

## Ecological site R040XC302AZ Limy Slopes 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.

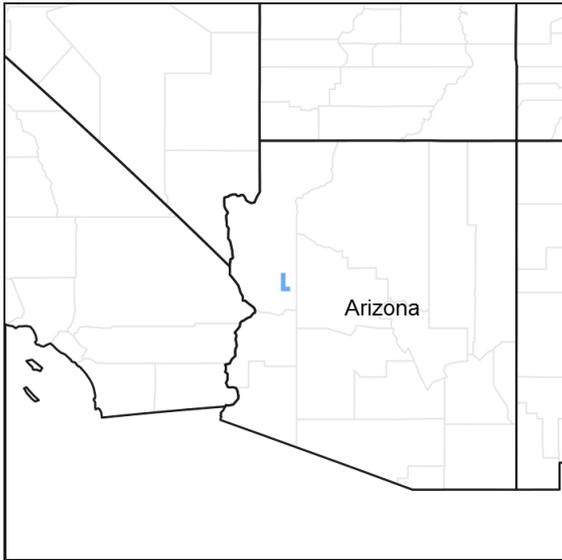


Figure 1. Mapped extent

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) <i>Parkinsonia microphylla</i>
Shrub	(1) <i>Larrea tridentata</i> var. <i>tridentata</i> (2) <i>Atriplex polycarpa</i>
Herbaceous	(1) <i>Pleuraphis rigida</i>

### Physiographic features

This site occurs as rough broken terraces, bordering drainageways and at the end of old alluvial fans. It does not benefit significantly from run-in moisture from adjacent areas. It suffers from excessive loss from runoff. It occurs on terrace escarpments and alluvial fans that are dissected by geologic erosion.

**Table 2. Representative physiographic features**

Landforms	(1) Terrace
Elevation	400–1,200 ft
Slope	1–50%

## 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 temperature 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 of 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 are deep to bedrock or other plant restricting layers. Surface soils range in texture from sand to clay with depths of 4-8 inches. Underlying layers have moderate to slow permeability, but can absorb and hold all moisture the climate provides. Soluble salt accumulation is high and pH is 7.9-8.4. With good vegetative cover, infiltration rates are moderate to slow. Stability against erosion processes is poor. Plant-soil moisture relationship is less than average. Percent coarse fragments range from 10-50% by total soil volume.

Soils mapped on this site include: in SSA-649 MU Torriorthents-30 and SSA-656 MU Torriorthents-4.

**Table 4. Representative soil features**

Surface texture	(1) Sand (2) Sandy clay (3) Clay
Permeability class	Moderate to slow

Soil depth	40–60 in
Surface fragment cover <=3"	10–50%
Soil reaction (1:1 water) (0-40in)	7.9–8.4

