

## **Ecological site R040XC303AZ** **Clayey Swale 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.

### 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>Prosopis velutina</i>
Shrub	(1) <i>Lycium</i>
Herbaceous	(1) <i>Pleuraphis mutica</i>

### Physiographic features

This site is always in a bottom position. It receives extra moisture from adjacent upland sites and rare floods. It occurs on floodplains, swales and active alluvial fans.

**Table 2. Representative physiographic features**

Landforms	(1) Flood plain (2) Swale (3) Alluvial fan
Elevation	75–1,000 ft
Slope	0–1%

### 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

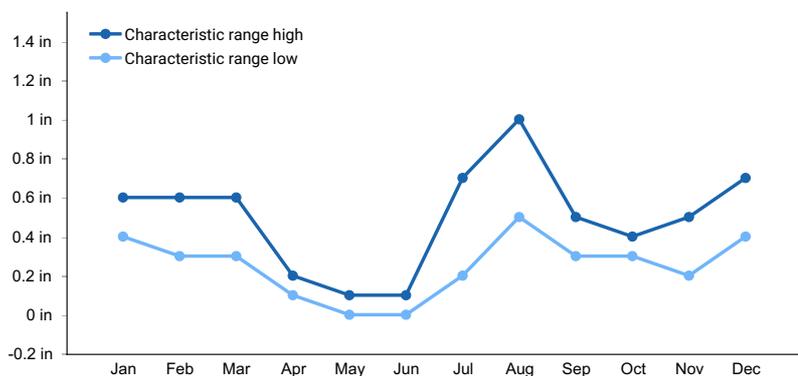
duration and low intensity. Snow is very rare and falls normally only in the higher mountains.

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.

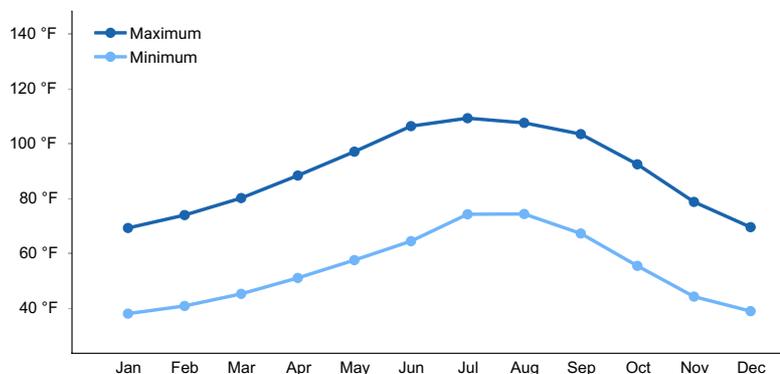
The site benefits from runin moisture in both spring and summer. The winter-spring precipitation is the most dependable on the site. Tobosa grass, the main species, grows actively year-round with available moisture. Most of the annual forbs are of the winter type.

**Table 3. Representative climatic features**

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



**Figure 1. Monthly precipitation range**



**Figure 2. Monthly average minimum and maximum temperature**

## Influencing water features

### Soil features

Soils are deep and clayey textured. They are montmorillonitic in nature with some cracking and churning as the wet and dry. Plant-soil moisture relationships are very good due to the extra moisture the site receives.

Soils mapped on this site include: SSA-649 MU's Holtville-12 and Kofa-17.

**Table 4. Representative soil features**

Surface texture	(1) Clay (2) Clay loam (3) Silty clay loam
Family particle size	(1) Clayey

Drainage class	Well drained
Permeability class	Very slow
Soil depth	60 in
Surface fragment cover <=3"	0%
Surface fragment cover >3"	0%
Available water capacity (0-40in)	8.4–10.8 in
Calcium carbonate equivalent (0-40in)	1–10%
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)	0%
Subsurface fragment volume >3" (Depth not specified)	0%

