

**Ecological site R039XA104AZ**  
**Loamy Upland 17-22" p.z.**

Last updated: 9/05/2019  
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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.

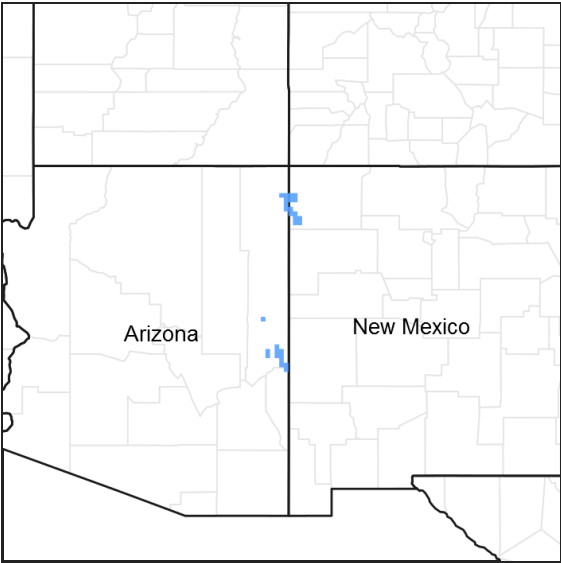


Figure 1. Mapped extent

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): 039X–Mogollon Transition North

AZ 39.1 Mogollon Plateau Coniferous Forests

Elevations range from 7000 to 12,500 feet and precipitation averages 20 to 35 inches per year. Vegetation includes ponderosa pine, Gambel oak, Arizona walnut, sycamore, Douglas fir, blue spruce, Arizona fescue, sheep fescue, mountain muhly, muttongrass, junegrass, pine dropseed, and dryland sedges. The soil temperature regime ranges from mesic to frigid and the soil moisture regime ranges from typic ustic to udic 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) <i>Pinus ponderosa</i> (2) <i>Juniperus deppeana</i>
Shrub	(1) <i>Chrysothamnus</i>

Herbaceous	(1) <i>Festuca arizonica</i> (2) <i>Festuca ovina</i>
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## Physiographic features

This site occurs in an upland position on rolling hills, cinder cones and basalt flows. It neither benefits from run-in of moisture from adjacent areas nor does it suffer excessive loss from run-off, unless denuded of its vegetation.

**Table 2. Representative physiographic features**

Landforms	(1) Hill (2) Cinder cone
Elevation	2,134–2,743 m
Slope	15–25%
Aspect	Aspect is not a significant factor

## Climatic features

About 40% of the moisture in this Common Resource Area (CRA), or Land Resource Unit (LRU) comes as rain from June to September. The remainder comes from October to May as snow or light rain. Extreme temperatures of 97 and -37 degrees Fahrenheit have been recorded. Some moisture is usually received every month.

**Table 3. Representative climatic features**

Frost-free period (average)	168 days
Freeze-free period (average)	120 days
Precipitation total (average)	559 mm

## Influencing water features

### Soil features

The soils on this site are deep (40-60") and formed from basic igneous rock(ash and tuff). Surface textures include gravelly loam, cobbly loam and gravelly silt loam from four to ten inches thick. Subsurface textures include gravelly caly loam to cobbly clay loam. Hazard of water erosion is slight to moderate depending on slope. Gravel, cobble and stones are on the surface and throughout the profile, but they are less than 50 percent of the soil by volume. Typical taxonomic units include: SSA 635 Apache County central part - MU's CaB, CaC, CaD Cambern and FuC Fruitland, cold variant AND SSA-683 MU's 33D, 34D, 35E, 36B, 37C, 38B & 39B Gordo.

**Table 4. Representative soil features**

Surface texture	(1) Gravelly loam (2) Cobbly loam (3) Gravelly silt loam
Family particle size	(1) Loamy
Drainage class	Moderately well drained to well drained
Permeability class	Moderate to moderately slow
Soil depth	102–152 cm
Surface fragment cover <=3"	0–35%
Surface fragment cover >3"	0–15%
Soil reaction (1:1 water) (0-101.6cm)	6.3–6.8

Subsurface fragment volume <=3" (Depth not specified)	5–30%
Subsurface fragment volume >3" (Depth not specified)	5–20%

