USDA Natural Resources
Conservation Service

Ecological site R035XG701AZ
Basalt Upland 14-18" 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.

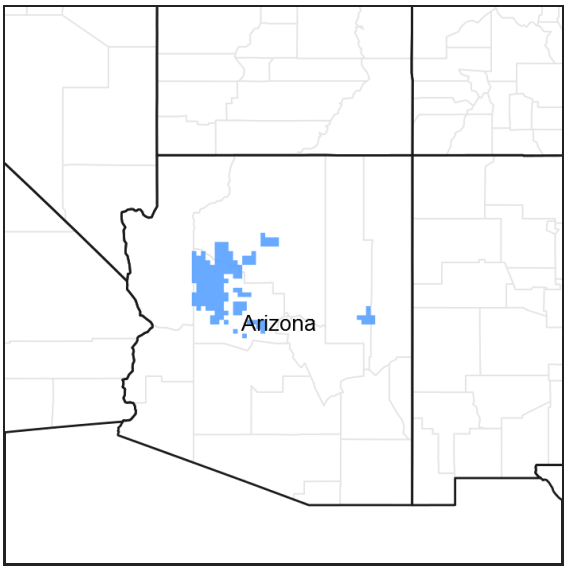

Figure 1. Mapped extent

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): 035X–Colorado Plateau

AZ CRA 35.7 – Colorado Plateau Woodland – Grassland

Elevations range from 5000 to 7000 feet and precipitation averages 14 to 18 inches per year. Vegetation includes one-seed juniper, Colorado pinyon, Stansbury cliffrose, Apache plume, four-wing saltbush, green Mormon tea, needle and thread, sideoats grama, blue grama, black grama, galleta, bottlebrush squirreltail, and muttongrass. The soil temperature regime is mesic and the soil moisture regime is aridic ustic. 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) *Juniperus osteosperma* (2) *Pinus edulis*
Shrub	(1) *Purshia mexicana* (2) *Purshia tridentata*

Herbaceous	(1) *Poa fendleriana* (2) *Koeleria macrantha*

Physiographic features

This upland site occurs on hillsides, terraces, mesas, and plateaus on old basalt flows. The soil is shallow to a plant root restricting layer. The soil surface texture ranges from cobbly clay to stony clay and is non-effervescent. The soil surface is often covered with stones and cobbles. The slope of the site is generally 1 to 15 percent, but occasionally may reach 30 percent. The site does not benefit from any run-in moisture, but on steeper slopes, excessive runoff occurs.

Table 2. Representative physiographic features

Landforms	(1) Terrace (2) Plateau
Flooding frequency	None
Ponding frequency	None
Elevation	1,676–2,103 m
Slope	1–15%
Aspect	Aspect is not a significant factor

Climatic features

The climate of the land resource unit is semiarid with warm summers and cool winters. The mean annual precipitation ranges from 14 to 18 inches, but is very erratic, often varying substantially from year to year. The majority of the precipitation is received from October through April. This precipitation comes as gentle rain or snow from frontal storms coming out of the Pacific Ocean. Snow is common from November through February. Generally no more than a few inches of snow accumulates, melting within a few days, but may last a week or more. The remaining precipitation, approximately 40 percent, is received from July through September as spotty, unreliable and sometimes violent thunderstorms. The moisture for this precipitation originates in the Gulf of Mexico (and the Pacific Ocean in the fall) and flows into the area on the north end of the Mexican monsoon. Late May through late June is generally a dry period. The mean annual temperature ranges from 46 to 52 degrees Fahrenheit (F). The frost-free period (air temperature > 32 degrees F) ranges from 108 to 151 days (@ 50 percent probability). Strong winds are common, especially in the spring.

Table 3. Representative climatic features

Frost-free period (average)	151 days
Freeze-free period (average)	170 days
Precipitation total (average)	457 mm

Influencing water features

Soil features

The soil of this ecological site is generally shallow (ocassionaly moderately deep) to any plant root restricting layer. Surface texture ranges from cobbly clay loam to stony clay. The soil surface is generally non-effervescent. The subsurface textures are typically clay or silty clay loam. Cracking is noticeable on the soil surface due to the shrink-swell nature of the clay contained in the soil profile. Rock fragments range from 10-30% throughout the profile. Soils are slightly acidic to neutral (pH 6.1-7.3).

