

Ecological site R035XC303AZ  
Cinder Hills 10-14" p.z.

Accessed: 05/11/2025

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.

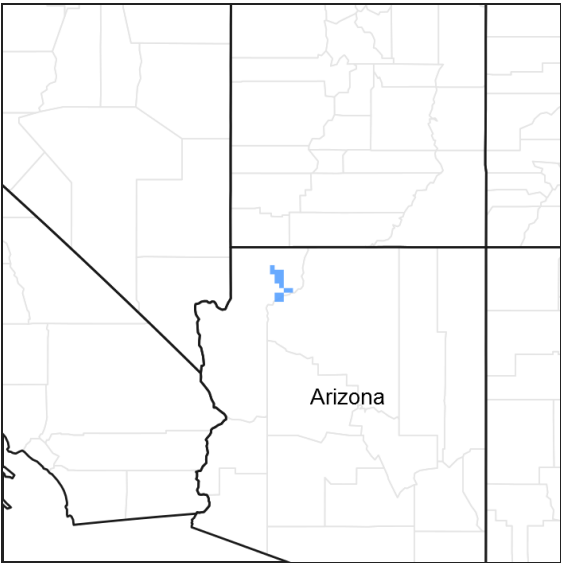


Figure 1. Mapped extent

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	Not specified
Shrub	(1) <i>Artemisia tridentata ssp. wyomingensis</i> (2) <i>Ephedra</i>
Herbaceous	(1) <i>Bouteloua gracilis</i> (2) <i>Poa fendleriana</i>

## Physiographic features

This site occurs on the sides of cinder cones. Excessive runoff occurs.

**Table 2. Representative physiographic features**

Landforms	(1) Cinder cone
Flooding frequency	None
Ponding frequency	None
Elevation	5,500–5,800 ft
Slope	10–14%
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 grouped into this range site are deep to any plant root restricting layer. Surface and subsurface textures are extremely gravelly loam over cinder. Cinder content ranges from 60-100%. Soil reaction is slightly or moderately alkaline (7.4-8.4 pH).

Typical taxonomic units mapped with this ESD include:

SSA 625 Mohave County Area NE part MU67 Lomaki & Wukoki;

SSA 699 Hualapai-Havasupai Area MU 58 Wukoki;

SSA 701 Grand Canyon Area MU 61 Vitrandic Haplocalcids & Vitrandic Haplocambids;

SSA-713 Chinle Area MU 2000 Campanile;

SSA-715 Fort Defiance Area AZ-NM MU 2 Hawaikuh.

**Table 4. Representative soil features**

Parent material	(1) Alluvium–basalt (2) Colluvium–pyroclastic rock (3) Residuum–limestone and sandstone
Surface texture	(1) Very gravelly loam (2) Extremely gravelly

Family particle size	(1) Loamy
Drainage class	Somewhat excessively drained
Permeability class	Moderate to moderately rapid
Soil depth	60 in
Surface fragment cover <=3"	80%
Available water capacity (0-40in)	1.9–3.9 in
Calcium carbonate equivalent (0-40in)	0–5%
Electrical conductivity (0-40in)	0–2 mmhos/cm
Sodium adsorption ratio (0-40in)	0
Soil reaction (1:1 water) (0-40in)	7.4–8.4
Subsurface fragment volume <=3" (Depth not specified)	0%
Subsurface fragment volume >3" (Depth not specified)	90–95%

## 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 plant community is made up primarily of mid and short grasses with a relatively small percentage of trees, shrubs and half shrubs. The original plant community included a mixture of both warm and cool season grasses. Plant species most likely to invade or increase as this site deteriorates are snakeweed, annuals, cacti, juniper and pinyon. Continuous grazing during the winter and spring periods will decrease cool season grasses which are replaced by warm season, lower forage value grasses and shrubs.

Table 5. Annual production by plant type

Plant Type	Low (Lb/Acre)	Representative Value (Lb/Acre)	High (Lb/Acre)
Grass/Grasslike	450	525	600
Shrub/Vine	75	112	150
Forb	8	22	38
<b>Total</b>	<b>533</b>	<b>659</b>	<b>788</b>

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 6. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Lb/Acre)	Foliar Cover (%)
<b>Grass/Grasslike</b>					
1				22–38	
	squirreltail	ELELE	<i>Elymus elymoides ssp. elymoides</i>	22–38	–
2				75–112	
	needle and thread	HECOC8	<i>Hesperostipa comata ssp. comata</i>	75–112	–
3				112–150	
	muttongrass	POFE	<i>Poa fendleriana</i>	112–150	–
4				75–112	
	sideoats grama	BOCU	<i>Bouteloua curtipendula</i>	75–112	–
5				75–112	
	black grama	BOER4	<i>Bouteloua eriopoda</i>	75–112	–
6				112–188	
	blue grama	BOGR2	<i>Bouteloua gracilis</i>	112–188	–
7				38–75	
	James' galleta	PLJA	<i>Pleuraphis jamesii</i>	38–75	–
8				22–38	
	sand dropseed	SPCR	<i>Sporobolus cryptandrus</i>	22–38	–
9				7–22	
	threeawn	ARIST	<i>Aristida</i>	7–22	–
<b>Forb</b>					
10				7–38	
	Forb, annual	2FA	<i>Forb, annual</i>	7–38	–
	Forb, perennial	2FP	<i>Forb, perennial</i>	7–38	–
<b>Shrub/Vine</b>					
11				7–38	
	fourwing saltbush	ATCA2	<i>Atriplex canescens</i>	7–38	–
12				7–38	
	winterfat	KRLA2	<i>Krascheninnikovia lanata</i>	7–38	–
13				7–38	
	jointfir	EPHED	<i>Ephedra</i>	75–38	–
14				7–38	
	prairie sagewort	ARFR4	<i>Artemisia frigida</i>	7–38	–
	rabbitbrush	CHRY9	<i>Chrysothamnus</i>	7–38	–
	woolly groundsel	PACA15	<i>Packera cana</i>	7–38	–
15				38–75	
	big sagebrush	ARTR2	<i>Artemisia tridentata</i>	38–75	–
16				8–22	
	pricklypear	OPUNT	<i>Opuntia</i>	8–22	–
<b>Tree</b>					
17				38–75	
	Utah juniper	JUOS	<i>Juniperus osteosperma</i>	38–75	–
	twoneedle pinyon	PIED	<i>Pinus edulis</i>	38–75	–

## Animal community

This site is suitable for grazing at any time of the year by any class of livestock. Snow cover can hide forage plants for short periods during the winter. Mechanical improvement practices such as chaining, pitting, or seeding would not be adaptable on this site because of steep slopes. The site will respond relatively fast to good grazing management.

## Recreational uses

This site includes steep cinder cones and toe slopes of the cones. The cinder cones are quite scenic due to the abruptness of the slopes to adjacent sites. Winters are cool and damp; summers are warm to very warm. Spring and fall are the driest seasons and are normally windy. Activities include photography, hunting, wildlife observation and rock collecting.

## Other information

T&E Species: Golden Eagle and Prairie Falcon.

## 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:**

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2. **Presence of water flow patterns:**

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3. **Number and height of erosional pedestals or terracettes:**

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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:**

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6. **Extent of wind scoured, blowouts and/or depositional areas:**

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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):**

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9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):**

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10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:**

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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):**

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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:**
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