

Ecological site R039XA130AZ **Loamy Bottom 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.

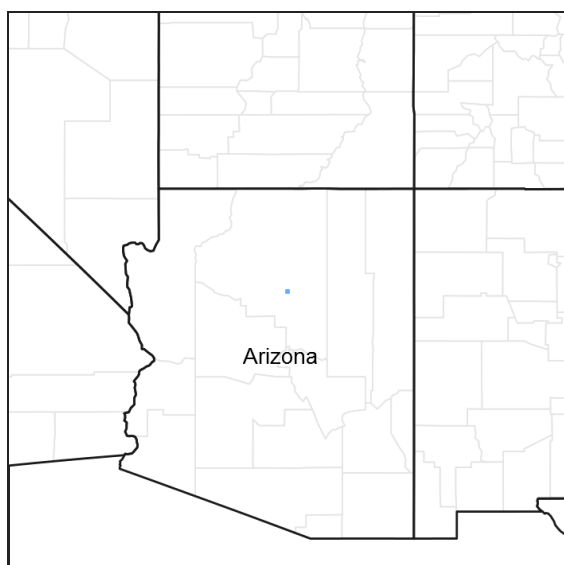


Figure 1. Mapped extent

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.

Associated sites

R039XA131AZ	Loamy Bottom 17-22" p.z. Subirrigated
R039XA137AZ	Loamy Upland 17-22" p.z. Subirrigated
R039XA138AZ	Clay Loam Upland 17-22 p.z.

Similar sites

R039XA129AZ	Clay Bottom 17-22"
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Table 1. Dominant plant species

Tree	(1) <i>Pinus ponderosa</i>
Shrub	(1) <i>Ericameria nauseosa</i> ssp. <i>nauseosa</i> var. <i>glabrata</i>
Herbaceous	(1) <i>Muhlenbergia wrightii</i> (2) <i>Poa compressa</i>

Physiographic features

This site occurs on valley floors as narrow to broad drainageways. The site does benefit from run-in moisture from adjacent areas.

Table 2. Representative physiographic features

Landforms	(1) Alluvial flat (2) Drainageway
Flooding duration	Very brief (4 to 48 hours) to brief (2 to 7 days)
Flooding frequency	None to occasional
Ponding duration	Brief (2 to 7 days) to long (7 to 30 days)
Ponding frequency	Occasional to frequent
Elevation	1,829–2,438 m
Slope	0–2%
Ponding depth	0–3 cm
Water table depth	36–102 cm
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

This site experiences occasional to frequent ponding, the duration ranging from brief to long. It experiences non to occasional flooding, the duration ranging from very brief to brief.

Soil features

The soils in this site are very deep. Surface textures include loam to about 3 inches thick. Subsurface textures include gravelly clay loam, very gravelly clay and sandy clay. Hazard of erosion is moderate. Typical taxonomic units include: from SSA-695 Kaibab NF area MU's 3-Crossplain Family.

Table 4. Representative soil features

Surface texture	(1) Loam
Family particle size	(1) Clayey
Drainage class	Poorly drained to somewhat poorly drained
Permeability class	Moderately slow to slow
Soil depth	152–178 cm
Surface fragment cover <=3"	0–35%
Available water capacity (0-101.6cm)	0.36–0.53 cm
Calcium carbonate equivalent (0-101.6cm)	0–1%
Electrical conductivity (0-101.6cm)	0–2 mmhos/cm
Sodium adsorption ratio (0-101.6cm)	0–2
Soil reaction (1:1 water) (0-101.6cm)	7.4–7.8
Subsurface fragment volume <=3" (Depth not specified)	0–35%

Ecological dynamics

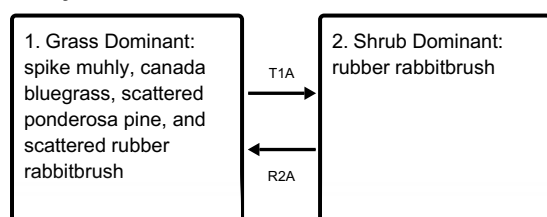
The plant communities found on an ecological site are naturally variable. Composition and production will vary with yearly conditions, location, aspect, and the natural variability of the soils. The historical climax plant community represents the natural potential plant communities found on relict or 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

Ecosystem states



State 1 submodel, plant communities

1.1. Historic Climax
Plant Community

State 1
Grass Dominant: spike muhly, canada bluegrass, scattered ponderosa pine, and scattered rubber rabbitbrush

This state is grass dominant with scattered trees and shrubs.

Community 1.1
Historic Climax Plant Community

The historic climax plant community of this site is dominated by a variety of grasses and forbs.