Typical taxonomic units include:

SSA-631 Coconino Central MU's 47 Cabezon, 6 Seligman, 6 Boquuillas, 71 Cross;

SSA-636 MU's all Cabezon CaD, CbC, CdC, CeE;
SSA-633 Navajo County Area MU's - 14 Deama.

Table 4. Representative soil features

Surface texture	(1) Cobbly clay loam (2) Stony clay (3) Stony clay loam
Family particle size	(1) Clayey
Drainage class	Well drained
Permeability class	Slow to very slow
Soil depth	38–97 cm
Surface fragment cover >3"	80–90%
Available water capacity (0-101.6cm)	6.91–8.41 cm
Calcium carbonate equivalent (0-101.6cm)	0–60%
Electrical conductivity (0-101.6cm)	0–2 mmhos/cm
Sodium adsorption ratio (0-101.6cm)	0
Soil reaction (1:1 water) (0-101.6cm)	6.6–8.4
Subsurface fragment volume <=3" (Depth not specified)	20–30%
Subsurface fragment volume >3" (Depth not specified)	5–30%

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 ben 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

This site has a mixed plant community made up of juniper and pinyon pine (10-24% overstory ground cover), and an understory of mid and short grasses, forbs and shrubs. In the original plant community, there is a mixture of cool and warm season grasses. Plant species most likely to increase or invade are blue yucca, broom snakeweed, annual forbs, prickly pear, hedgehog and blue gramma. Continuous grazing during the winter and spring will decrease cool season grasses which are replaced by lower forage value grasses and forbs.

Table 5. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Grass/Grasslike	177	–	256
Shrub/Vine	59	–	99
Forb	20	–	39
Tree	4	–	20
Total	**260**	**–**	**414**

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				4–20	
	prairie Junegrass	KOMA	*Koeleria macrantha*	4–20	–
2				20–58	
	muttongrass	POFE	*Poa fendleriana*	20–58	–
3				4–20	
	squirreltail	ELELE	*Elymus elymoides ssp. elymoides*	4–20	–
4				0–20	
	western wheatgrass	PASM	*Pascopyrum smithii*	0–20	–
5				0–4	
	Arizona threeawn	ARAR6	*Aristida arizonica*	0–4	–
6				0–4	
	sixweeks fescue	VUOC	*Vulpia octoflora*	0–4	–
7				58–78	
	sideoats grama	BOCU	*Bouteloua curtipendula*	58–78	–
8				4–11	
	Fendler's threeawn	ARPUF	*Aristida purpurea var. fendleriana*	4–11	–
9				4–20	
	black grama	BOER4	*Bouteloua eriopoda*	4–20	–
10				4–20	
	needle and thread	HECOC8	*Hesperostipa comata ssp. comata*	4–20	–
11				20–58	
	blue grama	BOGR2	*Bouteloua gracilis*	20–58	–
	hairy grama	BOHI2	*Bouteloua hirsuta*	20–58	–
12				20–39	
	common wolfstail	LYPH	*Lycurus phleoides*	20–39	–
	spike muhly	MUWR	*Muhlenbergia wrightii*	20–39	–
	James' galleta	PLJA	*Pleuraphis jamesii*	20–39	–
Forb					
13				20–39	
	Eastwood's sandwort	AREA	*Arenaria eastwoodiae*	20–39	–
	mariposa lily	CALOC	*Calochortus*	20–39	–
	lambsquarters	CHAL7	*Chenopodium album*	20–39	–
	rose heath	CHER2	*Chaetopappa ericoides*	20–39	–
	thistle	CIRSI	*Cirsium*	20–39	–
	fleabane	ERIGE2	*Erigeron*	20–39	–
	buckwheat	ERIOG	*Eriogonum*	20–39	–
	sulphur-flower buckwheat	ERUM	*Eriogonum umbellatum*	20–39	–
	spurge	EUPHO	*Euphorbia*	20–39	

