

Ecological site R035XA125AZ Limy Upland 10-14" p.z. Shallow

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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.

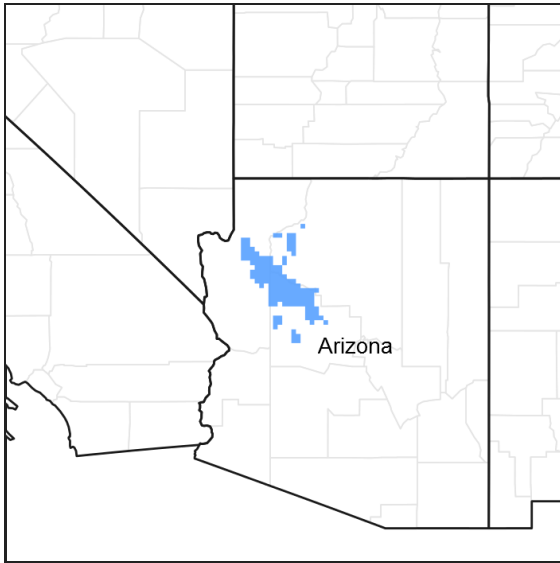


Figure 1. Mapped extent

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 35.1 - Colorado Plateau Mixed Grass Plains

Elevations range from 5100 to 6000 feet and precipitation averages 10 to 14 inches per year. Vegetation includes *Stipa* species, Indian ricegrass, galleta, and blue grama, fourwing saltbush, winterfat, and cliffrose. 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>Krascheninnikovia lanata</i>
Herbaceous	(1) <i>Bouteloua gracilis</i> (2) <i>Bouteloua eriopoda</i>

Physiographic features

Site occurs on shoulders and undulating hills on fan terraces, mesas and plateaus.

Table 2. Representative physiographic features

Landforms	(1) Hill (2) Mesa (3) Terrace
Flooding duration	Extremely brief (0.1 to 4 hours) to very brief (4 to 48 hours)
Flooding frequency	None to rare
Elevation	1,311–1,859 m
Slope	0–35%
Aspect	Aspect is not a significant factor

Climatic features

50-60% of moisture falls as rain Jul-Sept and is the most effective moisture for plant growth. The remaining moisture comes as snow during the winter.

Mean temperatures for the hottest month (Jul) is 72 degrees F; for the coldest month (Jan) is 32 degrees F. Extreme temperatures of 105 degrees F and -26 degrees F have been recorded. Long periods with little or no effective moisture are relatively common.

Cool season plants begin growth in early spring and mature in the early summer. Warm season plants take advantage of the summer rains and grow and retain their nutrition from July through September.

Table 3. Representative climatic features

Frost-free period (average)	160 days
Freeze-free period (average)	180 days
Precipitation total (average)	330 mm

Influencing water features

Soil features

Soils on this site are very shallow and shallow. Surface textures range from extremely gravelly coarse sandy loam, extremely gravelly loam, very gravelly loam, gravelly loam, gravelly sandy loam, to extremely gravelly sandy loam. Subsurface textures range from extremely gravelly sandy loam, gravelly loam, extremely cobbly loam, cobbly loam, very gravelly sandy clay loam, very gravelly fine sandy loam, to loam and gravelly sandy loam. pH ranges from 7.4 to 8.4. Moisture and temperature regimes are ustic aridic mesic.

Lime content averages 10 to 40% above the hard pan.

Typical taxonomic units include:

- SSA Coconino County Central part (631) MU Pastura grL-28;
- SSA Yavapai County Western part (637) MU's Abra-Pf, Pastura-PgB, PhD, PIB, PmB & PnB;
- SSA Mohave County Central part (697) MU's Pastern-89 & 105, Havasupai-106, Dean-128;
- SSA Hualapai-Havasupai area (699) MU's Havasupai-15 & 29, Rolie-8 & 35, Plaintiff-32 & Pastern-26.

Table 4. Representative soil features

Parent material	(1) Alluvium–conglomerate (2) Eolian deposits–limestone
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Surface texture	(1) Extremely gravelly sandy loam (2) Extremely gravelly loam (3) Gravelly sandy loam
Family particle size	(1) Loamy
Drainage class	Moderately well drained to well drained
Permeability class	Moderately slow to moderate
Soil depth	25–51 cm
Surface fragment cover <=3"	0–8%
Available water capacity (0-101.6cm)	0–12.7 cm
Calcium carbonate equivalent (0-101.6cm)	15–35%
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)	7.4–8.4
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 dominant aspect of the site is grassland with scattered shrubs. Major grasses are blue grama, black grama, grama and needle & thread. Shrubs like fourwing saltbush, winterfat and fremont barberry are present. Forbs are few.

