

## Ecological site R035XC347AZ Basalt Hills 10-14" p.z. Cobbly

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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.

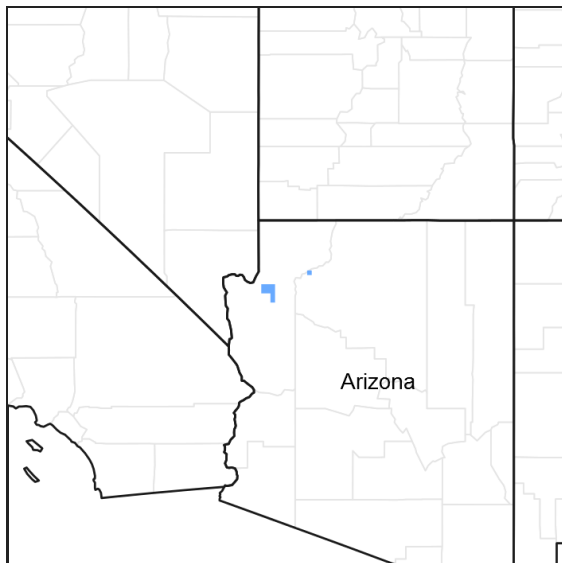


Figure 1. Mapped extent

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.

Table 1. Dominant plant species

Tree	(1) <i>Juniperus osteosperma</i>
Shrub	(1) <i>Coleogyne ramosissima</i>
Herbaceous	(1) <i>Bouteloua curtipendula</i> (2) <i>Elymus elymoides</i> ssp. <i>elymoides</i>

## Physiographic features

These sites are on basalt flows and mesas.

**Table 2. Representative physiographic features**

Landforms	(1) Mesa
Flooding duration	Extremely brief (0.1 to 4 hours) to very brief (4 to 48 hours)
Flooding frequency	None to rare
Ponding frequency	None
Elevation	1,463–1,768 m
Slope	2–35%
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)	356 mm

## Influencing water features

### Soil features

The soils on this site consist of shallow, well drained, slowly permeable soils that formed in eolian material and alluvium weathered from basalt.

Typical taxonomic unit includes:

SSA 697 Mohave County Central Part MU 114 prieta;  
SSA 699 Hualapai-Havasupai Area MU 36 prieta.

**Table 4. Representative soil features**

Parent material	(1) Eolian deposits–basalt
Surface texture	(1) Extremely cobbly loam (2) Very cobbly loam
Family particle size	(1) Loamy
Drainage class	Moderately well drained to well drained
Permeability class	Moderately slow to slow
Soil depth	13–51 cm

Surface fragment cover >3"	20–40%
Available water capacity (0-101.6cm)	0–6.35 cm
Electrical conductivity (0-101.6cm)	0–2 mmhos/cm
Sodium adsorption ratio (0-101.6cm)	0–5
Soil reaction (1:1 water) (0-101.6cm)	6.8–7.6
Subsurface fragment volume <=3" (Depth not specified)	0–10%
Subsurface fragment volume >3" (Depth not specified)	20–40%

## 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**

This site consists of a plant community of grasses with a significant percentage of shrubs. In the potential plant community, there is a mixture of cool and warm season grasses. Plant species most likely to increase or invade on this site when it deteriorates are fender threeawn, broom snakeweed, Buckhorn cholla, and annual grasses and forbs. Continuous livestock grazing during the spring will decrease cool season grasses, which are replaced by lower forage grasses and shrubs. Because of the scattered canopy cover and sparse understory, this site does not have a history of regular fire disturbance. Blackbrush plant communities are often quite old and tend to be stable. If it is severely disturbed this site will revert to an early seral stage of mostly annuals, including a large increase of cheatgrass brome and broom snakeweed. A more advanced plant community will contain scattered desert shrubs and a small increase in perennial grasses, with little regeneration of blackbrush. It is speculated that blackbrush communities evolved under a different climatic regime, and once removed will not readily return to a site.

Table 5. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Shrub/Vine	231	278	340
Grass/Grasslike	178	214	262
Forb	12	16	19
Tree	12	16	19
<b>Total</b>	<b>433</b>	<b>524</b>	<b>640</b>

Table 6. Ground cover

Tree foliar cover	0-5%
Shrub/vine/liana foliar cover	10-25%
Grass/grasslike foliar cover	0-10%
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 (M)	Tree	Shrub/Vine	Grass/ Grasslike	Forb
<0.15	–	0-5%	1-2%	0-1%
>0.15 <= 0.3	–	1-2%	–	–
>0.3 <= 0.6	–	1-10%	0-5%	–
>0.6 <= 1.4	–	5-25%	–	–
>1.4 <= 4	0-5%	–	–	–
>4 <= 12	–	–	–	–
>12 <= 24	–	–	–	–
>24 <= 37	–	–	–	–
>37	–	–	–	–

Figure 5. 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 6. Plant community growth curve (percent production by month). AZ3514, 35.3 10-14" p.z. muttongrass. Growth begins in spring and continues with the summer rains..

