USDA Natural Resources Conservation Service

Ecological site R035XC304AZ
Loamy Upland 10-14" p.z. Cindery

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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.

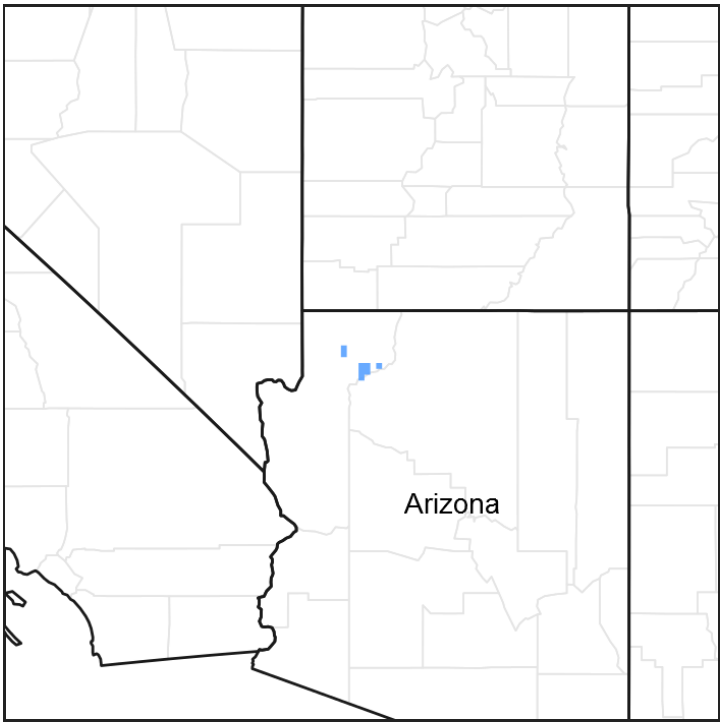

Figure 1. Mapped extent

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): 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.

Associated sites

R035XC301AZ	**Basalt Upland 10-14" p.z.** Basalt Upland, 10-14" p.z.

Table 1. Dominant plant species

Tree	Not specified
Shrub	(1) *Chrysothamnus viscidiflorus*
Herbaceous	(1) *Pleuraphis jamesii* (2) *Elymus elymoides ssp. elymoides*

Physiographic features

This site occurs on alluvial slopes and plains. It is recognizable by the covering of gravel sized cinders on the soil surface, often with calcium carbonate coatings and pendants. The soil of this site is deep to very deep and very cindery. Slopes generally range from 0 to 15 percent, but sometimes are as high as 30 percent.

Table 2. Representative physiographic features

Landforms	(1) Hill (2) Volcanic cone (3) Plain
Flooding frequency	None
Ponding frequency	None
Elevation	1,463–1,829 m
Slope	0–30%
Ponding depth	0 cm
Aspect	Aspect is not a significant factor

Climatic features

Winter-summer moisture ratios are typically 70:30 on the west side of this LRU and shift to 60:40 on the east. Late spring is usually the driest period, and early fall moisture can be sporadic. Summer rains fall June-September; moisture originates from the Gulf of Mexico and creates convective, usually brief, intense thunderstorms. Cool season moisture from October-May tends to be fronta;l originating in the Pacific and the Gulf of California and falling in widespread storms with longer duration and lower intensity. Precipitation generally comes as snow December-February. Accumulations above 12 inches are not common, but can occur. Snow usually lasts 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)	356 mm

Influencing water features

Soil features

The soils of this site are deep to very deep and very cindery. The water-plant relationship is poor, favoring plants that can withdraw moisture from the soil at high moisture tension. The surface texture is extremely gravelly loam. Subsurface horizon textures include very gravely loam , extremely gravely loam, extremely gravely sandy loam and loose cinders.

Typical taxonomic units mapped to this ESD include:

SSA 623 Shivwits Area MU 17 Chic;
SSA 701 Grand Canyon Area MU 153 Ustic Haplocambids.

Table 4. Representative soil features

Parent material	(1) Alluvium–scoria
Surface texture	(1) Extremely gravelly loam
Family particle size	(1) Loamy
Drainage class	Somewhat excessively drained
Permeability class	Moderate
Soil depth	152 cm
Surface fragment cover <=3"	0–60%

Surface fragment cover >3"	0–5%
Available water capacity (0-101.6cm)	3.71–7.37 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
Soil reaction (1:1 water) (0-101.6cm)	7.9–9
Subsurface fragment volume <=3" (Depth not specified)	0–35%
Subsurface fragment volume >3" (Depth not specified)	0–5%

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 aspect of this ecological site plant community is desert shrubs and perennial grasses. Douglas rabbitbrush is the dominant shrub species. Galleta, Indian ricegrass, blue grama and sand dropseed are the dominant perennial grasses. Douglas rabbitbrush is always a major component on the plant community on the site and as the amount of cinders in the soil increases, it becomes even more dominant. Typical plant spacing is 1.5-2 feet.