## 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

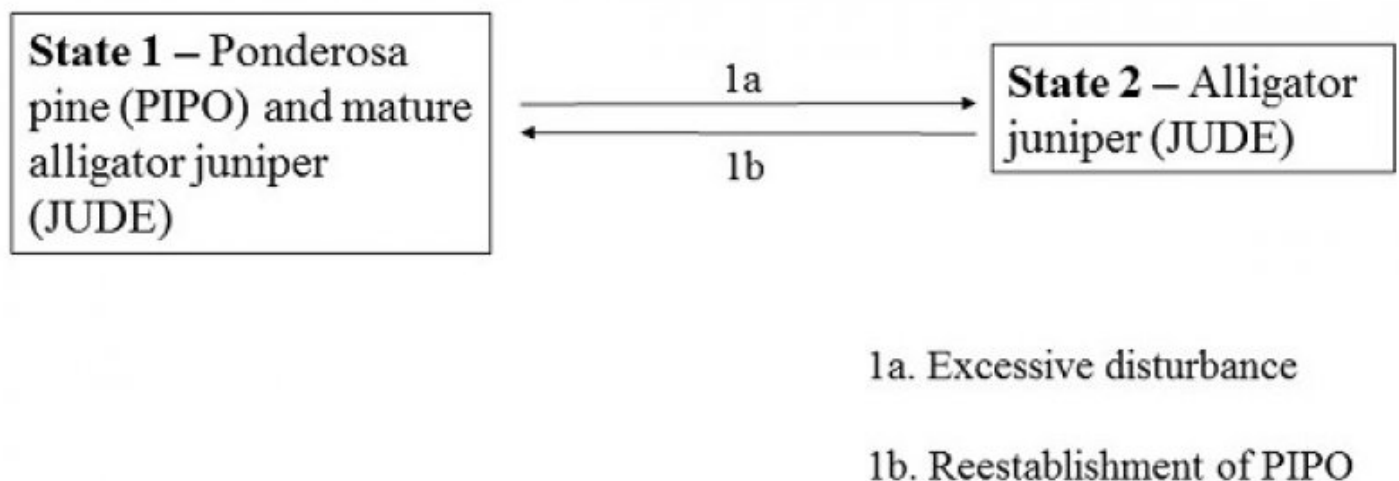


Figure 4. MLRA 39 (17-22"), Loamy Upland

## State 1 Historic Climax Plant Community

### Community 1.1 Historic Climax Plant Community

This site has a plant community made up primarily of mid and short grasses with a relatively small percentage of forbs, shrubs and trees. In the potential plant community there is a mixture of both cool and warm season grasses. Plant species most likely to invade or increase on this site following disturbance are Arizona fescue, rabbitbrush, ponderosa pine and annuals. Continuous livestock use during the late spring will decrease cool season grasses, which are replaced by lower value plants.

Table 5. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Grass/Grasslike	1211	1287	1362
Forb	76	99	121
Tree	61	68	76
Shrub/Vine	7	8	9
Total	1355	1462	1568

Figure 6. Plant community growth curve (percent production by month).  
AZ3911, 39.1 17-22" p.z. all sites. Growth begins in the spring, most growth occurs during the summer rainy season..

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	0	5	10	10	10	20	20	20	5	0	0

Additional community tables

Table 6. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Kg/Hectare)	Foliar Cover (%)
<b>Tree</b>					
0				16–121	
	ponderosa pine	PIPO	<i>Pinus ponderosa</i>	16–76	–
	alligator juniper	JUDE2	<i>Juniperus deppeana</i>	6–28	–
	oneseed juniper	JUMO	<i>Juniperus monosperma</i>	0–22	–
	twoneedle pinyon	PIED	<i>Pinus edulis</i>	0–22	–
<b>Shrub/Vine</b>					
0				0–16	
	rabbitbrush	CHRY9	<i>Chrysothamnus</i>	0–16	–
<b>Grass/Grasslike</b>					
0				1211–1362	
	mountain muhly	MUMO	<i>Muhlenbergia montana</i>	76–228	–
	blue grama	BOGR2	<i>Bouteloua gracilis</i>	0–228	–
	muttongrass	POFE	<i>Poa fendleriana</i>	84–174	–
	Arizona fescue	FEAR2	<i>Festuca arizonica</i>	90–157	–
	pine dropseed	BLTR	<i>Blepharoneuron tricholepis</i>	76–151	–
	squirreltail	ELELE	<i>Elymus elymoides</i> ssp. <i>elymoides</i>	76–151	–
	prairie Junegrass	KOMA	<i>Koeleria macrantha</i>	30–151	–
	Canada bluegrass	POCO	<i>Poa compressa</i>	73–140	–
	Idaho fescue	FEID	<i>Festuca idahoensis</i>	84–112	–
	sheep fescue	FEOV	<i>Festuca ovina</i>	84–112	–
	sedge	CAREX	<i>Carex</i>	16–76	–
	spike muhly	MUWR	<i>Muhlenbergia wrightii</i>	16–76	–
	little bluestem	SCSC	<i>Schizachyrium scoparium</i>	0–46	–
<b>Forb</b>					
0				76–121	
	cinquefoil	POTEN	<i>Potentilla</i>	7–17	–
	Forb, annual	2FA	<i>Forb, annual</i>	11–17	–
	buckwheat	ERIOG	<i>Eriogonum</i>	6–17	–
	pingue rubberweed	HYRI	<i>Hymenoxys richardsonii</i>	7–17	–
	Wright's deervetch	LOWR	<i>Lotus wrightii</i>	9–17	–
	mullein	VERBA	<i>Verbascum</i>	9–13	–
	lupine	LUPIN	<i>Lupinus</i>	6–11	–
	yarrow	ACHIL	<i>Achillea</i>	3–11	–
	pussytoes	ANTEN	<i>Antennaria</i>	6–11	–
	milkvetch	ASTRA	<i>Astragalus</i>	6–11	–
	thistle	CIRSI	<i>Cirsium</i>	6–11	–

## Animal community

This site is suitable for grazing by all classes of livestock. The site is used primarily as late spring to early fall seasonal range. When grazed with sites with less accessibility and productivity, this site is normally a key management area. Mechanical forms of brush management should be restricted to slopes less than 20 percent.

This site has relatively poor habitat diversity in the native plant community. It is primarily adapted to grassland wildlife species except at the edge of timber where it is utilized by many species. Large game animals are migratory onto the site primarily for summer use.

## Recreational uses

This site has a variety of summer flowers. Open grassland which abruptly joins the timber edge makes the site aesthetically pleasing.

Summers are cool and pleasant but winters are harsh and cold.

Hunting, camping, photography and wildlife observation are favorite activities.

## Type locality

Location 1: Apache County, AZ	
Township/Range/Section	T5N R31E S16
General legal description	About 3 miles east of Alpine, AZ in Apache county. Also on Parks road about 6.5 miles north of Parks, AZ in Coconino county.

## Contributors

Larry D. Ellicott

Steve Barker

## Approval

Scott Woodall, 9/05/2019

## 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):**
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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):**

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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:**

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