USDA Natural Resources Conservation Service

Ecological site R038XA110AZ
Meadow 12-16

Last updated: 9/05/2019
Accessed: 05/20/2025

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.

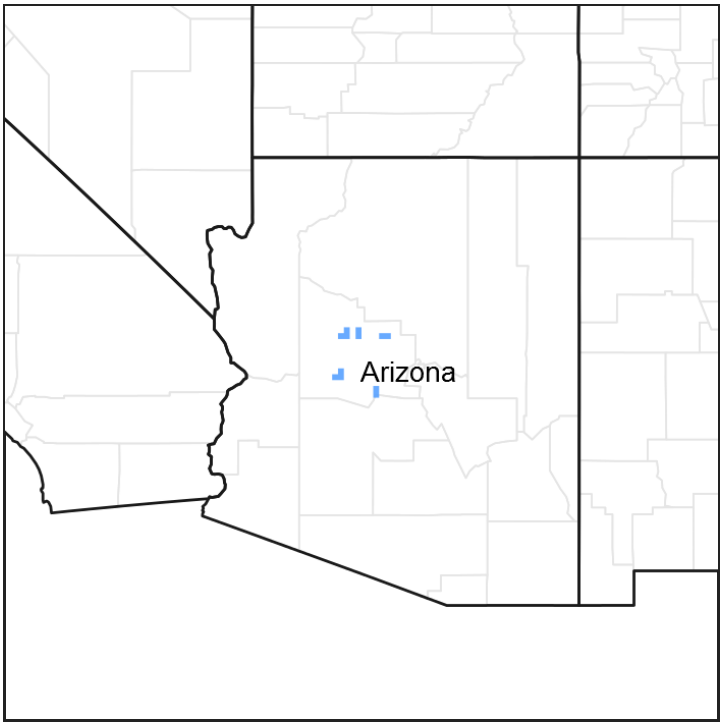

Figure 1. Mapped extent

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): 038X–Mogollon Transition South

AZ 38.1 – Lower Mogollon Transition

Elevations range from 3000 to 4500 feet and precipitation averages 12 to 16 inches per year. Vegetation includes canotia, one-seed juniper, mesquite, catclaw acacia, jojoba, turbinella oak, ratany, shrubby buckwheat, algerita, skunkbush, tobosa, vine mesquite, bottlebrush squirreltail, grama species, curly mesquite, desert needlegrass and New Mexico feathergrass. The soil temperature regime is thermic and the soil moisture regime is ustic aridic. This unit occurs within the Transition Zone Physiographic Province and is characterized by canyons and structural troughs or valleys. Igneous, metamorphic and sedimentary rock classes occur on rough mountainous terrain in association with less extensive sediment filled valleys exhibiting little integrated drainage.

Ecological site concept

This site occurs in a bottom position and benefits significantly from run-in moisture supplied by surrounding areas and from sub-irrigation.

Soils on this site are deep and somewhat poorly drained. They formed in recent mixed alluvium.

Table 1. Dominant plant species

Tree	Not specified
Shrub	Not specified
Herbaceous	Not specified

Physiographic features

This site occurs in a bottom position and benefits significantly from run-in moisture supplied by surrounding areas and from sub-irrigation.

Table 2. Representative physiographic features

Landforms	(1) Flood plain (2) Swale
Flooding duration	Very brief (4 to 48 hours) to brief (2 to 7 days)
Flooding frequency	Occasional to frequent
Ponding duration	Very brief (4 to 48 hours) to brief (2 to 7 days)
Ponding frequency	Occasional
Elevation	1,219–1,829 m
Slope	0–1%
Water table depth	25–30 cm
Aspect	Aspect is not a significant factor

Climatic features

Precipitation in this common resource area averages 12 to 16 inches annually. The winter-summer rainfall ratio ranges from about 60/40% in the northwest part of the area to 50/50% in the southeast part. Summer rains fall July through September; are from high-intensity, convective thunderstorms. This moisture originates primarily from the Gulf of Mexico, but can come from the remnants of Pacific hurricanes in September. Winter moisture is frontal, originates in the north Pacific, and falls as rain or snow in widespread storms of low intensity and long duration. Snowfall ranges from a trace to 10 inches per year and can occur from November through March. Snow seldom persists for more than a day except on north aspects. May and June are the driest months of the year. Humidity is generally low all year. Average annual air temperatures range from 59 to 70 degrees F (thermic temperature regime). Daytime temperatures in the summer are commonly in the high 90’s. Freezing temperatures are common from October through April, usually during the night or early morning hours. The actual precipitation, available moisture and temperature vary, depending on, region, elevation, rain shadow effect and aspect.

Table 3. Representative climatic features

Frost-free period (average)	230 days
Freeze-free period (average)	285 days
Precipitation total (average)	406 mm

Influencing water features

This site occurs in a bottom position and benefits significantly from run-in moisture supplied by surrounding areas and from sub-irrigation.

Soil features

Soils on this site are deep and somewhat poorly drained. They formed in recent mixed alluvium. Surfact textures include loam and fine sandy loam, subsurface textures include clay loam, sandy clay loam and fine sandy loam. Available water capacity is high but drainage is slow. Typical taxonomic units mapped on this site include: SSA-637 Yavapai County Western Part MU Lynx, wet variant-Lz; SSA-639 Black Hills-Sedona Area MU's Feps fsl-443, Feps fsl flooded-651 & Feps L Subirrigated-652.