	spurge	EUPHO	*Euphorbia*	20–39	–
	fineleaf hymenopappus	HYFI	*Hymenopappus filifolius*	20–39	–
	trefoil	LOTUS	*Lotus*	20–39	–
	lupine	LUPIN	*Lupinus*	20–39	–
	Colorado four o'clock	MIMU	*Mirabilis multiflora*	20–39	–
	James' beardtongue	PEJA	*Penstemon jamesii*	20–39	–
	slimflower scurfpea	PSTE5	*Psoralidium tenuiflorum*	20–39	–
	hedgemustard	SISYM	*Sisymbrium*	20–39	–
	globemallow	SPHAE	*Sphaeralcea*	20–39	–
	branched noseburn	TRRA5	*Tragia ramosa*	20–39	–
	vervain	VERBE	*Verbena*	20–39	–
Shrub/Vine					
14				20–39	
	Stansbury cliffrose	PUST	*Purshia stansburiana*	20–39	–
	antelope bitterbrush	PUTR2	*Purshia tridentata*	20–39	–
15				4–8	
	skunkbush sumac	RHTR	*Rhus trilobata*	4–8	–
16				4–20	
	goldenbush	ERICA2	*Ericameria*	4–20	–
	broom snakeweed	GUSA2	*Gutierrezia sarothrae*	4–20	–
17				1–2	
	Fremont's mahonia	MAFR3	*Mahonia fremontii*	4–11	–
	currant	RIBES	*Ribes*	4–11	–
18				20–39	
	banana yucca	YUBA	*Yucca baccata*	20–39	–
19				20–39	
	sacahuista	NOMI	*Nolina microcarpa*	20–39	–
20				11–20	
	pricklypear	OPUNT	*Opuntia*	11–20	–
21				11–20	
	kingcup cactus	ECTR	*Echinocereus triglochidiatus*	11–20	–
22				11–20	
Tree					
23				45–20	
	alligator juniper	JUDE2	*Juniperus deppeana*	4–20	–
	Utah juniper	JUOS	*Juniperus osteosperma*	4–20	–
	twoneedle pinyon	PIED	*Pinus edulis*	45–20	–

Animal community

This site is suitable for grazing by all classes of livestock during most periods except when snow cover restricts availability of forage. Planned grazing systems adapt well on this site. The site will repsond to management rather slowly, particularly on spots that have not historically been concentration areas. Range seeding can be used to maintain and improve productivity on this site.

Some of the major primary consumers that aided in the development of this site are antelope, mule deer, elk,

jackrabbit and cottontail. Secondary customers that inhibat the site are couote, bobcat, golden eagles and redtail hawks.

The diversity of grasses, forbs, shrubs and trees promotes a relatively high diversity of wildlife when the site is in excellent condition. Water is generally lacking on the site, but abundant food and stratified cove contribute to its importance. Relatively small open areas created by tree removal may contrigute to further diversified use by wildlife species.

Recreational uses

The site occurs as terraces or plateaus on old basalt flows. It has high aesthetic appeal, particularly where it borgers open grasslands for contrast. Weather is characteristically warm in summer and cold in winter. High velocity winds in spring and summer are common. Primary recreational activities include hunting, hiking and wilelife.

Wood products

This site is an excellent site for the production of firewood. Undistrubed sights may contain fuelfood exceeding 30 cords pr acre. Sustained production of fuelwood can be managed at a 6-yr rotation.

Post production, particularly large-diamerer (12-16"), in an undisturbed site ranges from 19-40 seven-foot posts per acre.

Other information

T&E Species: golden eagles use the site for feeding.

Type locality

Location 1: Cochise County, AZ	
Township/Range/Section	T26 N. R4 W. S26
General legal description	1/4 mile east of Pineveta Wash, Sec. 26, T 23 N., R 4 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:**

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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:

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:**