

Ecological site R040XB225AZ

Loamy Upland, Saline

7"-10" 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 40.2 – 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) <i>Atriplex polycarpa</i> (2) <i>Atriplex canescens</i> var. <i>linearis</i>
Herbaceous	(1) <i>Sporobolus airoides</i> (2) <i>Muhlenbergia porteri</i>

Physiographic features

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

Table 2. Representative physiographic features

Landforms	(1) Stream terrace (2) Basin floor
Elevation	310 – 630 m
Slope	0 – 10 %

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)	250 mm

Influencing water features

Soil features

Soils are deep, well drained saline and sodic soils. They are loamy to clayey with a surface of silt loam to loam. Surface texture may be clayloam. Subsurface texture may be fine silty, fine, fine or coarse loamy. Included are soils with a cap of fine sandy loam, but with textural change to heavier horizons at less than 20". Plant-soil moisture relationships are fair. Water infiltration rates are good, but saline-sodic conditions limit the amount of soil moisture available for plant growth. This site is mapped in 6 Soil Survey areas in Southwestern Arizona in the CRA D40-2.

Soils mapped on this site include: SSA-645 Aguila-Carefree area MU Sal-106; SSA-651 Central Maricopa county MU Casa Grande-Cg, Ch, Ck & Cm, Estrella-Et, Harqua-HAB, HAC, HLC, HM, HrB & RhB, La Palma-La & PvB, Laveen (saline)-Cm, Ld & Lf, and Perryville-Pb; SSA-658 Gila River Indian Reservation MU's Casa Grande-7, 8 & 30, Dateland (saline)-12, Indio (unflooded)-18, 19 & 37, Kamato (unflooded)-20 & 21, Laveen (saline)-23, Tatai (unflooded)-33; SSA-659 Western Pinal county MU's Casa Grande-3 & 4, Dateland (saline)-14, La Palma-27, Toltec (saline)-43; SSA-661 Eastern Pinal-Southern Gila counties MU Casa Grande-860; SSA-703 Tohono O'odham MU Casa Grande-8 & 9.

Table 4. Representative soil features

Surface texture	(1) Loam (2) Silt loam (3) Silty clay loam
Family particle size	(1) Loamy
Drainage class	Well drained
Permeability class	Very slow to moderately rapid

Soil depth	150 cm
Surface fragment cover <=3"	0 – 10 %
Surface fragment cover >3"	Not specified
Available water capacity (0-101.6cm)	24.38 – 28.96 cm
Calcium carbonate equivalent (0-101.6cm)	0 – 10 %
Electrical conductivity (0-101.6cm)	0 – 20 mmhos/cm
Sodium adsorption ratio (0-101.6cm)	10 – 30
Soil reaction (1:1 water) (0-101.6cm)	7.9 – 10
Subsurface fragment volume <=3" (Depth not specified)	0 – 10 %
Subsurface fragment volume >3" (Depth not specified)	Not specified

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

Additional community tables

Table 5. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
Grass/Grasslike					
1				9-45	
	sixweeks threeawn	ARAD	<i>Aristida adscensionis</i>	0-2	–
	Havard's threeawn	ARHA3	<i>Aristida havardii</i>	0-2	–
	prairie threeawn	AROL	<i>Aristida oligantha</i>	0-2	–
	spidergrass	ARTE3	<i>Aristida ternipes</i>	0-2	–
	needle grama	BOAR	<i>Bouteloua aristidoides</i>	0-2	–
	sixweeks grama	BOBA2	<i>Bouteloua barbata</i>	0-2	–
	Rothrock's grama	BORO2	<i>Bouteloua rothrockii</i>	0-2	–
	feather fingergrass	CHVI4	<i>Chloris virgata</i>	0-2	–
	tufted lovegrass	ERPEP2	<i>Eragrostis pectinacea</i> var. <i>pectinacea</i>	0-2	–
	little barley	HOPU	<i>Hordeum pusillum</i>	0-2	–
	Mexican sprangletop	LEFUU	<i>Leptochloa fusca</i> ssp. <i>uninervia</i>	0-2	–
	mucronate sprangletop	LEPAB	<i>Leptochloa panicea</i> ssp. <i>brachiata</i>	0-2	–
	littleseed muhly	MUMI	<i>Muhlenbergia microsperma</i>	0-2	–
	bush muhly	MUPO2	<i>Muhlenbergia porteri</i>	0-2	–
	Bigelow's bluegrass	POBI	<i>Poa bigelovii</i>	0-2	–
	alkali sacaton	SPAI	<i>Sporobolus airoides</i>	0-2	–
	sixweeks fescue	VUOC	<i>Vulpia octoflora</i>	0-2	–
Forb					
2				9-22	
	desert Indianwheat	PLOV	<i>Plantago ovata</i>	9-22	–
3				9-45	
	weakleaf bur ragweed	AMCO3	<i>Ambrosia confertiflora</i>	0-3	–
	fringed amaranth	AMFI	<i>Amaranthus fimbriatus</i>	0-3	–
	common fiddleneck	AMMEI2	<i>Amsinckia menziesii</i> var. <i>intermedia</i>	0-3	–
	wheelscale saltbush	ATEL	<i>Atriplex elegans</i>	0-3	–
	wheelscale saltbush	ATELF	<i>Atriplex elegans</i> var. <i>fasciculata</i>	0-3	–
	Coulter's spiderling	BOCO2	<i>Boerhavia coulteri</i>	0-3	–
	hoary bowlesia	BOIN3	<i>Bowlesia incana</i>	0-3	–
	yellow tackstem	CAPA7	<i>Calycoseris parryi</i>	0-3	–
	white tackstem	CAWR	<i>Calycoseris wrightii</i>	0-3	–
	aridland goosefoot	CHDE	<i>Chenopodium desiccatum</i>	0-3	–
	cryptantha	CRYPT	<i>Cryptantha</i>	0-3	–
	American wild carrot	DAPU3	<i>Daucus pusillus</i>	0-3	–
	miniature woollystar	ERDI2	<i>Eriastrum diffusum</i>	0-3	–
	Gordon's bladderpod	LEGO	<i>Lesquerella gordonii</i>	0-3	–

