

Ecological site R038XA107AZ Loamy Bottom 12-16 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.

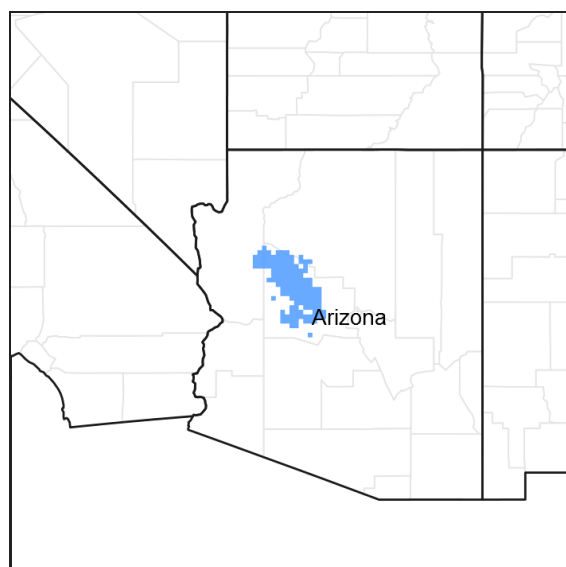


Figure 1. Mapped extent

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): 038X–Mogollon Transition South

AZ 38.1 – Lower Mogollon Transition

Elevations range from 3,000 to 4,500 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

The Loamy Bottom ecological site occurs in bottom positions and benefits significantly from run-in moisture delivered by adjacent areas.

Soils which characterize the Loamy Bottom ecological site are deep to any plant restricting layers. It is well drained and formed in recent mixed alluvium weathered from granite, schist, basalt, sandstone, and limestone. It usually

occurs as recent mixed alluvium on flood plains, alluvial fans, and swales. Surface textures range from sandy loam to loam.

Table 1. Dominant plant species

Tree	Not specified
Shrub	(1) <i>Atriplex canescens</i> (2) <i>Eriogonum wrightii</i>
Herbaceous	(1) <i>Pascopyrum smithii</i> (2) <i>Bouteloua curtipendula</i>

Physiographic features

The Loamy Bottom ecological site occurs in bottom positions and benefits significantly from run-in moisture delivered by adjacent areas.

Table 2. Representative physiographic features

Landforms	(1) Flood plain (2) Swale (3) Alluvial fan
Flooding duration	Extremely brief (0.1 to 4 hours) to brief (2 to 7 days)
Flooding frequency	Rare to occasional
Elevation	914–1,372 m
Slope	0–5%
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 percent in the northwest part of the area to 50/50 percent 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

The Loamy Bottom ecological site occurs in bottom positions and benefits significantly from run-in moisture delivered by adjacent areas.

Soil features

Soils which characterize the Loamy Bottom ecological site are deep to any plant restricting layers. It is well drained and formed in recent mixed alluvium weathered from granite, schist, basalt, sandstone, and limestone. It usually occurs as recent mixed alluvium on flood plains, alluvial fans, and swales. Surface textures range from sandy loam to loam. Subsurface textures range from loamy sand and sandy loam to clay loam. Coarse fragments range from 5 to 30 percent. Water erosion hazard is slight. Typical taxonomic units on this site include: SSA-637 Yavapai County Western Part MU's Cordes variant-Cy, Lynx-AmC, AyC, BIC, Ly, Ly2, MrC, Wo; and SSA-697 Mohave County Central Part MU Manikan-22.

Table 4. Representative soil features

Parent material	(1) Alluvium–granite
Surface texture	(1) Sandy loam (2) Loam
Family particle size	(1) Loamy
Drainage class	Moderately well drained to well drained
Permeability class	Moderately slow to moderately rapid
Soil depth	102–152 cm
Surface fragment cover <=3"	0–30%
Available water capacity (0-101.6cm)	14.99–25.15 cm
Calcium carbonate equivalent (0-101.6cm)	5–15%
Soil reaction (1:1 water) (0-101.6cm)	7.3–7.8

