually in transit to or from adjacent sites used for food and cover.

Recreational uses

Landform includes terraces, fans, and bajadas located at the base of desert mountains. These areas have a sparse cover of desert shrubs and cacti, with plants so evenly spaced they have the appearance of being planted in a symmetrical pattern. Very few days in the fall, winter or spring are too uncomfortable to enjoy outdoor activities, however, summer heat (Jun-Aug) in the afternoon causes restrictions. Horseback riding, hiking and photography are activities to which this site is suited.

Other products

A few of these soils are mined for their gravel content.

Type locality

Location 1: La Paz County, AZ	
Township/Range/Section	T1N R12W S2
General legal description	Eagle Tail Ranch

Contributors

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Unknown

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	
Approved by	
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:

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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:**