	pepperweed	LEPID	<i>Lepidium</i>	0-3	–
	coastal bird's-foot trefoil	LOSA	<i>Lotus salsuginosus</i>	0-3	–
	Coulter's lupine	LUSP2	<i>Lupinus sparsiflorus</i>	0-3	–
	Nuttall's povertyweed	MONU	<i>Monolepis nuttalliana</i>	0-3	–
	combseed	PECTO	<i>Pectocarya</i>	0-3	–
	phacelia	PHACE	<i>Phacelia</i>	0-3	–
	New Mexico plumeseed	RANE	<i>Rafinesquia neomexicana</i>	0-3	–
	canaigre dock	RUHY	<i>Rumex hymenosepalus</i>	0-3	–
	sleepy silene	SIAN2	<i>Silene antirrhina</i>	0-3	–
	Coulter's globemallow	SPCO2	<i>Sphaeralcea coulteri</i>	0-3	–
	woollyhead neststraw	STMI2	<i>Stylocline micropoides</i>	0-3	–
	woolly tidestromia	TILA2	<i>Tidestromia lanuginosa</i>	0-3	–
Shrub/Vine					
4				229-305	
	thinleaf fourwing saltbush	ATCAL4	<i>Atriplex canescens var. linearis</i>	229-305	–
	cattle saltbush	ATPO	<i>Atriplex polycarpa</i>	229-305	–
5				38-76	
	iodinebush	ALOC2	<i>Allenrolfea occidentalis</i>	38-76	–
	fourwing saltbush	ATCA2	<i>Atriplex canescens</i>	38-76	–
	water jacket	LYAN	<i>Lycium andersonii</i>	38-76	–
	Arizona desert-thorn	LYEX	<i>Lycium exsertum</i>	38-76	–
	Torrey wolfberry	LYTO	<i>Lycium torreyi</i>	38-76	–
	mesquite	PRJU3	<i>Prosopis juliflora</i>	38-76	–
	seepweed	SUAED	<i>Suaeda</i>	38-76	–
6	Succulents			19-38	
	Engelmann's hedgehog cactus	ECEN	<i>Echinocereus engelmannii</i>	19-38	–
	candy barrelcactus	FEWI	<i>Ferocactus wislizeni</i>	19-38	–

Animal community

This site produces forage for year-round use by livestock. Salt desert shrub species will provide adequate protein throughout the year, however energy will usually be lacking on this site from Jun-Jan (except when summer rainfall is sufficient to produce a crop of summer annual grasses and forbs). Spring is the main season for shrub growth and production of annual species. Proper use of the shrubs should be no more than 50% of the spring production of leaves and twigs. Water developments are very important on this site and grazing can be controlled by livestock access to water. The lack of natural water and poor cover limits the value of this site for wildlife habitat. Large areas of this site have no inclusions of washes or bottom sites needed for cover for the larger mammals. Forage diversity is poor; it is mainly a forage site for birds and desert mammals.

Other information

T&E Species: Tumamoc globe berry (*Tumamoca macdougalii*) and Sonoran pronghorn (*Antilocapra Americana Sonoriensis*)

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)	Dave Womack, Dan Robinett, Emilio Carrillo
Contact for lead author	NRCS Tucson Area Office
Date	03/07/2005
Approved by	
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

Indicators

1. **Number and extent of rills:** None present due to high slopes.

2. **Presence of water flow patterns:** Water flow patterns are common, but discontinuous and empty into mini-playa areas due to low slopes.

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

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

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

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

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.

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.

9. Soil surface structure and SOM content (include type of structure and A-horizon color and thickness): Weak thin platy to granular; 7.5-10YR6/4 dry, 7.5-10YR4/4 moist, to 5 inches thick

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 the site.

11. Presence and thickness of compaction layer (usually none; describe soil profile features which may be mistaken for compaction on this site): None

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 > winter annuals > trees > summer annuals > succulents = perennial grasses and forbs > cryptogams

Sub-dominant:

Other:

Additional:

13. Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence): 0-50% canopy mortality; 90-100% perennial grass mortality.

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

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.

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), schismus, filaree

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