USDA Natural Resources
Conservation Service

Ecological site R040XB223AZ
Clayey Upland, Saline 7"-10" p.z.

Accessed: 05/11/2025

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.

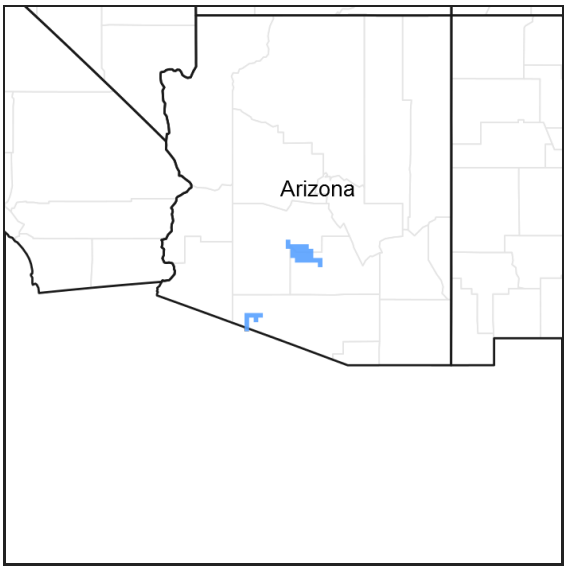


Figure 1. Mapped extent

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 40.2 – Middle Sonoran Desert

Elevations range from 1200 to 2000 feet and precipitation averages 7 to 10 inches per year. Vegetation includes saguaro, palo verde, creosotebush, triangle bursage, brittlebush, prickly pear, cholla, desert saltbush, wolfberry bush muhly, threeawns, 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	Not specified
Shrub	(1) *Sarcobatus vermiculatus* (2) *Atriplex canescens var. linearis*
Herbaceous	(1) *Distichlis spicata* (2) *Sporobolus airoides*

Physiographic features

This site occurs as nearly level stream terraces and relict basin floors.

Table 2. Representative physiographic features

Landforms	(1) Stream terrace (2) Basin floor
Elevation	1,000–2,000 ft
Slope	0–3%

Climatic features

Precipitation in the sub-resource area ranges from 7 to 10 inches. Elevations range from 900 to 2050 feet. Winter-summer rainfall ratios range from 40% to 60% in the southern part along the international boundary, to 60% to 40% in the central and northern parts of the sub-resource area. 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 38% at Florence and 46% at Aguila. Summer rains fall July- September, originate in the Gulf of Mexico, and are convective, usually brief, intense thunderstorms. Summer precipitation is extremely erratic and undependable in this area. Cool season moisture tends to be frontal, originates in the Pacific and Gulf of California, and falls in widespread storms with long duration and low intensity. This is the dependable moisture supply for vegetation in the area. Snow is very rare and usually melts on contact. May-June is the driest time of the year. Humidity is very low.

Winter temperatures are very mild with very few days recording freezing for short periods of time. Summertime temperatures are hot to very hot with many days in June-July exceeding 105 degrees F. Frost-free days range from 280 at stations in major river valleys with cold air drainage to 320 to 350 days at upland stations.

Both the spring and the summer growing seasons are equally important for perennial grass, forb and shrub growth. Cool and warm season annual forbs and grasses can be common in their respective seasons with above average rainfall. Perennial forage species can remain green throughout the year with available moisture.

Table 3. Representative climatic features

Frost-free period (average)	350 days
Freeze-free period (average)	0 days
Precipitation total (average)	10 in

Influencing water features

Soil features

These soils are deep, well-drained saline and sodic soils. They are stratified silty to clayey soils that have a strongly saline layer near the surface. Subsurface texture group may include fine silty. Plant-soil moisture relationships are poor. Slow infiltration rates and saline-sodic conditions limit the amount of water available for plant growth.

Soils mapped on this site include: SSA-658 Gila River Indian Reservation MU's Casa Grande clay loam-6 & 7, Kamato-20, Yahana-35, 37 & 38.

