

Ecological site R035XC346AZ **Shallow Sandy Loam 10-14" p.z.**

Accessed: 05/10/2025

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.

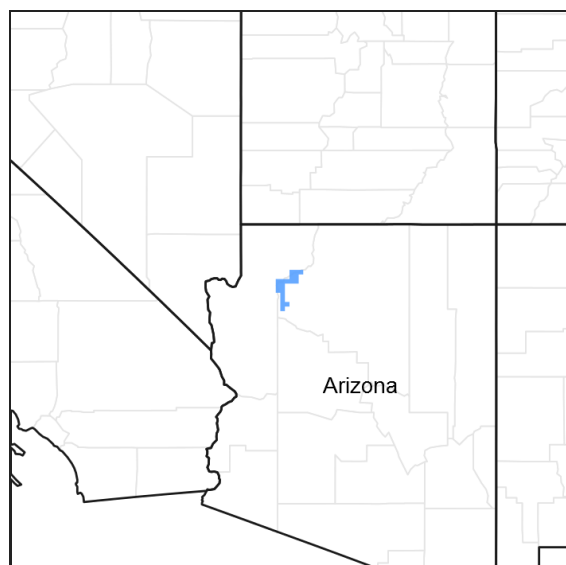


Figure 1. Mapped extent

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): 035X–Colorado Plateau

AZ CRA 35.3 – Colorado Plateau Sagebrush – Grasslands

Elevations range from 4500 to 6000 feet and precipitation averages 10 to 14 inches. Vegetation includes Wyoming big sagebrush, Utah juniper, Colorado pinyon - cliffrose, Mormon tea, fourwing saltbush, blackbrush Indian ricegrass, needle and thread, western wheatgrass Galleta, black grama, blue grama, and sand dropseed. The soil temperature regime is mesic and the soil moisture regime is ustic aridic. This unit occurs within the Colorado Plateau Physiographic Province and is characterized by a sequence of flat to gently dipping sedimentary rocks eroded into plateaus, valleys and deep canyons. Sedimentary rock classes dominate the plateau with volcanic fields occurring for the most part near its margin.

Table 1. Dominant plant species

Tree	(1) <i>Juniperus osteosperma</i> (2) <i>Pinus monophylla</i>
Shrub	(1) <i>Coleogyne ramosissima</i> (2) <i>Quercus turbinella</i>
Herbaceous	(1) <i>Bouteloua eriopoda</i>

Physiographic features

The dominant aspect of this site is a sparse stand of trees with shrubs and grasses. Site occurs on the "Esplanade" part of the Grand Canyon.

Table 2. Representative physiographic features

Landforms	(1) Mesa (2) Structural bench (3) Cuesta
Flooding duration	Extremely brief (0.1 to 4 hours) to very brief (4 to 48 hours)
Flooding frequency	None to rare
Ponding duration	Very brief (4 to 48 hours)
Ponding frequency	None to rare
Elevation	4,000–4,600 ft
Slope	2–15%
Aspect	Aspect is not a significant factor

Climatic features

Winter summer moisture ratios range from 70:30 to 60:40. Late spring is usually the driest period, and early fall moisture can be sporadic. Summer rains fall from June through September; moisture originates in the Gulf of Mexico and creates convective, usually brief, intense thunderstorms. Cool season moisture from October through May tends to be frontal; it originates in the Pacific and the Gulf of California and falls in widespread storms with longer duration and lower intensity. Precipitation generally comes as snow from December through February. Accumulations above 12 inches are not common but can occur. Snow usually lasts for 3-4 days, but can persist much longer. Summer daytime temperatures are commonly 95 - 100 F and on occasion exceed 105 F. Winter air temperatures can regularly go below 10 F and have been recorded below - 20 F.

Table 3. Representative climatic features

Frost-free period (average)	168 days
Freeze-free period (average)	193 days
Precipitation total (average)	14 in

Influencing water features

Soil features

Soils on this site consist of very shallow and shallow, well drained soils that formed in residuum, colluvium, and eolian material derived from sandstone and limestone. These soils are on cuestas, mesas, and structural benches. The soil moisture regime is Ustic Aridic and the temperature regime is Mesic.

Typical taxonomic units includes: SSA 699 Hualapai-Havasupai Area MU 38 Rizno.

Table 4. Representative soil features

Parent material	(1) Residuum–limestone and sandstone
Surface texture	(1) Fine sandy loam (2) Loamy fine sand
Family particle size	(1) Loamy
Drainage class	Well drained to somewhat excessively drained

Permeability class	Moderate to moderately rapid
Soil depth	10–20 in
Surface fragment cover <=3"	0–35%
Available water capacity (0–40in)	0–2.5 in
Calcium carbonate equivalent (0–40in)	5–15%
Electrical conductivity (0–40in)	0–2 mmhos/cm
Sodium adsorption ratio (0–40in)	0–5
Soil reaction (1:1 water) (0–40in)	7.3–8.4
Subsurface fragment volume <=3" (Depth not specified)	0–35%

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



State 1 Historic Climax Plant Community

Community 1.1 Historic Climax Plant Community

The dominant aspect of the site is a sparse stand of trees with shrubs and mid grasses. Utah juniper and singleleaf pinyon are the trees. Major shrubs are blackbrush, green mormontea and banana yucca. Dominant grasses include black grama, bottlebrush squirreltail and indian ricegrass.