Table 5. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Grass/Grasslike	807	829	852
Forb	45	67	90
Shrub/Vine	–	9	18
Tree	–	4	9
Total	852	909	969

Figure 5. 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

State 2
Shrub Dominant: rubber rabbitbrush

This state shows a decrease in grass and an increase in rubber rabbitbrush.

Transition T1A
State 1 to 2

Excessive disturbance such as periodic fire, ground disturbing recreation, and continuous, season-long grazing will cause a threshold to be crossed to a rubber rabbitbrush state.

Restoration pathway R2A
State 2 to 1

An increase in soil organic carbon and a decrease in bare ground will help restore the system.

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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Tree				
0				0–7
	ponderosa pine	PIPO	<i>Pinus ponderosa</i>	0–7
Shrub/Vine				
0				0–34
	rubber rabbitbrush	ERNAG	<i>Ericameria nauseosa</i> ssp. <i>nauseosa</i> var. <i>glabrata</i>	0–15
	pingue rubberweed	HYRI	<i>Hymenoxys richardsonii</i>	0–15
	Woods' rose	ROWOW	<i>Rosa woodsii</i> var. <i>woodsii</i>	0–7
3				7–28
	aster	ASTER	<i>Aster</i>	7–15
	cinquefoil	POTEN	<i>Potentilla</i>	0–7
	sandwort	ARENA	<i>Arenaria</i>	0–7
Grass/Grasslike				
0				168–420
	spike muhly	MUWR	<i>Muhlenbergia wrightii</i>	110–219
	deergrass	MURI2	<i>Muhlenbergia rigens</i>	36–73
	mountain muhly	MUMO	<i>Muhlenbergia montana</i>	0–36
	pine dropseed	BLTR	<i>Blepharoneuron tricholepis</i>	0–36
	Ross' sedge	CARO5	<i>Carex rossii</i>	7–22
	rush	JUNCU	<i>Juncus</i>	7–22
	Grass, annual	2GA	<i>Grass, annual</i>	7–15
	little bluestem	SCSC	<i>Schizachyrium scoparium</i>	0–7
	nodding brome	BRAN	<i>Bromus anomalus</i>	0–7
1				129–269
	Canada bluegrass	POCO	<i>Poa compressa</i>	110–182
	slender wheatgrass	ELTRT	<i>Elymus trachycaulus</i> ssp. <i>trachycaulus</i>	7–22
	western wheatgrass	PASM	<i>Pascopyrum smithii</i>	7–22
	squirreltail	ELELE	<i>Elymus elymoides</i> ssp. <i>elymoides</i>	7–15
	Arizona fescue	FEAR2	<i>Festuca arizonica</i>	0–7
	prairie Junegrass	KOMA	<i>Koeleria macrantha</i>	0–7
	Fendler's threeawn	ARPUF	<i>Aristida purpurea</i> var. <i>fendleriana</i>	0–7
	muttongrass	POFE	<i>Poa fendleriana</i>	0–7
2				11–73
	mat muhly	MURI	<i>Muhlenbergia richardsonis</i>	0–36
	blue grama	BOGR2	<i>Bouteloua gracilis</i>	9–22
	tufted hairgrass	DECE	<i>Deschampsia cespitosa</i>	0–15
Forb				
0				28–118
	iris	IRIS	<i>Iris</i>	7–15
	Lewis flax	LILE3	<i>Linum lewisii</i>	7–15

	western yarrow	ACMIO	<i>Achillea millefolium var. occidentalis</i>	7–15	–
	pussytoes	ANTEN	<i>Antennaria</i>	7–15	–
	white sagebrush	ARLU	<i>Artemisia ludoviciana</i>	0–7	–
	milkvetch	ASTRA	<i>Astragalus</i>	0–7	–
	thistle	CIRSI	<i>Cirsium</i>	0–7	–
	horsetail	EQUIS	<i>Equisetum</i>	0–7	–
	redroot buckwheat	ERRA3	<i>Eriogonum racemosum</i>	0–7	–
	strawberry	FRAGA	<i>Fragaria</i>	0–7	–
	lupine	LUPIN	<i>Lupinus</i>	0–7	–
	dock	RUMEX	<i>Rumex</i>	0–7	–

Animal community

This site is suitable for all classes of livestock for spring through fall grazing use. The site will produce substantial amounts of high quality forage in average precipitation years. This site responds relatively quickly to good management. It adapts well to grazing systems which provide for an occasional rest. Proper stocking rates are important. This site is very susceptible to erosion, particularly overgrazed areas, old roads, cattle trails, and concentration areas.

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.

Hydrological functions

This site acts as a buffer strip between the uplands and wash channels. therefore it is important to keep this site well vegetated to protect water quality.

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 S20
General legal description	Garland Prairie 7 1/2 Min. Quad, Camp Navajo, SE1/4 NE1/4 Sec 20 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:

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):**
-

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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