Ecological dynamics

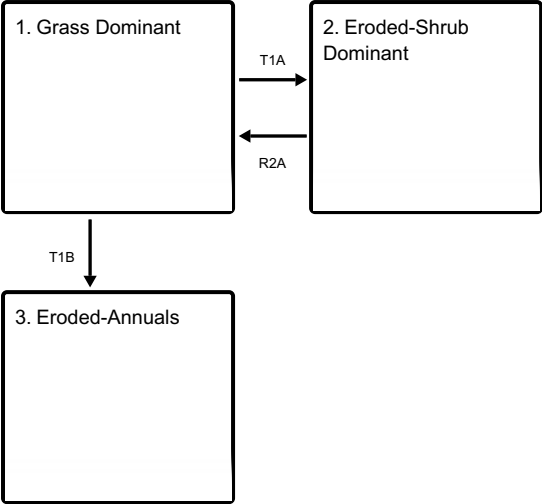
The plant communities found on an ecological site are naturally variable. Composition and production will vary with yearly conditions, location, aspect, and the natural variability of the soils. The historical climax plant community represents the natural potential plant communities found on relict or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

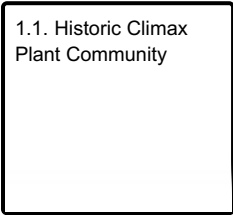
NRCS uses a Similarity Index to compare existing plant communities to the plant communities described here. Similarity Index is determined by comparing the production and composition of a plant community to the production and composition of a plant community described in the Loamy Bottom ecological site 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



State 1
Grass Dominant

Community 1.1
Historic Climax Plant Community

This site has a mixed plant community made up of a shrub overstory and mixed midgrass and shortgrass understory with a relatively small percentage of forbs. In the original plant community there is a mixture of both cool-season and warm-season grasses. Plant species most likely to invade or increase on this site when disturbed or deteriorated, are rubber rabbitbrush, annuals, and some of the chaparral species. Continuous use during the late winter and spring periods decreases the cool-season midgrasses, and they 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	757	1110	1513
Shrub/Vine	50	101	168
Forb	–	34	84
Total	807	1245	1765

Figure 5. 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

State 2
Eroded-Shrub Dominant

State 3
Eroded-Annuals

Transition T1A
State 1 to 2

Continuous herbivory during the growing season with no rest and excessive stocking rate.

Transition T1B
State 1 to 3

Extensive soil loss due to management.

Restoration pathway R2A
State 2 to 1

Managing herbivory over many years to slowly restore soil, plant, and water function. This restoration will include managing for length of graze period, utilization of primary production, and timing, or season of use.

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	Dominant Perennial Grasses			953–1121	
	sideoats grama	BOCU	<i>Bouteloua curtipendula</i>	202–269	–
	western wheatgrass	PASM	<i>Pascopyrum smithii</i>	202–269	–
	blue grama	BOGR2	<i>Bouteloua gracilis</i>	108–202	–
	vine mesquite	PAOB	<i>Panicum obtusum</i>	135–202	–
	hairy grama	BOHI2	<i>Bouteloua hirsuta</i>	67–135	–
	tobosagrass	PLMU3	<i>Pleuraphis mutica</i>	67–135	–
2	Other grasses			45–370	
	alkali sacaton	SPAI	<i>Sporobolus airoides</i>	0–67	–
	sand dropseed	SPCR	<i>Sporobolus cryptandrus</i>	0–67	–
	sedge	CAREX	<i>Carex</i>	13–67	–
	squirreltail	ELELE	<i>Elymus elymoides</i> ssp. <i>elymoides</i>	13–40	–
	common wolfstail	LYPH	<i>Lycurus phleoides</i>	13–40	–
	threeawn	ARIST	<i>Aristida</i>	0–27	–
	mat muhly	MURI	<i>Muhlenbergia richardsonis</i>	0–22	–
	ring muhly	MUTO2	<i>Muhlenbergia torreyi</i>	0–22	–
	spike muhly	MUWR	<i>Muhlenbergia wrightii</i>	0–22	–
Forb					
3	Forbs			0–67	
	Forb, annual	2FA	<i>Forb, annual</i>	0–34	–
	Forb, perennial	2FP	<i>Forb, perennial</i>	0–34	–
Shrub/Vine					
4	Shrubs			67–135	
	bastardsage	ERWR	<i>Eriogonum wrightii</i>	27–67	–
	fourwing saltbush	ATCA2	<i>Atriplex canescens</i>	27–67	–
	rubber rabbitbrush	ERNAG	<i>Ericameria nauseosa</i> ssp. <i>nauseosa</i> var. <i>glabrata</i>	0–27	–
	Apache plume	FAPA	<i>Fallugia paradoxa</i>	0–27	–

Animal community

The Loamy Bottom ecological site is favorable for grazing by all classes of livestock. It will respond readily to good management and prescribed grazing systems. When the site occurs in a large contiguous area it will normally be the key management area.