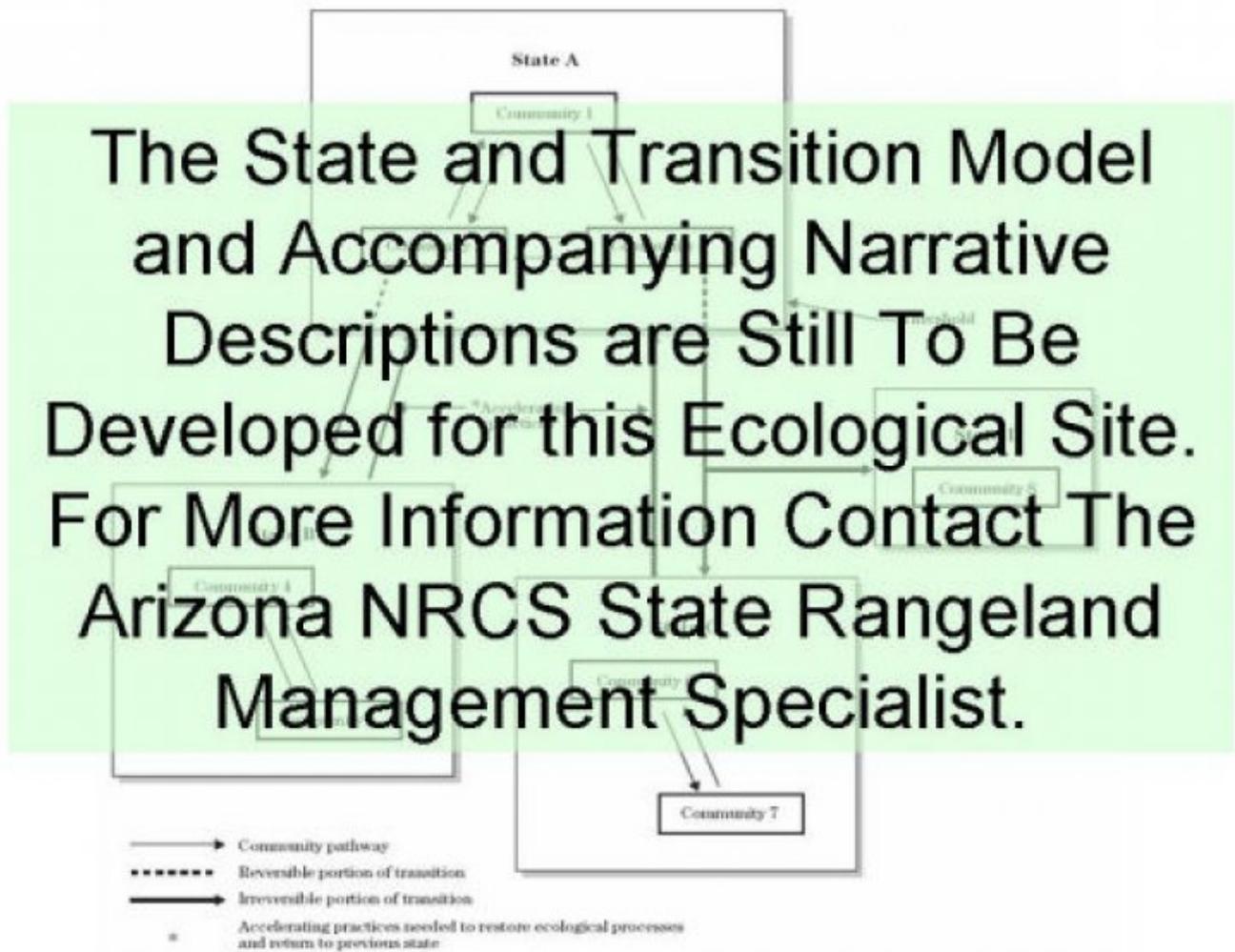
## Ecological dynamics

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



**State 1  
Historic Climax Plant Community**

**Community 1.1  
Historic Climax Plant Community**

The plant community on this site is predominantly desert shrubs and trees. Perennial grasses present are very drought-hardy and provide the majority of the livestock forage on the site. This site produces a fair amount of usable forage, however, being adjacent to the bottom, it usually is found in less than good condition. Continued use results in the loss of perennial grasses and forbs and an increase in woody plants.

Table 5. Annual production by plant type

Plant Type	Low (Lb/Acre)	Representative Value (Lb/Acre)	High (Lb/Acre)
Shrub/Vine	102	134	166
Grass/Grasslike	32	46	60
Forb	10	15	20
Tree	2	6	10
<b>Total</b>	<b>146</b>	<b>201</b>	<b>256</b>

Figure 5. Plant community growth curve (percent production by month). AZ3030, 40-3AZ 7-10" p.z. big galleta. Growth begins in the spring, goes dormant in May through June, most growth occurs during the summer rainy season..

