

Ecological site R035XG717AZ

Shallow Loamy 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.

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.

Ecological site concept

This range site occurs in an upland position on nearly level to gently rolling hillsides. Slopes generally range from 1 to 15 percent, but may be as high as 30 percent. Soils are very shallow to shallow (less than 20" to bedrock). Surface textures are fine sandy loam to loam. Underlying layers have textures of loam to clay. Gravel, cobble and stones cover 10-50% of the soil surface and occupy 10-50% of the soil profile.

Table 1. Dominant plant species

Tree	(1) <i>Juniperus osteosperma</i> (2) <i>Pinus edulis</i>
Shrub	(1) <i>Atriplex canescens</i> (2) <i>Krascheninnikovia lanata</i>
Herbaceous	(1) <i>Hesperostipa comata</i> (2) <i>Bouteloua gracilis</i>

Physiographic features

This range site occurs in an upland position on nearly level to gently rolling hillsides. It neither benefits significantly nor suffers excessively from runoff. Slopes generally range from 1 to 15 percent, but may be as high as 30 percent. Elevations range from 5,500 to 7,000 feet.

Table 2. Representative physiographic features

Landforms	(1) Hill (2) Plateau
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Flooding frequency	None
Ponding frequency	None
Elevation	1,680 – 2,130 m
Slope	0 – 30 %
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)	150 days
Freeze-free period (average)	170 days
Precipitation total (average)	460 mm

Influencing water features

This is an upland site, and is not associated with water features or wetlands. During heavy rain events, this site may receive run-on moisture from landforms above and contribute runoff to landforms below.

Soil features

Soils are very shallow to shallow (less than 20" to bedrock). Surface textures are fine sandy loam to loam. Underlying layers have textures of loam to clay. Gravel, cobble and stones cover 10-50% of the soil surface and occupy 10-50% of the soil profile. Soils are fertile, usually have good structure, and take in water readily. Available water capacity, however, is limited by soil depth. Fissures in bedrock, on the other hand, generally contain fine soil particles and store some moisture. Plant roots penetrate these cracks and crevices and, thus, have access to more moisture and plant nutrients than are apparent in the soil. Severe erosion can occur if the soil is not properly protected.

Typical taxonomic units include:

SSA-633 Navajo County Area, Central Part MU's 15 & 53 Deama;
 SSA-637 Yavapai County Western part MU's SnD & WcC Cabezon and SbB Pastura;
 SSA-697 Mohave County Central part MU's 4 Lithic Haplustolls, 111 Tricon family.

Table 4. Representative soil features

Surface texture	(1) Gravelly loam (2) Fine sandy loam (3) Stony loam
Family particle size	(1) Loamy
Drainage class	Well drained
Permeability class	Slow to moderate
Soil depth	20 – 50 cm
Available water capacity (0-101.6cm)	3.66 – 9.07 cm
Calcium carbonate equivalent (0-101.6cm)	40 %
Electrical conductivity (0-101.6cm)	Not specified
Soil reaction (1:1 water) (0-101.6cm)	6.1 – 8.4
Subsurface fragment volume <=3" (Depth not specified)	10 – 70 %
Subsurface fragment volume >3" (Depth not specified)	10 – 60 %

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 Reference 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

Additional community tables

Table 5. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
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Table 6. Community 1.2 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
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Table 7. Community 1.3 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
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Table 8. Community 2.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
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Table 9. Community 2.2 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
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Table 10. Community 2.3 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
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Table 11. Community 3.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
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Table 12. Community 3.2 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
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Table 13. Community 4.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
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Table 14. Community 4.2 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
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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. This site will respond to management rather slowly, particularly on spots which have historically been concentrated areas. Brush management should generally be discouraged. This site has excellent diversity in the plant community. As regrowth occurs, brushy species dominate the site. This is an important winter range for many large game species. The shrub component of the site is particularly important for food and cover.