Table 5. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Grass/Grasslike	273	420	588
Shrub/Vine	73	112	157
Forb	11	17	24
Tree	9	15	20
Total	366	564	789

Table 6. Ground cover

Tree foliar cover	0-1%
Shrub/vine/liana foliar cover	0-5%

Grass/grasslike foliar cover	15-30%
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	–	–	5-15%	0-1%
>0.15 <= 0.3	–	–	15-30%	–
>0.3 <= 0.6	–	0-2%	–	–
>0.6 <= 1.4	–	0-5%	–	–
>1.4 <= 4	0-1%	–	–	–
>4 <= 12	–	–	–	–
>12 <= 24	–	–	–	–
>24 <= 37	–	–	–	–
>37	–	–	–	–

Figure 5. Plant community growth curve (percent production by month). AZ3502, 35.1 10-14" p.z. black grama. Growth occurs mostly during the summer to early fall rainy season..

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	0	0	0	5	15	30	30	15	5	0	0

Figure 6. Plant community growth curve (percent production by month). AZ3511, 35.1 10-14" p.z. all sites. Growth begins in the spring and continues through the summer, most growth occurs during the summer rainy season.

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	0	1	5	11	18	25	24	13	3	0	0

Figure 7. Plant community growth curve (percent production by month). AZ5102, 35.1 10-14" p.z. blue grama. Growth occurs mostly 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	5	15	30	30	15	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 (%)
Grass/Grasslike					
1	Dominant grasses			280–443	
	blue grama	BOGR2	<i>Bouteloua gracilis</i>	168–235	–
	black grama	BOER4	<i>Bouteloua eriopoda</i>	56–123	–
	needle and thread	HECOC8	<i>Hesperostipa comata</i> ssp. <i>comata</i>	56–95	–
2	Other grasses			11–118	
	squirreltail	ELELE	<i>Elymus elymoides</i> ssp. <i>elymoides</i>	7–34	–
	sand dropseed	SPCR	<i>Sporobolus cryptandrus</i>	0–34	–
	Fendler's threeawn	ARPUF	<i>Aristida purpurea</i> var. <i>fendleriana</i>	7–26	–
	ring muhly	MUTO2	<i>Muhlenbergia torreyi</i>	0–17	–
	Indian ricegrass	ACHY	<i>Achnatherum hymenoides</i>	0–17	–
3	Annual grasses			6–28	
	Grass, perennial	2GP	<i>Grass, perennial</i>	6–28	–
Forb					
4	All forbs			7–34	
	globemallow	SPHAE	<i>Sphaeralcea</i>	7–13	–
	Forb, annual	2FA	<i>Forb, annual</i>	0–7	–
	Forb, perennial	2FP	<i>Forb, perennial</i>	0–7	–
	milkvetch	ASTRA	<i>Astragalus</i>	0–7	–
	fleabane	ERIGE2	<i>Erigeron</i>	0–7	–
	phlox	PHLOX	<i>Phlox</i>	0–7	–
Shrub/Vine					
5	Dominant shrubs			28–90	
	winterfat	KRLA2	<i>Krascheninnikovia lanata</i>	28–56	–
	fourwing saltbush	ATCA2	<i>Atriplex canescens</i>	6–28	–
6				39–67	
	Shrub, deciduous, broadleaf	2SDB	<i>Shrub, deciduous, broadleaf</i>	6–22	–
	broom snakeweed	GUSA2	<i>Gutierrezia sarothrae</i>	6–17	–
	Fremont's mahonia	MAFR3	<i>Mahonia fremontii</i>	6–17	–
	spineless horsebrush	TECA2	<i>Tetradymia canescens</i>	0–7	–
	banana yucca	YUBA	<i>Yucca baccata</i>	0–7	–
	mormon tea	EPVI	<i>Ephedra viridis</i>	0–7	–
Tree					
6	Trees			6–17	
	Utah juniper	JUOS	<i>Juniperus osteosperma</i>	3–17	–

Animal community

Site is favorable for grazing throughout most of the year except when snow cover restricts availability of forage. With continuous grazing use during winter and spring, the relatively scarce cool season mid grasses are replaced by burro grass, ring muhly, snakeweed and lower value forbs and grasses. Planned grazing systems adapt well to use

on this site.

