Ecological site R039XA138AZ
Clay Loam Upland
17-22 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): 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.

Associated sites

F039XA134AZ	**Limestone Upland 17-22" p.z. (PIPO)**
F039XA135AZ	**Basalt Hills 17-22" p.z. (PIPO, QUGA)**
R039XA129AZ	**Clay Bottom 17-22"**

Table 1. Dominant plant species

Tree	(1) *Pinus ponderosa*
Shrub	(1) *Ericameria nauseosa ssp. nauseosa var. glabrata*
Herbaceous	(1) *Muhlenbergia montana* (2) *Festuca arizonica*

Physiographic features

This site occurs on plateaus, hills and fan remnants. The soils are moderately deep (20-40") to deep (40-60") and noneffervescent throughout. The site does not benefit significantly from run-on moisture from adjacent sites.

Table 2. Representative physiographic features

Landforms	(1) Plateau (2) Hill (3) Mesa
Elevation	1,830 – 2,440 m
Slope	0 – 20 %
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)	170 days
Freeze-free period (average)	120 days
Precipitation total (average)	560 mm

Influencing water features

There are no water features associated with this site.

Soil features

The soils characterizing this site are moderately deep (20-40") to deep (40-60") and noneffervescent throughout. The surface soil textures include Gravelly, cobbly or very stoney loam and is generally about 7 to 11 inches deep. The subsurface textures include gravelly clay loam, very gravelly clay and cobbly loam and have slow permability. The site can absorb most or all of the moisture the climate supplies. With good vegetative cover the infiltration rate is slow. Coarse fragments average from 15 to 55 percent of the soil volume.
Typical taxonomic units include: SSA 695 Navajo Depot - MU's 4-Fallsam family and Smolan family, 5-Gavlin family, 7-Ligai family, 10 & 11-Nibley family and 15-Kellypoint family.

Table 4. Representative soil features

Surface texture	(1) Gravelly loam (2) Cobbly loam (3) Very stony loam
Family particle size	(1) Loamy

Drainage class	Moderately well drained to well drained
Permeability class	Moderately slow to slow
Soil depth	50 – 150 cm
Surface fragment cover >3"	20 – 60 %
Available water capacity (0-101.6cm)	0.18 – 0.53 cm
Calcium carbonate equivalent (0-101.6cm)	Not specified
Electrical conductivity (0-101.6cm)	Not specified
Sodium adsorption ratio (0-101.6cm)	Not specified
Soil reaction (1:1 water) (0-101.6cm)	6.6 – 7.8
Subsurface fragment volume >3" (Depth not specified)	20 – 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 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

Additional community tables

Table 5. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
Tree					
0				7-22	
	ponderosa pine	PIPO	*Pinus ponderosa*	7-22	–
Shrub/Vine					
0				11-45	
	rubber rabbitbrush	ERNAG	*Ericameria nauseosa ssp. nauseosa var. glabrata*	7-22	–
	pingue rubberweed	HYRI	*Hymenoxys richardsonii*	7-22	–
Grass/Grasslike					
0				39-84	
	blue grama	BOGR2	*Bouteloua gracilis*	36-73	–
	muhly	MUHLE	*Muhlenbergia*	0-7	–
	deergrass	MURI2	*Muhlenbergia rigens*	0-7	–
1				504-572	
	mountain muhly	MUMO	*Muhlenbergia montana*	256-327	–
	Arizona fescue	FEAR2	*Festuca arizonica*	182-256	–
	pine dropseed	BLTR	*Blepharoneuron tricholepis*	36-73	–
	spike muhly	MUWR	*Muhlenbergia wrightii*	29-44	–
	Ross' sedge	CARO5	*Carex rossii*	7-22	–
	squirreltail	ELELE	*Elymus elymoides ssp. elymoides*	0-7	–
	prairie Junegrass	KOMA	*Koeleria macrantha*	0-7	–
	muttongrass	POFE	*Poa fendleriana*	0-7	–
	little bluestem	SCSC	*Schizachyrium scoparium*	0-7	–
	black dropseed	SPIN5	*Sporobolus interruptus*	0-7	–
	nodding brome	BRAN	*Bromus anomalus*	0-7	–
Forb					
2				34-95	
	white sagebrush	ARLU	*Artemisia ludoviciana*	29-44	–
	pussytoes	ANTEN	*Antennaria*	7-15	–
	aster	ASTER	*Aster*	0-7	–
	Indian paintbrush	CASTI2	*Castilleja*	0-7	–
	iris	IRIS	*Iris*	0-7	–
	flax	LINUM	*Linum*	0-7	–
	lupine	LUPIN	*Lupinus*	0-7	–
	beardtongue	PENST	*Penstemon*	0-7	–
	cinquefoil	POTEN	*Potentilla*	0-7	–
	ragwort	SENEC	*Senecio*	0-7	–
3				17-62	
	western yarrow	ACMIO	*Achillea millefolium var. occidentalis*	7-15	–
	sandwort	ARENA	*Arenaria*	7-15	–
	redroot buckwheat	ERRA3	*Eriogonum racemosum*	7-15	–

	spurge	EUPHO	*Euphorbia*	0-7	–
	mustard	BRASS2	*Brassica*	0-7	–
	thistle	CIRSI	*Cirsium*	0-7	–
	weakleaf bur ragweed	AMCO3	*Ambrosia confertiflora*	0-7	–

Animal community

This site is well suited for all classes of livestock. It is used primarily for late spring, summer and early fall grazing. Prescribed Grazing systems are essential to maintain the plant community balance on the site. This site offers a fair diversity in the vegetative complex for wildlife. In higher condition classes the site is most suitable to grassland wildlife species. As retrogression occurs the woody species increase and wildlife species utilizing the site may change.

Recreational uses

This site has a variety of summer flowers. It has excellent aesthetic appeal because of the open grassland appearance. Summers are cool and pleasant but winters are harsh and cold. Hunting, camping, hiking, cross-country skiing, photography and wildlife observation are favorite activities.

Type locality

Location 1: Coconino County, AZ	
Township/Range/Section	T21N R5E S10
General legal description	Bellemont, AZ Quad, SE1/4, SW1/4, Section 10, T21N, R5E, Coconino County, AZ.

Contributors

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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:**

   _____

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:

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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:**