Recreational uses

This site occurs as gentle rolling hills and is characterized as grassland intermixed with shrubs and trees. The site generally has warm summers and cold winters. During the spring and winter months, this site commonly experiences high winds. Hunting is the primary

recreational use for the site. Secondary activities include camping, hiking, backpacking and wildlife observation.

Other information

T&E Species: Golden eagle and prairie falcon (for feeding)

Type locality

Location 1: Navajo County, AZ	
Township/Range/Section	T17N R14E S30
General legal description	Aja homestead south of Winslow, Arizona. On East Sunset Mesa south of Winslow, Arizona.

Contributors

Larry D. Ellicott
Stephen Cassady
Steve Barker
Unknown

Approval

Kendra Moseley, 5/19/2025

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)	Karlynn Huling
Contact for lead author	NRCS Flagstaff Area Office
Date	05/15/2006
Approved by	
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

Indicators

1. **Number and extent of rills:** A few minor rills may form due to loamy textures, slow permeability, shallow depth, and medium to rapid runoff, especially on steeper slopes. Rill formation will be reduced if the soil has a lot of rock fragment armor and/or a large amount of rock fragments in the profile.

2. **Presence of water flow patterns:** Water flow patterns may be common due to slow permeability, shallow depth and medium to rapid runoff. There will be more water flow patterns on steeper areas and in areas with more rock outcrop and/or very shallow (<10") soils.

3. **Number and height of erosional pedestals or terracettes:** Some pedestals and terracettes may form, 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):** This site has an average available water capacity of only 2 inches, so the potential to produce plant cover is very low. Bare ground may be as high as 50%. Areas with a greater cover of rock fragments and/or rock outcrop have less bare ground. Drought may cause an increase in bare ground.

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. Litter movement may be greater on very shallow soils.

8. **Soil surface (top few mm) resistance to erosion (stability values are averages - most sites will show a range of values):** Soil surface texture is generally fine sandy loam, loam, or clay loam. Most surface horizons contain a significant amount of rock fragments (gravels, channers, flagstones, or stones). Many soils have 10-50% surface cover of rock fragments. Aggregate stability values average 5 under plant canopies, and 4 in the interspaces. Blue grama root mats increase the stability of the soils. When well vegetated or covered with rock armor, the soils have a moderate to high resistance to water erosion and a 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 predominantly granular (weak to moderate, very fine or fine to medium) with some areas that are platy (weak, thin or medium or thick) or subangular blocky (weak, fine). Surface thickness ranges from 1-7 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:** This site is characterized by a relatively uniform distribution of mostly grasses with some shrubs. Some areas have up to 25% canopy of trees. Canopy cover measured in one area was 35% (mostly in grasses). Basal cover of plants measured in one area was 4% (all grasses. The cover (especially basal cover) is reduced by the amount of rock fragment and/or bedrock ground cover. Both canopy and basal cover values (especially canopy cover) decrease during a prolonged drought. This type of plant community is moderately effective at capturing and storing precipitation.

11. **Presence and thickness of compaction layer (usually none; describe soil profile features which may be mistaken for compaction on this site):** None. Due to loamy surface textures, the soils may be easily compacted in at least part of the surface 10 inches unless there is a large amount of rock fragment armor on the surface or within the surface horizons. Some of 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: none

Sub-dominant: Cool season bunchgrasses = warm season bunchgrasses > shrubs >

Other: Minor: warm season colonizing grasses = trees > Trace: forbs = cacti

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 in all years except during the most severe droughts. Severe winter droughts affect shrubs and trees the most. Severe summer droughts affect grasses the most. Very shallow (<10") woils will show the most mortality in all functional groups.

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.

15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):**
600-650 pounds (dry weight) per acre in drought years, 650-825 pounds per acre in median years, 825-950 pounds per acre in wet years.

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, pricklypear cactus, and cholla cactus are native to the site, but have the potential to increase and dominate the area after heavy grazing. Utah juniper, oneseed juniper, and Colorado pinyon are native to the site, but should generally comprise less than 25% canopy cover. Heavy grazing and fire exclusion can sometimes cause these trees to dominate the area.

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 in most years except during the most severe droughts.