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	0	10	10	0	0	15	55	10	0	0	0

Figure 6. 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 (%)
<b>Grass/Grasslike</b>					
1	<b>Dominant Grass</b>			30–50	
	big galleta	PLRI3	<i>Pleuraphis rigida</i>	30–50	–
2	<b>Misc. Grasses</b>			0–4	
	threeawn	ARIST	<i>Aristida</i>	0–2	–
	low woollygrass	DAPU7	<i>Dasyochloa pulchella</i>	0–2	–
3	<b>Annual Grasses</b>			2–6	
	sixweeks threeawn	ARAD	<i>Aristida adscensionis</i>	1–2	–
	needle grama	BOAR	<i>Bouteloua aristidoides</i>	1–2	–
	sixweeks grama	BOBA2	<i>Bouteloua barbata</i>	1–2	–
	sixweeks fescue	VUOC	<i>Vulpia octoflora</i>	1–2	–
<b>Forb</b>					
4	<b>Misc. Forbs</b>			10–20	
	buckwheat	ERIOG	<i>Eriogonum</i>	5–10	–
	globemallow	SPHAE	<i>Sphaeralcea</i>	4–8	–
	spurge	EUPHO	<i>Euphorbia</i>	2–4	–
	devil's spineflower	CHRI	<i>Chorizanthe rigida</i>	1–2	–
<b>Shrub/Vine</b>					
5	<b>Dominant Shrubs</b>			100–150	
	creosote bush	LATR7	<i>Larrea tridentata var. tridentata</i>	40–60	–
	cattle saltbush	ATPO	<i>Atriplex polycarpa</i>	30–40	–
	burrobush	AMDU2	<i>Ambrosia dumosa</i>	20–30	–
	white ratany	KRGR	<i>Krameria grayi</i>	10–20	–
	desert ironwood	OLTE	<i>Olneya tesota</i>	0–3	–
6	<b>Misc. Shrubs</b>			0–6	
	triangle bur ragweed	AMDE4	<i>Ambrosia deltoidea</i>	0–4	–
	desert-thorn	LYCIU	<i>Lycium</i>	0–4	–
7	<b>Succulents</b>			2–10	
	Arizona pencil cholla	CYAR14	<i>Cylindropuntia arbuscula</i>	1–5	–
	ocotillo	FOSP2	<i>Fouquieria splendens</i>	1–5	–
	hedgehog cactus	ECHIN3	<i>Echinocereus</i>	1–3	–
	candy barrelcactus	FEWI	<i>Ferocactus wislizeni</i>	1–2	–
<b>Tree</b>					
8	<b>Tree</b>			2–10	
	yellow paloverde	PAMI5	<i>Parkinsonia microphylla</i>	2–10	–
	desert ironwood	OLTE	<i>Olneya tesota</i>	0–4	–

## Animal community

This range site should be managed with the bottom sits as it occurs adjacent to these areas and has a much less forage potential. This site is very erosive where denuded.

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

## Recreational uses

Landform consists of bedlands or breaks along major deser drainageways. These areas have a sparse cover of desert shrubs. In places, ocotillo is prevalent enough to lend much to the aesthetics of these areas. Very few days in fall, spring or winter are too uncomfortable to enjoy outdoor activities. Afternoon heat in Jun-Sep restricts activity.

Horseback riding, wildlife observation, hunting, hiking and photography are the principle recreational activities on this stie.

## 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)	Dave Womack, Byron Lambeth, Dan Robinett, Emilio Carrillo
Contact for lead author	NRCS Tucson Area Office
Date	03/02/2005
Approved by	S. Cassady
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

## Indicators

1. **Number and extent of rills:** Common on this site.

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2. **Presence of water flow patterns:** Common on this site.

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3. **Number and height of erosional pedestals or terracettes:** Most plants have erosional pedestals. Terrasettes are uncommon.

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4. **Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):** 75-90%

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5. **Number of gullies and erosion associated with gullies:** Common on this site.

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6. **Extent of wind scoured, blowouts and/or depositional areas:** Common on this site.

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7. **Amount of litter movement (describe size and distance expected to travel):** All litter except for very large classes moves on this site.
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8. **Soil surface (top few mm) resistance to erosion (stability values are averages - most sites will show a range of values):** Expect ratings of 1-3 across the site.
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9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** Weak platy or single grain; color is 7.5-10YR6/4 Dry; 7.5-10YR4/4 moist; entisol - no A horizon.
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10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:** 5-10% canopy cover; shrubs 50-60%, subshrubs 20-30%, trees 5-10%, perennial grasses 1-2%.
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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):** None present 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: shrubs > subshrubs > tree > succulents > forbs = perennial grasses (Note, annual forbs and grasses may be greater than shrubs in El Nino years.)
- Sub-dominant:
- Other:
- Additional:
- 
13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):** 30-70% canopy mortality of trees & shrubs.
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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):** 146 lbs/ac unfavorable precipitation; 201 lbs/ac normal precipitation; 256 lb/ac favorable precipitation.
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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: Sahara mustard.**

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17. **Perennial plant reproductive capability:** Not impaired for shrubs & trees. Drought impaired for perennial grass & forbs.
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