USDA Natural Resources
Conservation Service

Ecological site R035XC301AZ
Basalt Upland 10-14" 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.

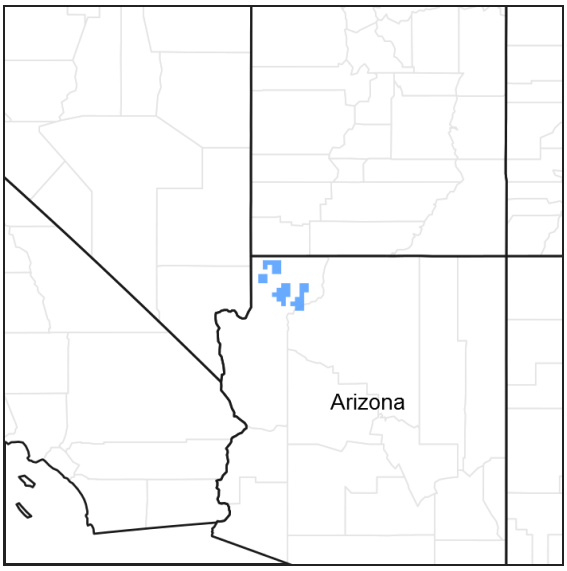

Figure 1. Mapped extent

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 35.3 – 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) *Artemisia tridentata ssp. wyomingensis* (2) *Atriplex canescens*
Herbaceous	(1) *Poa fendleriana* (2) *Bouteloua gracilis*

Physiographic features

This site occurs in an upland position and does not benefit from any run-in moisture. Excessive runoff occurs on steeper slopes.

Table 2. Representative physiographic features

Landforms	(1) Hill
Flooding frequency	None
Ponding frequency	None
Elevation	4,800–5,800 ft
Slope	0–40%
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 are very shallow to shallow to either basalt bedrock or a hardpan creating a plant restricting layer. Surface texture range from a fine sandy loam to loam and are covered with gravels and cobbles. Subsurface textures range from loam to silty clay. Coarse fragments range from 20-75% throughout the profile. Soils are slightly to moderately alkaline (pH 7.4-8.4). Erosion hazard is very slight to moderate depending on plant and rock cover and slope.

Typical Taxonomic Units include:

SSA 623 Sjovwots Area Mu's 17 Teesto and 61 Pocum;
SSA 625 Mohave County Area NE part MU 11 Curhollow & Prieta;
SSA 701 Grand Canyon Area MU's 20 Childers, 49 Ustic haplargids.

Table 4. Representative soil features

Parent material	(1) Colluvium–basalt
Surface texture	(1) Very cobbly clay loam (2) Gravelly fine sandy loam (3) Loam
Family particle size	(1) Loamy

Drainage class	Well drained
Permeability class	Moderate to very slow
Soil depth	10–18 in
Surface fragment cover <=3"	20–25%
Surface fragment cover >3"	5–10%
Available water capacity (0-40in)	0.7–2.3 in
Calcium carbonate equivalent (0-40in)	0–20%
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)	30–50%
Subsurface fragment volume >3" (Depth not specified)	20–45%

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 range site is made up primarily of mid and short grasses with a large amount of shrubs and trees. There is a mixture of both cool and warm season grasses in the original plant community. Plant species most likely to invade or increase on this range site are big sagebrush, snakeweed, juniper, rabbitbrush and annuals.

Table 5. Annual production by plant type

Plant Type	Low (Lb/Acre)	Representative Value (Lb/Acre)	High (Lb/Acre)
Grass/Grasslike	292	–	390
Shrub/Vine	163	–	228
Forb	32	–	65
Total	**487**	**–**	**683**

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 (%)
Grass/Grasslike					
1				0–65	
	western wheatgrass	PASM	*Pascopyrum smithii*	0–65	–
2				32–98	
	Indian ricegrass	ACHY	*Achnatherum hymenoides*	32–98	–
3				65–162	
	muttongrass	POFE	*Poa fendleriana*	65–162	–
4				32–65	
	squirreltail	ELELE	*Elymus elymoides ssp. elymoides*	32–65	–
5				32–98	
	needle and thread	HECOC8	*Hesperostipa comata ssp. comata*	32–98	–
6				35–70	
	sideoats grama	BOCU	*Bouteloua curtipendula*	65–130	–
7				17–35	
	black grama	BOER4	*Bouteloua eriopoda*	17–35	–
8				65–130	
	blue grama	BOGR2	*Bouteloua gracilis*	65–130	–
9				6–32	
	James' galleta	PLJA	*Pleuraphis jamesii*	6–32	–
	sand dropseed	SPCR	*Sporobolus cryptandrus*	6–32	–
10				6–32	
	spike muhly	MUWR	*Muhlenbergia wrightii*	6–32	–
11				0–32	
	threeawn	ARIST	*Aristida*	0–32	–
	ring muhly	MUTO2	*Muhlenbergia torreyi*	0–32	–
Forb					
12				32–65	
	Forb, annual	2FA	*Forb, annual*	6–32	–
	Forb, perennial	2FP	*Forb, perennial*	6–32	–
	buckwheat	ERIOG	*Eriogonum*	6–32	–
	globemallow	SPHAE	*Sphaeralcea*	6–32	–
Shrub/Vine					
13				32–98	
	big sagebrush	ARTR2	*Artemisia tridentata*	32–98	–
14				32–98	
	fourwing saltbush	ATCA2	*Atriplex canescens*	32–98	–
15				0–65	
	winterfat	KRLA2	*Krascheninnikovia lanata*	0–65	–
16				0–32	
	Fremont's mahonia	MAFR3	*Mahonia fremontii*	0–32	–

Tree					
17				6–98	
	juniper	JUNIP	*Juniperus*	6–98	–
	twoneedle pinyon	PIED	*Pinus edulis*	6–46	–

Animal community

This site is suitable for grazing throughout most of the year with shrubs providing forage during the period when snow covers palatable grasses. Fast response to good management can be expected on this site.

There is a fair amount of diversity of plant growth and land form for wildlife. It lacks permanent water, however. Since the site usually occurs in rocky and steep areas, livestock do not compete heavily with wildlife in most cases. Typical animals found on the site are mule deer, wood rats, rabbits and raptors.

Recreational uses

The site is located on moderately sloping to steep, rocky hills. Shrubs and trees are interspersed with grassland and the site is usually quite stony. Winters are cold and spring is often very windy and dry. Late spring, summer, and fall provide pleasant recreational weather. Sport hunting is the primary recreational activity on the site. Photograhy, cross country riding, and wildlife observation are the main recreational activities.

Other information

T&E Species: Golden Eagles and prairie falcons may occasionally use this site.

Contributors

Larry D. Ellicott
Stephen Cassady
Unknown

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:**

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):**

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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:**