Table 5. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Shrub/Vine	185	–	235
Grass/Grasslike	84	–	135
Forb	3	–	17
Tree	–	–	3
Total	**272**	**–**	**390**

Table 6. Ground cover

Tree foliar cover	0-1%
Shrub/vine/liana foliar cover	1-2%
Grass/grasslike foliar cover	0-1%
Forb foliar cover	0-1%
Non-vascular plants	0%
Biological crusts	0-1%
Litter	15-25%
Surface fragments >0.25" and <=3"	1-5%
Surface fragments >3"	0%
Bedrock	0%
Water	0%
Bare ground	70-80%

Table 7. Canopy structure (% cover)

Height Above Ground (M)	Tree	Shrub/Vine	Grass/ Grasslike	Forb
<0.15	–	–	–	0-1%
>0.15 <= 0.3	–	–	0-1%	–
>0.3 <= 0.6	–	5-10%	–	–
>0.6 <= 1.4	–	–	–	–
>1.4 <= 4	0-1%	–	–	–
>4 <= 12	–	–	–	–
>12 <= 24	–	–	–	–
>24 <= 37	–	–	–	–
>37	–	–	–	–

Figure 5. 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

Additional community tables

Table 8. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Kg/Hectare)	Foliar Cover (%)
Grass/Grasslike					
1	**Dominant Native Perennial Summer Grasses**			34–50	
	James' galleta	PLJA	*Pleuraphis jamesii*	34–50	–
2				4–10	
	squirreltail	ELELE	*Elymus elymoides ssp. elymoides*	7–17	–
	needle and thread	HECOC8	*Hesperostipa comata ssp. comata*	4–10	–
	Indian ricegrass	ACHY	*Achnatherum hymenoides*	4–10	–
	threeawn	ARIST	*Aristida*	1–3	–
3	**Occasional Native Perennial Summer Grasses**			17–40	
	sand dropseed	SPCR	*Sporobolus cryptandrus*	7–17	–
	black grama	BOER4	*Bouteloua eriopoda*	4–10	–
	blue grama	BOGR2	*Bouteloua gracilis*	4–10	–
	burrograss	SCBR2	*Scleropogon brevifolius*	1–3	–
Forb					
4	**Occasional Native Perennial Forbs**			3–7	
	Forb, perennial	2FP	*Forb, perennial*	3–7	–
	Forb, perennial	2FP	*Forb, perennial*	3–7	–
5	**Occasional Native Annual Forbs**			3–17	
	Forb, annual	2FA	*Forb, annual*	3–10	–
	Forb, annual	2FA	*Forb, annual*	3–10	–
Shrub/Vine					

Shrub/Vine					
6	**Dominant Native Shrubs**			185–219	
	yellow rabbitbrush	CHVI8	*Chrysothamnus viscidiflorus*	185–219	–
	yellow rabbitbrush	CHVI8	*Chrysothamnus viscidiflorus*	185–219	–
7	**Occasional Native Shrubs**			24–50	
	broom snakeweed	GUSA2	*Gutierrezia sarothrae*	3–7	–
	broom snakeweed	GUSA2	*Gutierrezia sarothrae*	3–7	–
	winterfat	KRLA2	*Krascheninnikovia lanata*	1–3	–
	fourwing saltbush	ATCA2	*Atriplex canescens*	1–3	–
	winterfat	KRLA2	*Krascheninnikovia lanata*	1–3	–
	fourwing saltbush	ATCA2	*Atriplex canescens*	1–3	–
	Nevada jointfir	EPNE	*Ephedra nevadensis*	0–1	–
	mormon tea	EPVI	*Ephedra viridis*	0–1	–
	pale desert-thorn	LYPA	*Lycium pallidum*	0–1	–
	Nevada jointfir	EPNE	*Ephedra nevadensis*	0–1	–
	mormon tea	EPVI	*Ephedra viridis*	0–1	–
	pale desert-thorn	LYPA	*Lycium pallidum*	0–1	–
8	**Occasional Native Agave-Yucca-Likes**			0–3	
	banana yucca	YUBA	*Yucca baccata*	0–3	–
	banana yucca	YUBA	*Yucca baccata*	0–3	–
9	**Occasional Native Cacti**			0–3	
	pricklypear	OPUNT	*Opuntia*	0–3	–
	pricklypear	OPUNT	*Opuntia*	0–1	–
Tree					
10	**Occasional Native Trees**			0–3	
	Utah juniper	JUOS	*Juniperus osteosperma*	0–3	–
	Utah juniper	JUOS	*Juniperus osteosperma*	0–3	–

Animal community

Complex slopes and vertical exposures of rock limit access to livestock in some areas and encourage overgrazing of less sloping areas. Low vegetative production limits management alternatives.

This site is of limited value to wildlife, especially large mammals due to the low production and lack of forbs and palatable shrubs. Burrowing animals find the doil fairly easy to dig. Management should be directed towards prescribed grazing use.

Wildlife found on the site include horned lark, Gambel's quail, roadrunner, mourning dove, red-tailed hawk, prairie falcon, peregrine falcon, golden eagle, kangaroo rat, white-crowned sparrow, woodrat, rock squirrel, kit fox, badger, gray fox, mule deer, cougar, coyote, chuckwalla, leopard lizard, coachwhip, northern whiptail lizard, and sidewinder. This is a short list of the more common species found. Many other species are present as well, and migratory birds are common at times.

Hydrological functions

High intake soil limits runoff.

Wood products

No wood products are produced on this site.

Type locality

Location 1: Mohave County, AZ	
Township/Range/Section	T37 N. R6 W. S36
General legal description	Arizona, Mohave Co., Heaton Knolls 7 1/2 min. quad., NE 1/4, NE 1/4, Sec. 36, T. 37 N., R. 6 W.

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)	
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:

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17. **Perennial plant reproductive capability:**
