

# Ecological site R035XA102AZ Tephra Hills, Loamy 10-14" p.z.

Accessed: 05/03/2024

## 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.

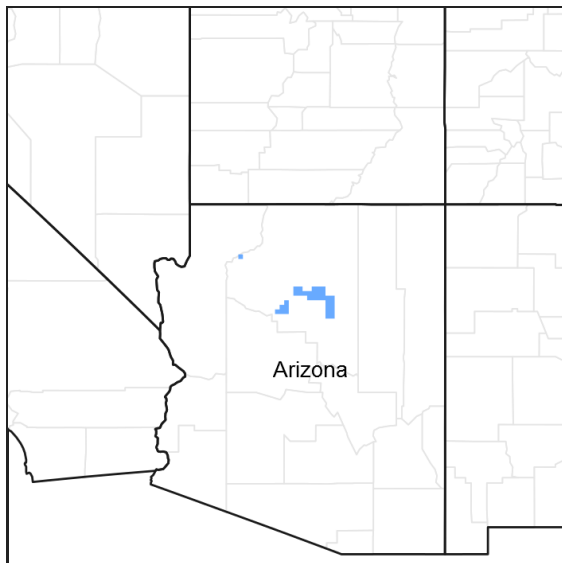


Figure 1. Mapped extent

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

“PROVISIONAL ecological site concepts developed and described. See Project Plan [insert Project Plan Name] for more details and related milestones.”

This ecological site occurs in Land Resource Unit 35.1 - the Colorado Plateau Mixed Grass Plains

Elevations range from 5300 to 6500 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.

## Ecological site concept

“ATTENTION: This ecological site meets the requirements for PROVISIONAL (if not more). A provisional ecological site is established after ecological site concepts are developed and an initial state-and-transition model is drafted. A provisional ecological site typically will include literature reviews, land use history information, legacy data (prior

approved range site descriptions, forage suitability groups, woodland suitability groups, etc.), and includes some soils data, and estimates for canopy and/or species composition by weight,. A provisional ecological site provides the conceptual framework of soil-site correlation for the development of the ESD. For more information about this ecological site, please contact your local NRCS office.”

**Table 1. Dominant plant species**

Tree	Not specified
Shrub	(1) <i>Fallugia paradoxa</i>
Herbaceous	(1) <i>Eriogonum</i>

## Physiographic features

This site occurs as cinder cones, cinder plains and cinder slopes. The geomorphic position of this site occurs on slopes of cinder cones.

**Table 2. Representative physiographic features**

Landforms	(1) Cinder cone (2) Plain
Flooding duration	Extremely brief (0.1 to 4 hours)
Flooding frequency	None to rare
Ponding duration	Very brief (4 to 48 hours)
Ponding frequency	None to rare
Elevation	1,524–2,134 m
Slope	1–65%
Aspect	Aspect is not a significant factor

## Climatic features

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

Mean temperature for the hottest month (Jul) is 72 F; for the coldest month (Jan) is 32 F. Extreme temperatures of 105 F and -28F have been recorded. Long periods with little or no effective moisture are relatively common.

Cool season plants begin growth in early spring and mature early summer. Warm season plants take advantage of summer rains and are growing and nutritious Jul-Sep.

**Table 3. Representative climatic features**

Frost-free period (average)	160 days
Freeze-free period (average)	180 days
Precipitation total (average)	356 mm

## Influencing water features

### Soil features

Wupatki is Cindery, very deep with restrictive features (strongly contrasting particle size)

Lomaki is cindery very deep

Nalakai is deep-contrasting particle size gives it a restriction even though it's very deep

Wukoki ashy-skeletal/fragmental very deep; strongly contrasting particle size

Effective soil depth may be affected by strongly contrasting particle size classes; plants may benefit by precipitation lingering on this "shelf".

Typical taxonomic units include:

SSA Central Coconino County(AZ631)

MU's -

Wukoki 59, 67

Wukoki very cindery loam 68, 69;

Nalaki very cindery loam 24;

Lomaki very cindery loam 24; Wupatki very cindery loam 68,9:

SSA Little Colorado River Area (AZ707)

MU's

67, 68 Wukoki

68 Wupatki

The above series within these soil surveys most likely need to be re-correlated; the original shallow to hardpan plant production data will be re-located to Limy Upland, Shallow R035XA125AZ. This data was most likely collected at the stabilized bases of cinder cones and Limy Upland, Shallow better reflects the production values, species composition, and shallow soils at those sites. The existing correlation statement will not be removed until these soils have been re-correlated in NASIS.