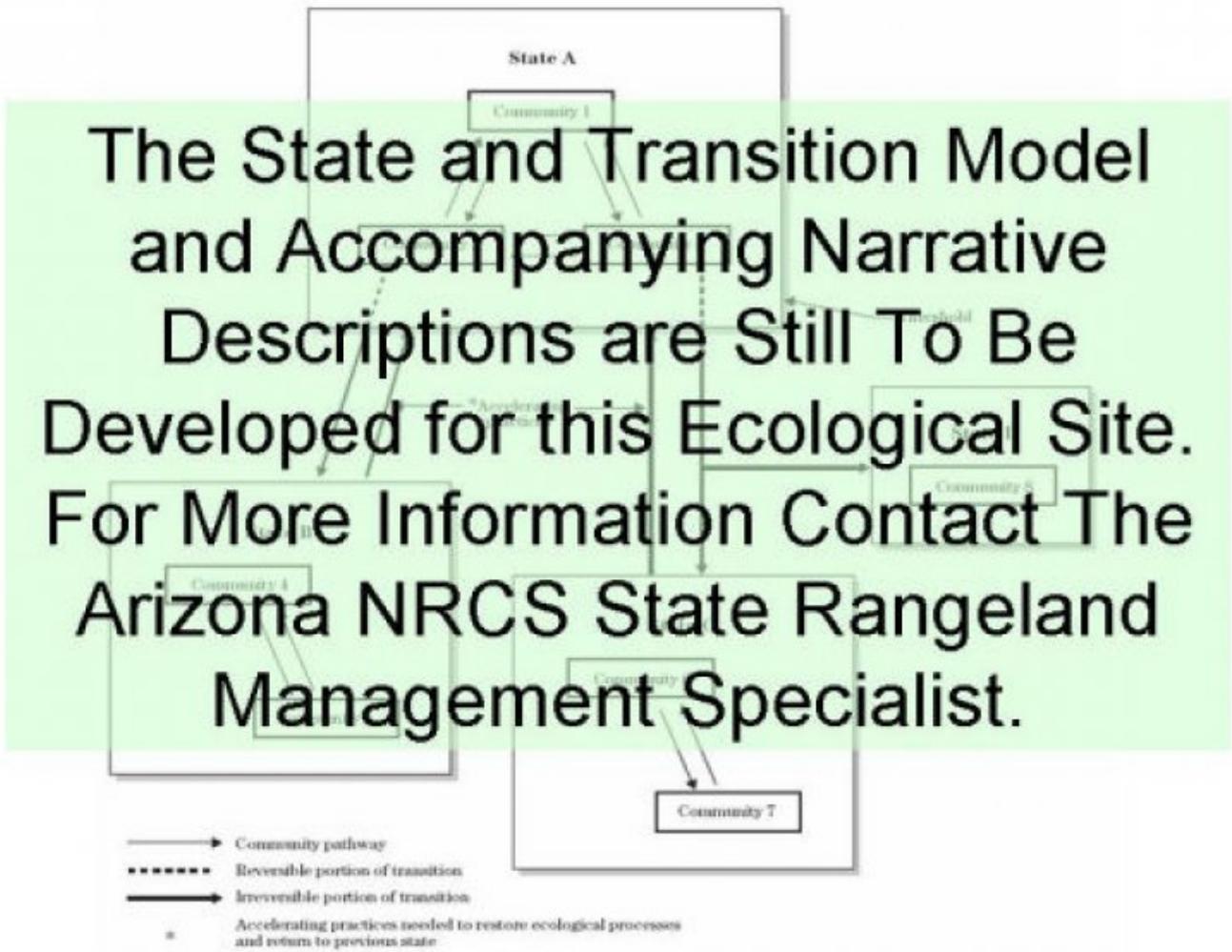
## Ecological dynamics

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



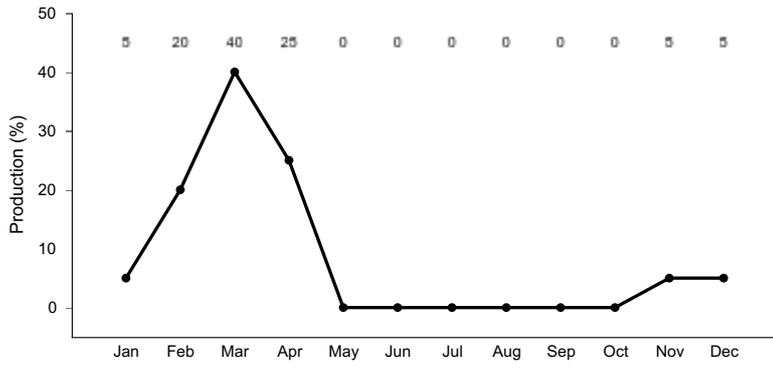
**State 1  
Historic Climax Plant Community**

**Community 1.1  
Historic Climax Plant Community**

The native plant community on this site is grassland with scattered shrubs and trees. Perennial and annual forbs are not abundant in the plant community. As the site deteriorates from overgrazing, woody species increase or invade to dominate the site, especially mesquite.