Table 4. Representative soil features

Surface texture	(1) Loam (2) Fine sandy loam
Family particle size	(1) Loamy

Drainage class	Somewhat poorly drained to poorly drained
Permeability class	Moderate to moderately slow
Soil depth	102–152 cm
Available water capacity (0-101.6cm)	17.78–25.4 cm
Calcium carbonate equivalent (0-101.6cm)	0–5%
Soil reaction (1:1 water) (0-101.6cm)	7.4–8.4

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

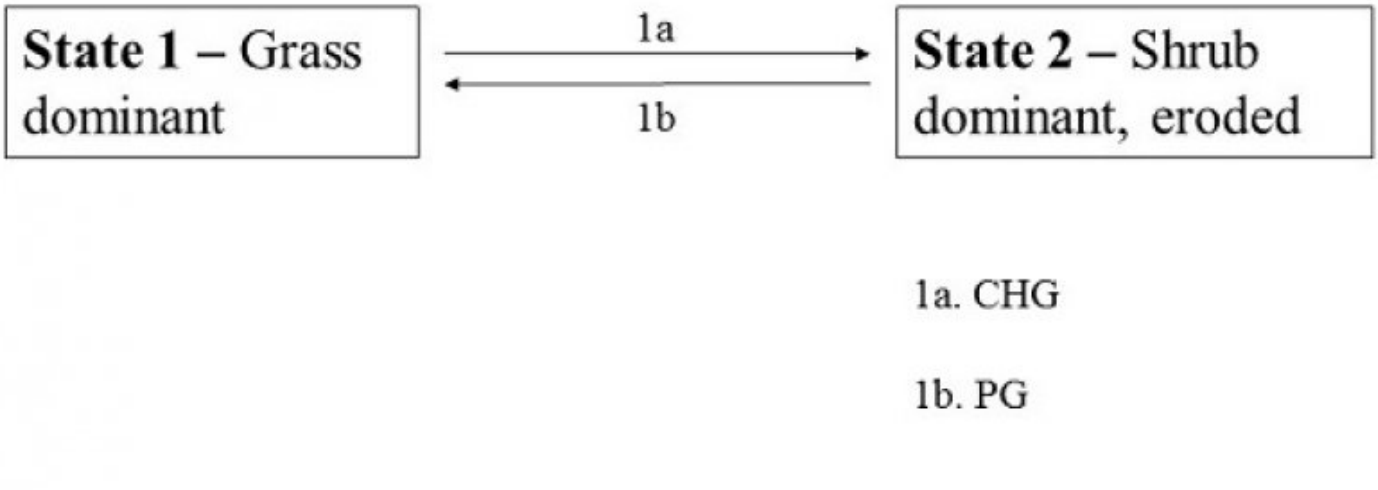

Figure 4. MLRA 38.1 (12-16"), Meadow

State 1
Historic Climax Plant Community

Community 1.1
Historic Climax Plant Community

This site has a plant community of short and midgrasses, forbs, sedges and rushes, and some shrubs. Overstory vegetation consisits of riparian trees. Plant species most likely to increase or invade when the site is disturbed or in poor health are rabbitbrush and annuals. Continuous use during the late winter and spring periods causes a decrease in the cool season midgrasses which are replaced by lower value forage plants.

Table 5. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Grass/Grasslike	2452	2697	2942
Forb	211	231	252
Shrub/Vine	211	224	241
Tree	–	77	155
Total	**2874**	**3229**	**3590**

Figure 6. Plant community growth curve (percent production by month). AZ3811, 38.1 12-16" p.z. all sites. Growth begins in the spring, most growth occurs in the summer..

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	0	1	7	15	20	22	20	10	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 (%)
Grass/Grasslike					
1	**Perennial Grasses**			2466–2929	
	alkali sacaton	SPAI	*Sporobolus airoides*	1079–1388	–
	vine mesquite	PAOB	*Panicum obtusum*	771–1079	–
	western wheatgrass	PASM	*Pascopyrum smithii*	308–463	–
	sedge	CAREX	*Carex*	239–252	–
	rush	JUNCU	*Juncus*	224–252	–
	blue grama	BOGR2	*Bouteloua gracilis*	93–185	–
	mat muhly	MURI	*Muhlenbergia richardsonis*	0–62	–
Forb					
2	**Forbs**			155–308	
	Forb, perennial	2FP	*Forb, perennial*	78–168	–
	Forb, annual	2FA	*Forb, annual*	76–140	–
Shrub/Vine					
3	**Shrubs**			155–196	
	Apache plume	FAPA	*Fallugia paradoxa*	62–155	–
	chrysactinia	CHRYS	*Chrysactinia*	31–93	–
	pale desert-thorn	LYPA	*Lycium pallidum*	0–62	–
Tree					
4	**Tree**			0–155	
	Fremont cottonwood	POFR2	*Populus fremontii*	0–155	–

Animal community

This site is suitable for yearlong grazing by all classes of livestock. It is also susceptible to flooding, but due to it high productivity can be used for cropland, pastureland or rangeland. When ppossible these sites should be fenced and managed separately from other sites.

The site provides some riparian vegetation for food and shelter for wildlife, thus ic could be a concentration zone for many species of wildlife.

Recreational uses

This site is located on nearly level flood plains and swales and is characterized by grassland with grasslike plants, shrubs and some riparian trees. The summers are warm and the winters are cold.
Activities suited to this site include wildlife observation, photography, hunting, hiking and horseback riding.

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:**

---

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):**

---

14. **Average percent litter cover (%) and depth (in):**

---

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:**

---

17. **Perennial plant reproductive capability:**