The map units listed below have been correlated after the migration of historic data to Limy Upland, Shallow. These mapunits are correctly correlated.

Wupatki National Monument Soil Survey, part of Soil Survey Area Arizona 631, Coconino County, Arizona

Map Unit

626-Cindery, Vitrandic Torriorthents, 20-64 percent slopes

**Table 4. Representative soil features**

Parent material	(1) Cinders–pyroclastic rock
Drainage class	Well drained to somewhat excessively drained
Permeability class	Moderate to moderately rapid
Soil depth	13–152 cm
Surface fragment cover <=3"	45–55%
Available water capacity (0-101.6cm)	0–3.81 cm
Soil reaction (1:1 water) (0-101.6cm)	7.5–9
Subsurface fragment volume <=3" (Depth not specified)	35–45%

## Ecological dynamics

This site occur on cinder hills. These sites are relatively young, and are in the early stages of soil formation and plant succession. There are the less-weathered phases of Non-Vegetated and the sheltered areas with increased collection of organic matter and eolian accumulation, which have limited amounts of herbaceous species. As the cinders weather and organic matter accumulates, there is a phase change from State 1 Phase 1.1 to State 1, Phase 1.2.

Original historic production data will be moved to Limy Upland, Shallow R035XA125AZ as this data better reflects the original intentions of Limy Upland, Shallow. Production data cited here for the Reference site is collected from Wupatki National Monument, Coconino County, Arizona near the boundary with the Coconino National Forest in