Table 4. Representative soil features

Surface texture	(1) Clay loam (2) Silty clay loam
Family particle size	(1) Loamy
Drainage class	Well drained

Permeability class	Moderately slow
Soil depth	60 in
Surface fragment cover <=3"	0%
Surface fragment cover >3"	0%
Available water capacity (0-40in)	9–10.8 in
Calcium carbonate equivalent (0-40in)	5–35%
Electrical conductivity (0-40in)	1–16 mmhos/cm
Sodium adsorption ratio (0-40in)	13–30
Soil reaction (1:1 water) (0-40in)	8.4–11
Subsurface fragment volume <=3" (Depth not specified)	0%
Subsurface fragment volume >3" (Depth not specified)	0%

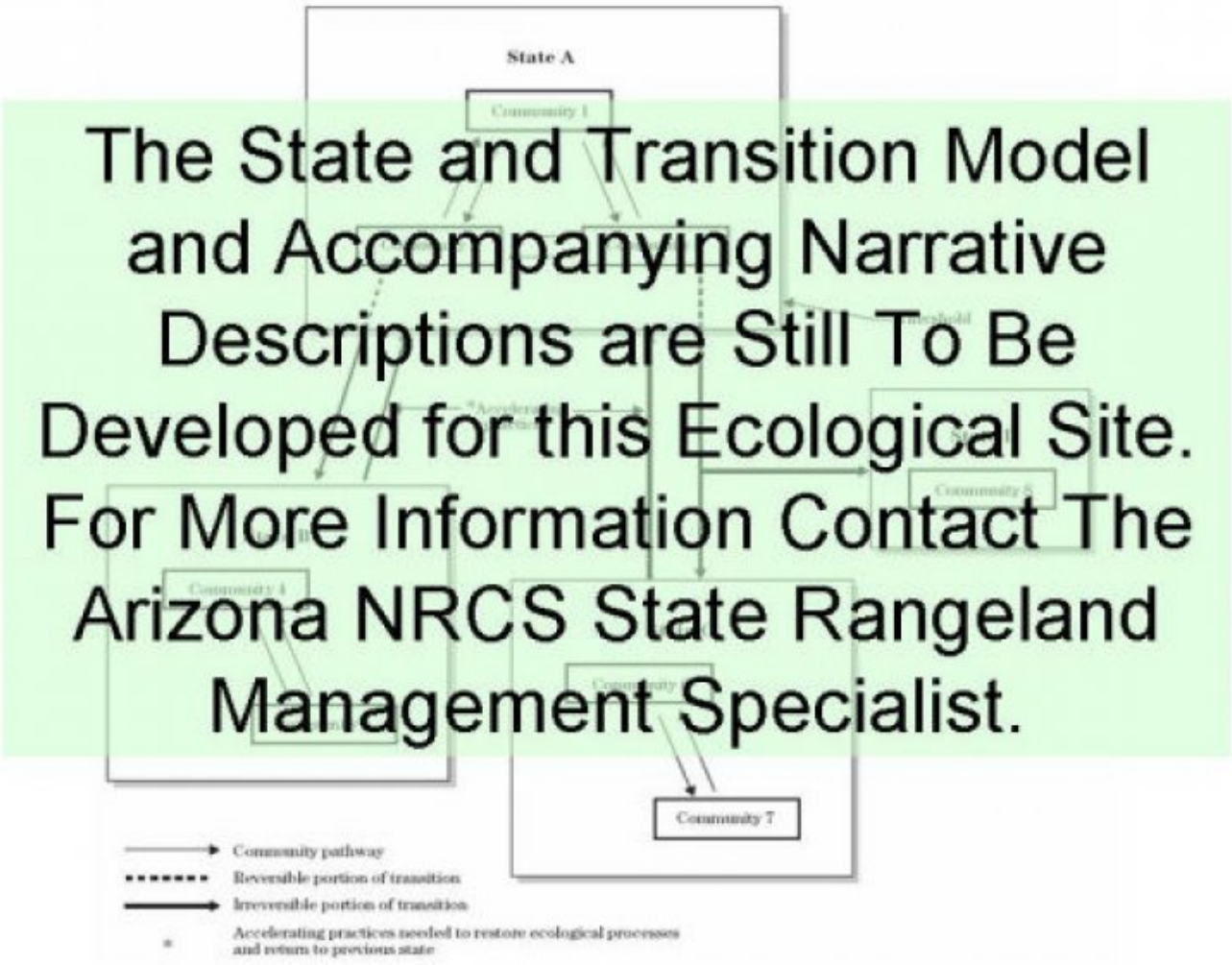
Ecological dynamics

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 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



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 native plant community on this site is a mixture of salt desert shrub species. Perennial and annual grasses and forbs exist in trace amounts on the site. With severe disturbance such as fire, heavy continuous grazing, or severe flooding akk plant cover can be lost on this site.