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	0	5	15	20	20	20	10	10	0	0	0

Figure 7. 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 8. Plant community growth curve (percent production by month). AZ5103, 35.1 10-14" p.z. sideoats grama. Most growth occurs in summer and early fall during the rainy season..

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	0	0	5	10	20	30	20	10	5	0	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 (Kg/Hectare)	Foliar Cover (%)
<b>Tree</b>					
0	<b>Orig Range Site</b>			6–26	
	Utah juniper	JUOS	<i>Juniperus osteosperma</i>	6–26	–
	singleleaf pinyon	PIMO	<i>Pinus monophylla</i>	0–16	–
<b>Shrub/Vine</b>					
0	<b>Orig Range Site</b>			252–303	
	blackbrush	CORA	<i>Coleogyne ramosissima</i>	202–228	–
	Shrub (>.5m)	2SHRUB	<i>Shrub (&gt;.5m)</i>	6–26	–
	Stansbury cliffrose	PUST	<i>Purshia stansburiana</i>	6–26	–
	Utah agave	AGUT	<i>Agave utahensis</i>	0–16	–
	mormon tea	EPVI	<i>Ephedra viridis</i>	6–16	–
	bastardsage	ERWR	<i>Eriogonum wrightii</i>	0–10	–
	fourwing saltbush	ATCA2	<i>Atriplex canescens</i>	0–10	–
	banana yucca	YUBA	<i>Yucca baccata</i>	0–10	–
	beavertail pricklypear	OPBA2	<i>Opuntia basilaris</i>	0–6	–
<b>Grass/Grasslike</b>					
0	<b>Orig Range Site</b>			202–228	
	sideoats grama	BOCU	<i>Bouteloua curtipendula</i>	50–76	–
	squirreltail	ELELE	<i>Elymus elymoides ssp. elymoides</i>	26–50	–
	muttongrass	POFE	<i>Poa fendleriana</i>	26–50	–
	Grass, perennial	2GP	<i>Grass, perennial</i>	6–26	–
	Indian ricegrass	ACHY	<i>Achnatherum hymenoides</i>	0–26	–
	desert needlegrass	ACSP12	<i>Achnatherum speciosum</i>	0–16	–
	Fendler's threeawn	ARPUF	<i>Aristida purpurea var. fendleriana</i>	0–10	–
	black grama	BOER4	<i>Bouteloua eriopoda</i>	0–10	–
	blue grama	BOGR2	<i>Bouteloua gracilis</i>	0–10	–
	needle and thread	HECOC8	<i>Hesperostipa comata ssp. comata</i>	0–10	–
	big galleta	PLRI3	<i>Pleuraphis rigida</i>	0–10	–
	slim tridens	TRMU	<i>Tridens muticus</i>	0–6	–
<b>Forb</b>					
0	<b>Orig Range Site</b>			6–26	
	Forb, perennial	2FP	<i>Forb, perennial</i>	6–16	–
	Forb, annual	2FA	<i>Forb, annual</i>	6–10	–
	desert globemallow	SPAM2	<i>Sphaeralcea ambigua</i>	0–6	–

## Animal community

This site is suitable for grazing during any period of the year by cows and calves, stocker cattle, sheep and horses. Prescribed grazing systems can benefit this site by allowing rest periods for the cool season species.

The potential plant community provides a variety of food and cover plants for wildlife. There is relatively poor diversity within the plant community of this site. Because of the shrub component, the site is dominated by shrubland wildlife species. However, the site is transitory to almost all species because of the lack of water. Grazing practices that encourage cool season grass species are beneficial to antelope, cottontails and rodents. Shrubs that provide both food and cover should be maintained.

## Recreational uses

Site is located on gently sloping plains and mesa tops which lend themselves to activities such as horseback riding, photography, and wildlife observation. This site has a variety of spring and summer flowers.

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

## Type locality

Location 1: Mohave County, AZ	
Township/Range/Section	T29N R15W S21
General legal description	Grapevine Canyon Quad; Southeast corner of Quad along Buck and Doe Road; Section 21, T29N, R15W; Hualapai Indian Reservation.

## 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):**

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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):**

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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):**

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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:**

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