USDA Natural Resources Conservation Service

Ecological site R041XB205AZ
Shallow Hills 8-12" p.z.

Last updated: 4/12/2021
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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.

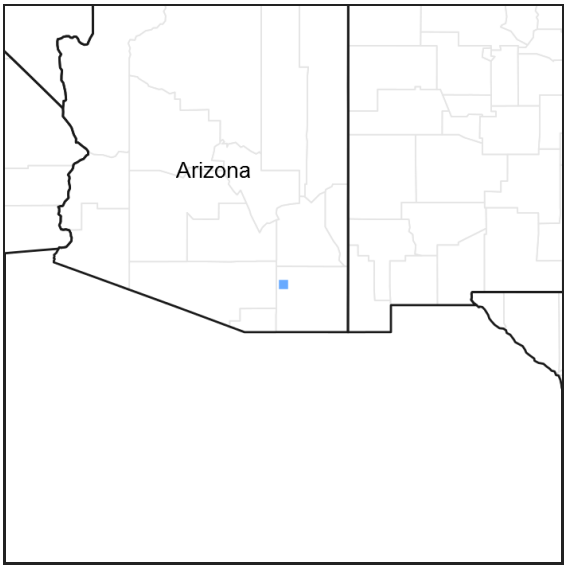

Figure 1. Mapped extent

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): 041X–Madrean Archipelago

AZ 41.2 – Chihuahuan – Sonoran Desert Shrubs

Elevations range from 2600 to 4000 feet and precipitation ranges from 8 to 12 inches per year. Vegetation includes mesquite, palo verde, catclaw acacia, soaptree yucca, creosotebush, whitethorn, staghorn cholla, desert saltbush, Mormon tea, burroweed, snakeweed, tobosa, black grama, threeawns, bush muhly, dropseed, and burrograss. The soil temperature regime is thermic 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	Not specified
Herbaceous	Not specified

Physiographic features

This site occurs in the lowest elevations of the Madrean Basin and Range province in southeastern Arizona. It occurs on steep hill-slopes with a rough appearance. Boulders and rock outcrops tend to hide the range site.

Table 2. Representative physiographic features

Landforms	(1) Hill (2) Mountain
Flooding frequency	None
Ponding frequency	None
Elevation	792–1,219 m
Slope	15–65%
Aspect	N, E, S

Climatic features

Precipitation ranges from 8-12 inches annually. More than half falls during Jul-Sep in brief, but often heavy, thunderstorms. The rest of the moisture comes as light rain or snow that falls slowly for a day or more, but rarely lasts more than a day. May and June are normally the driest months. Humidity is generally very low.

Temperatures are mild throughout most of the year. Freezing temperatures are common at night Dec-Feb; brief 0 F may be observed some nights. During June, July & August, some days may exceed 100 F.

In years of average or greater winter precipitation, annual grasses and forbs occur abundantly in the interspaces.

Table 3. Representative climatic features

Frost-free period (average)	240 days
Freeze-free period (average)	
Precipitation total (average)	

Influencing water features

Soil features

Soils are shallow and very shallow; developed in place on granite and related rocks. They are very gravelly and cobbly both in the profile and on the surface. They have moderately rapid infiltration rates with low water-holding capacity. Plant-soil moisture relationship are good due to runoff from the adjacent rock outcrops.

Soil series mapped to date on this site include: SSA-662 Safford area MU's ClF Cellar and SSA-666 Cochise County Northwest part MU 86 Wikiup family & Anklam.

Table 4. Representative soil features

Parent material	(1) Slope alluvium–granite
Surface texture	(1) Very gravelly sandy loam (2) Very cobbly sandy loam (3) Gravelly sandy loam
Family particle size	(1) Loamy
Drainage class	Well drained
Permeability class	Moderately rapid to moderate

Soil depth	13–51 cm
Surface fragment cover <=3"	30–60%
Surface fragment cover >3"	5–25%
Available water capacity (0-101.6cm)	1.52–8.13 cm
Calcium carbonate equivalent (0-101.6cm)	0–5%
Electrical conductivity (0-101.6cm)	0–2 mmhos/cm
Sodium adsorption ratio (0-101.6cm)	0–2
Soil reaction (1:1 water) (0-101.6cm)	7.4–8
Subsurface fragment volume <=3" (Depth not specified)	35–65%
Subsurface fragment volume >3" (Depth not specified)	0–10%

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

This range site has a plant community dominated by grass. The small trees and shrubs give it a slight brushy aspect. As this site deteriorates, oak, burroweed, broom snakeweed and other woody or weedy species increase or invade. Washes on or below the site carry heavy sediment loads when this site deteriorates. However, in excellent condition, the erosion is very slight.