Table 5. Annual production by plant type

Plant Type	Low (Lb/Acre)	Representative Value (Lb/Acre)	High (Lb/Acre)
Shrub/Vine	255	270	285
Forb	3	10	15
Grass/Grasslike	3	10	15
Total	**261**	**290**	**315**

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				3–9	
	saltgrass	DISP	*Distichlis spicata*	0–1	–
	alkali sacaton	SPAI	*Sporobolus airoides*	0–1	–
2				3–6	
	sixweeks threeawn	ARAD	*Aristida adscensionis*	0–1	–
	Arizona brome	BRAR4	*Bromus arizonicus*	0–1	–
	little barley	HOPU	*Hordeum pusillum*	0–1	–
	Mexican sprangletop	LEFUU	*Leptochloa fusca ssp. uninervia*	0–1	–
	sticky sprangletop	LEVI5	*Leptochloa viscida*	0–1	–
	littleseed muhly	MUMI	*Muhlenbergia microsperma*	0–1	–
	Bigelow's bluegrass	POBI	*Poa bigelovii*	0–1	–
	sixweeks fescue	VUOC	*Vulpia octoflora*	0–1	–
Forb					
3				3–15	
	wheelscale saltbush	ATEL	*Atriplex elegans*	0–1	–
	wheelscale saltbush	ATELF	*Atriplex elegans var. fasciculata*	0–1	–
	aridland goosefoot	CHDE	*Chenopodium desiccatum*	0–1	–
	Nuttall's povertyweed	MONU	*Monolepis nuttalliana*	0–1	–
	desert Indianwheat	PLOV	*Plantago ovata*	0–1	–
	Coulter's globemallow	SPCO2	*Sphaeralcea coulteri*	0–1	–
Shrub/Vine					
4				225–255	
	iodinebush	ALOC2	*Allenrolfea occidentalis*	203–230	–
	fourwing saltbush	ATCAL2	*Atriplex canescens var. laciniata*	203–230	–
	greasewood	SAVE4	*Sarcobatus vermiculatus*	203–230	–
	seepweed	SUAED	*Suaeda*	203–230	–
5				3–30	
	fourwing saltbush	ATCA2	*Atriplex canescens*	3–27	–
	cattle saltbush	ATPO	*Atriplex polycarpa*	3–27	–
	alkali goldenbush	ISACA2	*Isocoma acradenia var. acradenia*	3–27	–
	water jacket	LYAN	*Lycium andersonii*	3–27	–
	Torrey wolfberry	LYTO	*Lycium torreyi*	3–27	–
	honey mesquite	PRGLG	*Prosopis glandulosa var. glandulosa*	3–27	–

Animal community

This site is only suited to grazing in the winter-spring period when the salt desert shrub species make their yearly growth of twigs and leaves. Although energy is always lacking on this site, it is usually associated with bottom sites where herbaceous sites are present during the spring. Proper use should be no more than 50% of the spring growth on the shrub species present. Livestock water developments are very important on this site.

Poor cover and very poor forage species diversity make this site unsuitable for wildlife habitat. Its association with bottom sites makes it, at best, a minor forage area for desert mammals.

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, Dan Robinett, Emilio Carrillo
Contact for lead author	Water flow patterns are common and cover 15-20% of area.
Date	03/07/2005
Approved by	S.
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

Indicators

1. **Number and extent of rills:** Rills can be present on the site but are discontinuous due to low slopes.

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2. **Presence of water flow patterns:** Water flow patterns are common and cover 15-20% of the area.

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3. **Number and height of erosional pedestals or terracettes:** All shrubs have symmetrical mounds 2-5 inches tall formed by combined action of splash and erosion. There are no pedestals on rock or gravel fragments and no terracettes are present.

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4. **Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):** 60-70% in dry years.

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5. **Number of gullies and erosion associated with gullies:** none

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6. **Extent of wind scoured, blowouts and/or depositional areas:** No evidence of soil movement by wind.

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7. **Amount of litter movement (describe size and distance expected to travel):** Herbaceous litter can move by wind and water. Woody litter remains under shrub canopies.

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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): Soil surface resistance to erosion is good under shrub canopies to moderate in interspaces due to crusts formed by raindrop impact.

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9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** Weak thir platy to granular; 7.5-10YR6/4 dry, 7.5-10YR4/4 moist; to 1 inch thick.

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10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:** Canopy 10-15%: 70-80% shrubs, 5% trees, 10-15% succulents. Cover is well dispersed throughout site.

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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

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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: subshrubs > large shrubs > winter annuals > summer annuals > perennial grasses and forbs > cryptogams

    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):** 0-5% canopy mortality

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14. **Average percent litter cover (%) and depth (in):** Herbaceous litter is not persistent on the site.

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15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):** 200 lbs/ac unfavorable precipitation, 300 lbs/ac normal years, 400 lbs/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 (potential), salt cedar

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17. **Perennial plant reproductive capability:** Not impaired for shrubs, drought impaired for perennial grasses and forbs