Table 5. Annual production by plant type

Plant Type	Low (Lb/Acre)	Representative Value (Lb/Acre)	High (Lb/Acre)
Grass/Grasslike	280	298	315
Shrub/Vine	18	26	35
Forb	17	27	35
<b>Total</b>	<b>315</b>	<b>351</b>	<b>385</b>



**Figure 4. 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..**

## 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>			280–315	
	tobosagrass	PLMU3	<i>Pleuraphis mutica</i>	280–315	–
2	<b>Misc. Grasses</b>			3–15	
	needle grama	BOAR	<i>Bouteloua aristidoides</i>	3–15	–
	sixweeks grama	BOBA2	<i>Bouteloua barbata</i>	3–15	–
	Arizona brome	BRAR4	<i>Bromus arizonicus</i>	3–15	–
	mucronate sprangeltop	LEPAB	<i>Leptochloa panicea ssp. brachiata</i>	3–15	–
	Bigelow's bluegrass	POBI	<i>Poa bigelovii</i>	3–15	–
	sixweeks fescue	VUOC	<i>Vulpia octoflora</i>	3–15	–
<b>Forb</b>					
3	<b>Misc. Forbs</b>			17–35	
	dwarf desertpeony	ACNA2	<i>Acourtia nana</i>	0–1	–
	weakleaf bur ragweed	AMCO3	<i>Ambrosia confertiflora</i>	0–1	–
	bristly fiddleneck	AMTE3	<i>Amsinckia tessellata</i>	0–1	–
	milkvetch	ASTRA	<i>Astragalus</i>	0–1	–
	hoary bowlesia	BOIN3	<i>Bowlesia incana</i>	0–1	–
	American wild carrot	DAPU3	<i>Daucus pusillus</i>	0–1	–
	bluedicks	DICA14	<i>Dichelostemma capitatum</i>	0–1	–
	fleabane	ERIGE2	<i>Erigeron</i>	0–1	–
	Indian rushpea	HOGL2	<i>Hoffmannseggia glauca</i>	0–1	–
	pepperweed	LEPID	<i>Lepidium</i>	0–1	–
	coastal bird's-foot trefoil	LOSAB	<i>Lotus salsuginosus var. brevivexillus</i>	0–1	–
	disc mayweed	MADI6	<i>Matricaria discoidea</i>	0–1	–
	Nuttall's povertyweed	MONU	<i>Monolepis nuttalliana</i>	0–1	–
	manybristle chinchweed	PEPA2	<i>Pectis papposa</i>	0–1	–
	desert Indianwheat	PLOV	<i>Plantago ovata</i>	0–1	–
	redseed plantain	PLRH	<i>Plantago rhodosperma</i>	0–1	–
	fanpetals	SIDA	<i>Sida</i>	0–1	–
	desert globemallow	SPAM2	<i>Sphaeralcea ambigua</i>	0–1	–
	Coulter's globemallow	SPCO2	<i>Sphaeralcea coulteri</i>	0–1	–
<b>Shrub/Vine</b>					
4	<b>Shrubs &amp; Succulents</b>			17–35	
	honey mesquite	PRGL2	<i>Prosopis glandulosa</i>	5–10	–
	desert-thorn	LYCIU	<i>Lycium</i>	2–5	–
	snakewood	CONDA	<i>Condalia</i>	2–5	–
	buckhorn cholla	CYACA2	<i>Cylindropuntia acanthocarpa var. acanthocarpa</i>	1–3	–
	Engelmann's hedgehog cactus	ECEN	<i>Echinocereus engelmannii</i>	1–3	–
	candy barrelcactus	FEWI	<i>Ferocactus wislizeni</i>	1–3	–
	crucifixion thorn	CAEM4	<i>Castela emoryi</i>	1–3	–

## Animal community

Due to seasonal availability of water and a long growing season, areas of this site are often overused. As these areas are quite productive, it is often economically feasible to develop water and fence them as special pastures. Many stock tanks built on this site have dried up portions of the site and contributed to gully erosion. This type of water development should be constructed at the lower end of these bottoms.

Being a grassland with occasional water, this site is an important feeding area for a wide variety of desert animals. Stockwater developments are very important to species using areas of the site.

## Recreational uses

This site is located on large relatively flat plains and alluvial fans. The site has an abundance of wildflowers following both good winter and summer rainy seasons. The mixture of grasses, trees and shrubs enhances the aesthetics of these areas. Very few days in the fall, winter or spring are too uncomfortable to enjoy outdoor activities. Afternoon heat restricts activity in Jun-Aug. Horseback riding, wildlife observation, hunting, hiking, photography, camping and picnicking are activities suited to the site.

## 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	
Approved by	
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

## Indicators

1. **Number and extent of rills:**

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2. **Presence of water flow patterns:**

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3. **Number and height of erosional pedestals or terracettes:**

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4. **Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not**

bare ground):

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5. **Number of gullies and erosion associated with gullies:**

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6. **Extent of wind scoured, blowouts and/or depositional areas:**

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7. **Amount of litter movement (describe size and distance expected to travel):**

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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):**

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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):**

- 
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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