Table 5. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Grass/Grasslike	549	588	628
Shrub/Vine	39	78	118
Total	**588**	**666**	**746**

Additional community tables

Table 6. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Kg/Hectare)	Foliar Cover (%)
Grass/Grasslike					
1				50–80	

1				59–89	
	blue grama	BOGR2	*Bouteloua gracilis*	59–89	–
	hairy grama	BOHI2	*Bouteloua hirsuta*	59–89	–
2				74–123	
	tobosagrass	PLMU3	*Pleuraphis mutica*	123–173	–
	crinkleawn grass	TRACH2	*Trachypogon*	59	–
	slim tridens	TRMU	*Tridens muticus*	59	–
	threeawn	ARIST	*Aristida*	59	–
	cane bluestem	BOBA3	*Bothriochloa barbinodis*	59	–
	sprucetop grama	BOCH	*Bouteloua chondrosioides*	59	–
	sideoats grama	BOCU	*Bouteloua curtipendula*	59	–
	black grama	BOER4	*Bouteloua eriopoda*	59	–
	slender grama	BORE2	*Bouteloua repens*	59	–
	plains lovegrass	ERIN	*Eragrostis intermedia*	59	–
	curly-mesquite	HIBE	*Hilaria belangeri*	59	–
	bush muhly	MUPO2	*Muhlenbergia porteri*	59	–
3				30	
	threeawn	ARIST	*Aristida*	30	–
	Rothrock's grama	BORO2	*Bouteloua rothrockii*	30	–
	Arizona cottontop	DICA8	*Digitaria californica*	30	–
	woolyspike balsamscale	ELBA	*Elionurus barbiculmis*	30	–
	tanglehead	HECO10	*Heteropogon contortus*	30	–
	green sprangletop	LEDU	*Leptochloa dubia*	30	–
	common wolfstail	LYPH	*Lycurus phleoides*	30	–
	bullgrass	MUEM	*Muhlenbergia emersleyi*	30	–
	Texas bluestem	SCCI2	*Schizachyrium cirratum*	30	–
	plains bristlegrass	SEVU2	*Setaria vulpiseta*	30	–
Shrub/Vine					
4				8	
	whitethorn acacia	ACCO2	*Acacia constricta*	8	–
	agave	AGAVE	*Agave*	8	–
	fairyduster	CAER	*Calliandra eriophylla*	8	–
	ratany	KRAME	*Krameria*	8	–
	sensitive plant	MIMOS	*Mimosa*	8	–
	pricklypear	OPUNT	*Opuntia*	8	–
	soaptree yucca	YUEL	*Yucca elata*	8	–
5				4	
	threeawn	ARIST	*Aristida*	25	–
	Rothrock's grama	BORO2	*Bouteloua rothrockii*	25	–
	curly-mesquite	HIBE	*Hilaria belangeri*	25	–
	burrograss	SCBR2	*Scleropogon brevifolius*	25	–
	dropseed	SPORO	*Sporobolus*	25	–
	catclaw acacia	ACGR	*Acacia greggii*	4	–
	cassia	CASSI	*Cassia*	4	–

	common sotol	DAWH2	*Dasylirion wheeleri*	4	–
	longleaf jointfir	EPTR	*Ephedra trifurca*	4	–
	coralbean	ERFL7	*Erythrina flabelliformis*	4	–
	bastardsage	ERWR	*Eriogonum wrightii*	4	–
	ocotillo	FOSP2	*Fouquieria splendens*	4	–
	Thurber's cotton	GOTH	*Gossypium thurberi*	4	–
	winterfat	KRLA2	*Krascheninnikovia lanata*	4	–
	Emory oak	QUEM	*Quercus emoryi*	4	–
	skunkbush sumac	RHTR	*Rhus trilobata*	4	–
	jojoba	SICH	*Simmondsia chinensis*	4	–

Animal community

Cattle use the accessible parts of the site readily, and due to the unusually narrow lanes of accessibility, small rills erode along their trails and the soil is frequently removed to bedrock.

Limited numbers of springs, seeps and permanent streams occur on this site. Runoff from nearby rocks is a source of water when trapped in depressions.

Rock outcrops and boulders break up the site and are not considered part of the site, but provide cover for wildlife. Mast from oak, browse from shrubs and forba provide food for several species of wildlife. Cover for escape, nesting, and resting is easily found for small mammals and birds, as well as larger mammals.

Recreational uses

Huge round boulders form rock piles on the site and give the area a rugged appearance. The wide variety of plants provides good aesthetic appeal. Plants such as ocotillo, yucca and coral-bean lend color to the site. Although a few winter days aer cold and some summer days are hot, most of the year is very comfortable. Activities include wildlife observations, horseback riding, hunting, hiking, photography, nature studies, picnicking and camping.

Type locality

Location 1: Cochise County, AZ	
Township/Range/Section	T15S R20E S20
General legal description	USGS Quadrangle—Galleta Flat East; about 1,100 feet west and 1,300 feet south of the northeast corner of section 20, Township 15 south, Range 20 east

Contributors

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Approval

Curtis Talbot, 4/12/2021

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	05/12/2025
Approved by	Curtis Talbot
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):

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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):**

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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:**