The Loamy Bottom ecological site has relatively poor habitat diversity. As retrogression occurs and brushy species increase then habitat diversity also increases. Brush management practices should be designed to maintain cover near water.

Recreational uses

The Loamy Bottom ecological site is found in grassy swales and flood plains, characterized by open grasslands interspersed with a few flowering forbs and shrubs.

Winters are cold, however, relatively mild spring, fall, and summer months are attractive to recreationists.

Activities include hunting, cross-country riding, photography, hiking, and wildlife observation.

Type locality

Location 1: Yavapai County, AZ	
Township/Range/Section	T13N R1E S3
General legal description	One-half mile east of South West corner Section 3, T15N, R2W. One-half mile North West Dewey on State Highway 89, Section 3, T13N, R1E.

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)	Karlynn Huling
Contact for lead author	Flagstaff Area Office
Date	05/17/2006
Approved by	S. Cassady
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

Indicators

- 1. Number and extent of rills:** Some rills may form due to loamy surface textures, moderate permeability, moderate runoff and the location of the site on flood plains.

- 2. Presence of water flow patterns:** Water flow patterns will be common due to moderate permeability, moderate runoff, and the location of the site on flood plains.

- 3. Number and height of erosional pedestals or terracettes:** Pedestals and terracettes may be common due to loamy surface textures and the occasional-to-frequent flooding.

- 4. Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):** This site has an average available water capacity of 11 inches, so it has a high potential for the

production of plant cover. Drought may cause an increase in bare ground.

5. **Number of gullies and erosion associated with gullies:** Occasional gullies may form due to the location of the site on flood plains.
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6. **Extent of wind scoured, blowouts and/or depositional areas:** There may be occasional areas with blowouts or deposition by wind if plant cover and litter are removed and the soil is exposed by flooding.
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7. **Amount of litter movement (describe size and distance expected to travel):** Herbaceous, fine woody, and coarse woody litter will be transported throughout the site during periodic flood events. Herbaceous and fine woody litter will also be transported in water flow pathways during heavy rain events.
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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):** Soil surface structure is mostly loam, without any rock fragments. When well vegetated and not subject to severe flood events, the soils have a moderate to high resistance to both water and wind erosion.
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9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** Soil surface structure is either granular (moderate, fine) or platy (medium to thick). The surface thickness is generally 2 inches. Color is variable depending upon parent material.
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10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:** This site is characterized by a patchy distribution of mostly grasses with a few shrubs and forbs. Both canopy and basal cover values decrease during a prolonged drought. This type of plant community is highly effective at capturing and storing moisture from precipitation and flooding.
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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):** The soils may be easily compacted due to loamy textures, lack of rock fragments, and occasional-to-frequent moisture from flooding. Many of the soils have a naturally platy surface structure.
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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: warm-season bunchgrasses

Sub-dominant: warm-season colonizing grasses cool-season colonizing grasses

Other: Minor: shrubs sedges = cool-season bunchgrasses = forbs

Trace: none

Additional:

13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):** All plant functional groups are adapted to survival in all years except during the most severe droughts. Severe winter drought affects shrubs and trees most. Severe summer drought affects grasses the most.
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14. **Average percent litter cover (%) and depth (in):** Mostly herbaceous litter with some woody litter. Litter amounts increase during the first few years of drought, then decrease in later years.
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15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):** 900 to 1,050 pounds per acre (dry weight) in drought years, 1,050 to 1,350 pounds per acre in median years, 1,350 to 1,500 pounds per acre in wet years.
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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:** Rubber rabbitbrush is native to the site, but has the potential to increase and dominate with heavy grazing. Saltcedar tamarisk is an exotic shrub that can invade and dominate the site, especially in areas that have the most frequent flooding.
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17. **Perennial plant reproductive capability:** All plants native to the site are adapted to the climate and are capable of producing seed, stems, and rhizomes in most years except during the most severe droughts.
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