

Ecological site R041XB214AZ

Sandy Upland 8-12" 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.

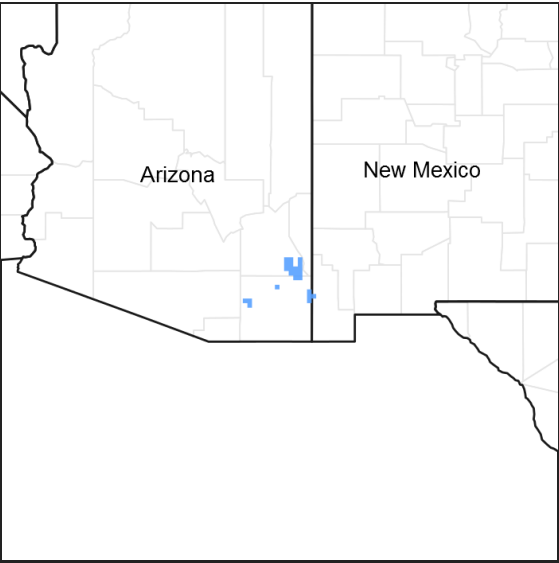


Figure 1. Mapped extent

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): 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	(1) <i>atriplex canescens</i> (2) <i>yucca elata</i>

Herbaceous	(1) <i>sporobolus contractus</i> (2) <i>sporobolus flexuosus</i>
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Physiographic features

This site occurs in the lowest elevations of the Madrean Basin and Range province in southeastern Arizona. It occurs on generally level to gently undulating plains and low stabilized dunes on the lee side of major drainages.

Table 2. Representative physiographic features

Landforms	(1) Plain (2) Dune
Flooding frequency	None
Ponding frequency	None
Elevation	792–1,219 m
Slope	1–15%
Aspect	Aspect is not a significant factor

Climatic features

Precipitation ranges from 8-12 inches annually. More than half falls during July-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 deep, somewhat excessively drained. They are loamy sand throughout and have low available water capacities with rapid intake and permeability rates. These soils may or may not be slightly calcareous. They are eolian in nature and are subject to wind movement.

Soil Series mapped on this site include: SSA-664 San Simon area Mu's 6 7 & 21 Bluepoint; SSA-666 Cochise county Northwest part MU's 87 & 88 Yana.

Table 4. Representative soil features

Surface texture	(1) Loamy sand (2) Sand
Family particle size	(1) Sandy
Drainage class	Somewhat excessively drained to well drained
Permeability class	Very rapid to rapid

Soil depth	152 cm
Surface fragment cover <=3"	0–5%
Surface fragment cover >3"	0%
Available water capacity (0-101.6cm)	5.08–12.7 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)	7–8
Subsurface fragment volume <=3" (Depth not specified)	0–5%
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 climax vegetation is made up predominantly of warm season grasses with a mixture of forb and shrub species. Plants likely to invade or increase on this site following prolonged overgrazing by livestock are broom snakeweed, cacti, burroweed and mesquite. Continuous use during summer and fall will cause the warm season grasses to decline. Lower forage value grasses and shrubs will increase or invade to fill the void.

Table 5. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Grass/Grasslike	269	291	314
Shrub/Vine	90	112	135
Forb	45	67	90
Total	404	470	539

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				29–58	
	spike dropseed	SPCO4	<i>Sporobolus contractus</i>	29–58	–
	mesa dropseed	SPFL2	<i>Sporobolus flexuosus</i>	29–58	–
2				15–58	
	threeawn	ARIST	<i>Aristida</i>	15–58	–
	black grama	BOER4	<i>Bouteloua eriopoda</i>	15–58	–
	Arizona cottontop	DICA8	<i>Digitaria californica</i>	15–58	–
	bush muhly	MUPO2	<i>Muhlenbergia porteri</i>	15–58	–
	giant dropseed	SPGI	<i>Sporobolus giganteus</i>	15–58	–
3				0–15	
	sideoats grama	BOCU	<i>Bouteloua curtipendula</i>	0–15	–
	blue grama	BOGR2	<i>Bouteloua gracilis</i>	0–15	–
	sand dropseed	SPCR	<i>Sporobolus cryptandrus</i>	0–15	–
	fringed signalgrass	URCI	<i>Urochloa ciliatissima</i>	0–15	–
Forb					
4				7–13	
	Palmer's spectaclepod	DICA31	<i>Dimorphocarpa candicans</i>	7–13	–
Shrub/Vine					
5				11–22	
	fourwing saltbush	ATCA2	<i>Atriplex canescens</i>	11–22	–
6				6–17	
	soaptree yucca	YUEL	<i>Yucca elata</i>	6–17	–
7				0–11	
	sand sagebrush	ARFI2	<i>Artemisia filifolia</i>	0–11	–
	jointfir	EPHED	<i>Ephedra</i>	0–11	–
8				0–6	
	littleleaf ratany	KRER	<i>Krameria erecta</i>	0–6	–