## State and transition model

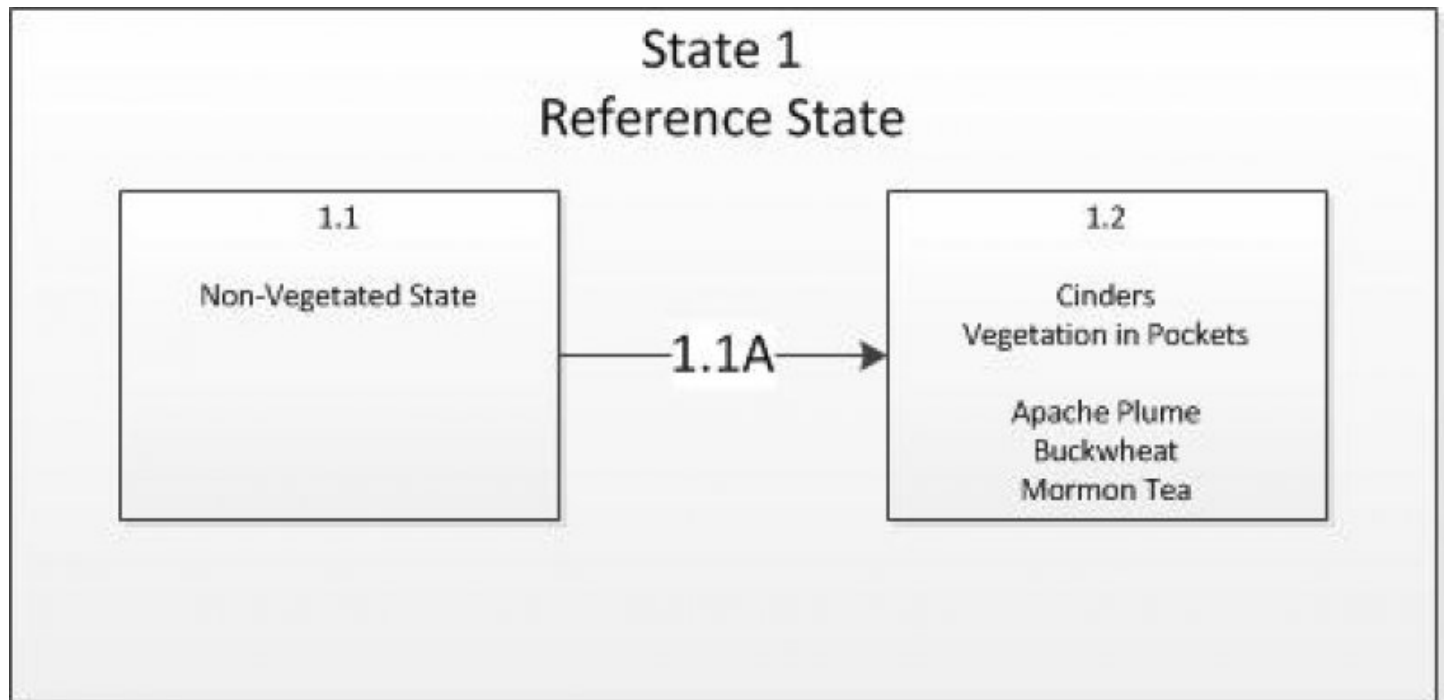


Figure 4. Cinder Hills

### State 1 Reference State

#### Community 1.1 Non-Vegetated Phase



Figure 5. Non-Vegetated Cinder Hills

This community phase has essentially no vegetation. This is an early colonization area, and somewhat erosive, making it difficult to have established plants on the sideslopes and summits of cindercones.

#### Community 1.2 Sparsely Vegetated Phase

This phase has sparse herbaceous vegetation on backslopes and summits of cinder cones in protected areas.

Table 5. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Shrub/Vine	–	63	90
<b>Total</b>	–	<b>63</b>	<b>90</b>

## Additional community tables

Table 6. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Kg/Hectare)	Foliar Cover (%)
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Table 7. Community 1.2 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Kg/Hectare)	Foliar Cover (%)
<b>Shrub/Vine</b>					
1				0–90	
	Apache plume	FAPA	<i>Fallugia paradoxa</i>	0–90	–
	Cutler's jointfir	EPCU	<i>Ephedra cutleri</i>	0–56	–

## Animal community

This site is suitable for grazing at any time of the year by all livestock types. Planned grazing systems can be readily adapted for use on this site. Mechanical improvement practices, such as chaining, pitting or seeding would not be adaptable to this site; however, this site will respond relatively fast to good management.

The nearly level to steep topography adds habitat diversity to the site. Juniper stands have developed in many areas as a result of fire exclusion and overgrazing. These tree forms increase diversity of wildlife.

## Wood products

Even though Juniper can develop on this site as a result of fire exclusion and overgrazing there is not enough production for commercial firewood harvesting or posts.

## Type locality

Location 1: Apache County, AZ	
General legal description	Near old highway 666 seven miles northwest of Springerville, AZ

## Contributors

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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)	Jennifer Puttere
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Contact for lead author	Flagstaff MLRA Soil Survey Office
Date	08/02/2012
Approved by	
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

## Indicators

1. **Number and extent of rills:** No rills on this site due to extensive surface tephra.  

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2. **Presence of water flow patterns:** No water flow patterns on this site; the surface of this site is not mineral soil but rather tephra.  

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3. **Number and height of erosional pedestals or terracettes:** No erosional pedestals or terracettes on this site.  

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4. **Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):** No unprotected bare ground on this site; site is covered in tephra  

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5. **Number of gullies and erosion associated with gullies:** No gullies on this site  

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6. **Extent of wind scoured, blowouts and/or depositional areas:** Around shrubs on the site there are depositional areas of cinders. As cinders erode down the slope they accumulate under the slopes forming small dunes of lightly weathered cinders and ash.  

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7. **Amount of litter movement (describe size and distance expected to travel):** Most of the litter remains where it falls; some will move downslope with water. There is little wind erosion on the site due to the protection of the cinders.  

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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):** Stability values range from 1-2. The site is stable due to the tephra covering the surface. The mineral soil is not strongly developed.  

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9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** Weak surface structure; soil is not strongly developed. The tephra surface gives the site stability.  

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10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:** In areas with shrubs infiltration is higher; however, the shrubs on this site are sparse and clumpy. The tephra helps keep water on the site but because of slope the runoff is high.  

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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):** No compaction layer 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: Shrubs>>>forbs

Sub-dominant:

Other:

Additional: No grasses present on site.

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13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):** Some individual shrub mortality due to drought on-site

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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):** <100 lb/acre

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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:** No invasives on site

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17. **Perennial plant reproductive capability:** Good reproduction; lots of seeds and flowers present on site

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