Table 5. Annual production by plant type

Plant Type	Low (Lb/Acre)	Representative Value (Lb/Acre)	High (Lb/Acre)
Shrub/Vine	130	165	215
Grass/Grasslike	70	90	115
Tree	40	50	70
Forb	8	10	14
Total	248	315	414

Table 6. Ground cover

Tree foliar cover	0-10%
Shrub/vine/liana foliar cover	5-15%

Grass/grasslike foliar cover	2-10%
Forb foliar cover	0-1%
Non-vascular plants	0%
Biological crusts	0%
Litter	0%
Surface fragments >0.25" and <=3"	0%
Surface fragments >3"	0%
Bedrock	0%
Water	0%
Bare ground	0%

Table 7. Canopy structure (% cover)

Height Above Ground (Ft)	Tree	Shrub/Vine	Grass/ Grasslike	Forb
<0.5	—	—	—	0-1%
>0.5 <= 1	—	—	—	—
>1 <= 2	—	—	2-10%	—
>2 <= 4.5	—	5-15%	—	—
>4.5 <= 13	0-10%	—	—	—
>13 <= 40	—	—	—	—
>40 <= 80	—	—	—	—
>80 <= 120	—	—	—	—
>120	—	—	—	—

Figure 5. Plant community growth curve (percent production by month).
AZ3502, 35.1 10-14" p.z. black grama. Growth occurs mostly during the summer to early fall rainy season..

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	0	0	0	5	15	30	30	15	5	0	0

Figure 6. Plant community growth curve (percent production by month).
AZ3504, 35.3 10-14" p.z. bottlebrush squirreltail. Growth occurs in late winter, spring, and fall. Plants often remain green through the winter..

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	5	15	35	25	10	0	0	5	5	0	0

Figure 7. Plant community growth curve (percent production by month).
AZ3505, 35.3 10-14" p.z. Indian ricegrass. Growth begins in spring, with semi-dormancy occurring during July through August. Plants will green up again in the fall..

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	0	10	20	25	20	5	5	10	5	0	0

Figure 8. Plant community growth curve (percent production by month).
AZ3531, 35.3 10-14" p.z. all sites. Growth begins in the spring and continues through the summer..

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	1	3	17	18	10	19	20	10	1	1	0

Figure 9. Plant community growth curve (percent production by month).
 AZ5105, Blackbrush. Cool season grower, shuts down quickly when it gets hot..

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	5	20	50	20	5	0	0	0	0	0	0

Additional community tables

Table 8. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Lb/Acre)	Foliar Cover (%)
Tree					
0				35–70	
	Utah juniper	JUOS	<i>Juniperus osteosperma</i>	18–35	–
	singleleaf pinyon	PIMO	<i>Pinus monophylla</i>	18–35	–
Shrub/Vine					
0				160–175	
	blackbrush	CORA	<i>Coleogyne ramosissima</i>	53–88	–
	mormon tea	EPVI	<i>Ephedra viridis</i>	4–18	–
	broom snakeweed	GUSA2	<i>Gutierrezia sarothrae</i>	4–18	–
	Sonoran scrub oak	QUTU2	<i>Quercus turbinella</i>	4–18	–
	banana yucca	YUBA	<i>Yucca baccata</i>	4–18	–
	Shrub (>.5m)	2SHRUB	<i>Shrub (>.5m)</i>	4–18	–
	fourwing saltbush	ATCA2	<i>Atriplex canescens</i>	0–7	–
	alderleaf mountain mahogany	CEMO2	<i>Cercocarpus montanus</i>	0–7	–
Grass/Grasslike					
0				70–105	
	black grama	BOER4	<i>Bouteloua eriopoda</i>	18–35	–
	Grass, perennial	2GP	<i>Grass, perennial</i>	4–18	–
	Indian ricegrass	ACHY	<i>Achnatherum hymenoides</i>	4–18	–
	squirreltail	ELELE	<i>Elymus elymoides</i> ssp. <i>elymoides</i>	4–18	–
	needle and thread	HECOC8	<i>Hesperostipa comata</i> ssp. <i>comata</i>	0–11	–
	desert needlegrass	ACSP12	<i>Achnatherum speciosum</i>	0–11	–
	blue grama	BOGR2	<i>Bouteloua gracilis</i>	0–7	–
	James' galleta	PLJA	<i>Pleuraphis jamesii</i>	0–7	–
	big galleta	PLRI3	<i>Pleuraphis rigida</i>	0–7	–
	Fendler's threeawn	ARPUF	<i>Aristida purpurea</i> var. <i>fendleriana</i>	0–4	–
Forb					
0				4–18	
	Forb, perennial	2FP	<i>Forb, perennial</i>	4–11	–
	Forb, annual	2FA	<i>Forb, annual</i>	0–7	–

Animal community

Site is favorable for grazing throughout most of the year except when snow cover restricts availability of forage. With continuous grazing use during winter and spring, the relatively scarce cool season mid grasses are replaced by turbinella oak, snakeweed and lower value forbs and grasses. Prescribed grazing systems can benefit this site by allowing rest periods for the cool season species.

The potential plant community produced by this site provides food for those species of wildlife that utilize grass as a major portion of their diet. When vegetative retrogression occurs, unpalatable shrubby species increase and some wildlife species may be benefit.

Major wildlife species include: Mule deer, Desert bighorn sheep, Pronghorn antelope, coyote, cottontail rabbit, snakes and lizards.

Recreational uses

Site is located on gently sloping plains and mesa tops which lend themselves to activities such as horseback riding, wildlife observation and hunting.

Winters are cold, however, relatively mild spring, fall and summer months are attractive to recreationists.

Activities include photography, hiking, rock collecting, and wildlife observation.

Type locality

Location 1: Mohave County, AZ	
General legal description	Center and Northeast part of Vulcans Throne Quad; Hualapai Indian Reservation, Arizona.

Contributors

Karlynn Huling
Larry D. Ellicott

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:

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):**

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:

13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):**

14. **Average percent litter cover (%) and depth (in):**

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:**

17. **Perennial plant reproductive capability:**