The potential plant community produced by this site provides food for those species of wildlife that utilize grass as a major portion of their diet. When vegetative retrogression occurs, unpalatable shrubby species increase and some wildlife species may be benefit.

Recreational uses

Site is located on gently sloping plains and mesa tops which lend themselves to activities such as horseback riding, wildlife observation and hunting.

This site has a variety of spring and summer flowers which are particularly noticeable after good moisture periods. It has good aesthetic appeal when not severely disturbed.

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

Other information

Threatened and Endangered Species: Golden eagles and Prairie falcons occasionally use the site for feeding areas

Type locality

Location 1: Coconino County, AZ	
Township/Range/Section	T23N R6W S26
General legal description	Seligman West Quad - 1 mile west and 1 mile north of Seligman, AZ.

Contributors

Larry D. Ellicott
Steve Barker

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)	Karlyn Huling
Contact for lead author	NRCS Flagstaff Area Office
Date	03/23/2006
Approved by	S. Cassady
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

Indicators

1. **Number and extent of rills:** Rills should be very uncommon due to high amounts of rock fragment armor on the surface and in the profile. In steeper areas without the usual rock armor, there may be a few rills due to moderate permeability, rapid runoff, and shallow depth of soils.
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2. **Presence of water flow patterns:** Water flow patterns may be common due to moderate permeability, rapid runoff and shallow depth of soils.

3. **Number and height of erosional pedestals or terracettes:** A few pedestals and terracettes may occur, but they should be very short.

4. **Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):** Bare ground averages 50-60%. Areas with a higher cover of rock fragments or bedrock have less bare ground. Drought may cause an increase in bare ground. This site has an average available water capacity of only 1 inch, so the potential to produce plant cover is very low.

5. **Number of gullies and erosion associated with gullies:** None

6. **Extent of wind scoured, blowouts and/or depositional areas:** None

7. **Amount of litter movement (describe size and distance expected to travel):** Herbaceous and fine woody litter will be transported in water flow pathways. Coarse woody litter will remain under shrub and tree canopies.

8. **Soil surface (top few mm) resistance to erosion (stability values are averages - most sites will show a range of values):** Soil aggregate stability ratings average six under plant canopy and three in interspaces. Soil surface texture is mostly loam, with a few areas of sandy loam. Surface horizon is usually gravelly to extremely gravelly. There may be 60-75% cover of rock fragments on the surface. When well vegetated and/or protected by rock armor, soils have a high resistance to water erosion and a moderate to high resistance to wind erosion.

9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** Surface structure is platy (weak medium) or granular (weak fine). Surface thickness is mostly 1-2 inches. Color is variable depending upon parent material.

10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:** The site is characterized by a relatively uniform distribution of mostly grasses with some shrubs and a few forbs. Some locations have an open scattered tree canopy. Canopy cover averages 35% (30% grasses, 1% forbs, 4% shrubs, 1% trees). Basal plant cover averages 7%.

11. **Presence and thickness of compaction layer (usually none; describe soil profile features which may be mistaken for compaction on this site):** Soils are not generally at risk for compaction due to the high content of gravel and cobbles in the profile. In areas without much rock armor, most soils will be easily compacted. About half the soils have a naturally platy surface structure.

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: warm season bunchgrasses >

Sub-dominant: cool season bunchgrasses = shrubs = warm season colonizing grasses >

Other: Minor: Forbs >

Trace: trees = cacti = Agave family

Additional:

13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):** All plant functional groups are adapted to survival except in the most severe droughts. Severe winter droughts affect shrubs and trees the most. Severe summer droughts affect grasses the most.
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14. **Average percent litter cover (%) and depth (in):** Mostly herbaceous litter with some woody litter. Litter amounts increase during the first few years of drought, then decrease in later years.
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15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):** 250-400 pounds per acre (dry weight) in drought years, 400-600 pounds per acre in median years, 600-800 pounds per acre in wet years.
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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:** Broom snakeweed and ring muhly are native to the site, but they have the potential to increase and dominate the area after heavy grazing. Cheatgrass is an exotic plant that can invade and dominate the site regardless of management.
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17. **Perennial plant reproductive capability:** All plants native to the site are adapted to the climate and are capable of producing seeds, stolons and rhizomes except during the most severe drought.
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