Animal community

Plants green up very early in the spring on this site with only scant rainfall. Due to this early green feed, cattle seek out this site and graze off the vegetation before it has time to make much growth. This site is susceptible to wind erosion where bare spots are found.

Natural water is seldom found on the site. Due to lack of water, larger mammals are only transients on the site. Fourwing saltbush is the principle shrub and provides good browse and seed production for wildlife.

Recreational uses

This site occurs as gentle rolling plains with occasional sand dunes interspersed. Plants bloom sooner with less moisture on this site, making this one of the first sites to show color in the spring. The generally mild climate allows for outdoor activities such as horseback riding, hunting, photography and nature studies year-round.

Contributors

Dan Robinett

Larry D. Ellicott
Steve Barker
Unknown

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)	Wilma Renken, Dan Robinett, Larry Humphrey, Gwen Dominguez
Contact for lead author	Tucson MLRA Soil Survey Office
Date	08/07/2013
Approved by	Curtis Talbot
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

Indicators

1. **Number and extent of rills:** None
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2. **Presence of water flow patterns:** Water flow paths occupy less than 10% of the surface area. Steeper sections have flow paths which are continuous. Smaller flow paths are discontinuous and 5-10 feet in length. Sandy soils preclude runoff in all but the most severe storms.
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3. **Number and height of erosional pedestals or terracettes:** Pedestals are common on all longer lived grasses and young atriplex (shrubs) and are from 1-3 inches in height. Pedestals on older atriplex shrubs are from 6-12 inches tall. All mesquite are quite old and have large mounds 2 to 3 feet tall with much rodent activity. Terracettes are uncommon on the site.
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4. **Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):** Bare soil is 70-75%, gravel ranges from 1-3% and basal cover of live perennial grasses is 1%. Bare areas are 10-20 feet in diameter and generally not connected.
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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:** Some evidence of wind scour around the bases of small shrubs (young atriplex and snakeweed). Erosion is evident on the windward side of smaller shrubs (SW) and

deposition on the lee side. Large shrubs of both mesquite and atriplex species have symmetrical mounds.

7. **Amount of litter movement (describe size and distance expected to travel):** Both fine and coarse litter size classes are moving short distances (2-6 feet) from wind in open spaces. Under large shrubs all litter classes are staying in place.
8. **Soil surface (top few mm) resistance to erosion (stability values are averages - most sites will show a range of values):** Values from soil slake test ratings were 1-2s (88%) and 3-5s (12%).
9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** A horizon is loamy sand 9 inches thick with no structure. Colors are 10 YR 6/4 dry and 10 YR 4/3 moist.
10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:** Sandy soil textures dominate the hydrology on the site. The plant community affords stability but adds little to hydrologic function. 61% of canopy gaps are > 6 ft and 10% < 6 ft. 96% of basal gaps are > 6 ft.
11. **Presence and thickness of compaction layer (usually none; describe soil profile features which may be mistaken for compaction on this site):** None present, average depth of penetration from an ARS field penetrometer with a 2.2 kg. sliding hammer is 17 cm.
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: large shrub (western honey mesquite, 94 plants/ac)

Sub-dominant: smaller shrubs (desert and fourwing saltbush, 345 plants/ac) > perennial grasses = subshrubs > succulents (soaptree yucca, 73 plants/ac) > annual forbs and grasses.

Other:

Additional:
13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):** Plant mortality strongly affected by weather patterns; 10-15% mortality on perennial grasses and sub-shrubs due to previous drought. No mortality on mesquite but some canopy die-back. Large shrubs of atriplex species appear decadent.
14. **Average percent litter cover (%) and depth (in):** Litter is absent from water flow patterns and bare areas.
15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):** 360 lbs/ac. in a below average year; 420 lbs/ac. in an average year; 480 lbs/ac. in an above average year.

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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: Tumbleweed
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17. **Perennial plant reproductive capability:** Not impaired.
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