USDA Natural Resources
Conservation Service

Ecological site R038XA111AZ
Sandy Bottom 12-16

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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.

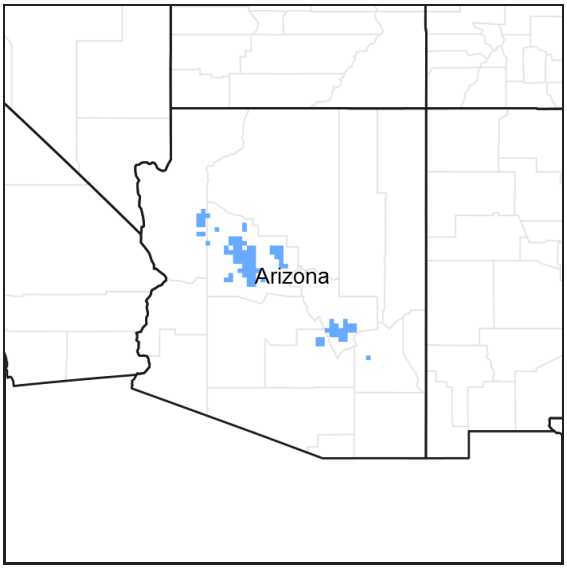

Figure 1. Mapped extent

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 MLRA 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 Sandy Bottom ecological site occurs as sandy benches along creeks and drainageways and as swales. The site receives extra moisture due to flooding or from run-off of adjacent upland sites.

The soils mapped on this site are deep, and well drained to excessively well drained. They are stream alluvium formed from volcanic, granitic, and limestone sources.

Table 1. Dominant plant species

Tree	(1) *Populus angustifolia*
Shrub	(1) *Rhus trilobata* (2) *Eriogonum wrightii*
Herbaceous	(1) *Bouteloua curtipendula* (2) *Panicum obtusum*

Physiographic features

The Sandy Bottom ecological site occurs as sandy benches along creeks and drainageways and as swales. The site receives extra moisture due to flooding or from run-off of adjacent upland sites.

Table 2. Representative physiographic features

Landforms	(1) Swale
Flooding duration	Very brief (4 to 48 hours) to brief (2 to 7 days)
Flooding frequency	Occasional to frequent
Elevation	3,000–4,500 ft
Slope	0–3%
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)	16 in

Influencing water features

The Sandy Bottom ecological site receives extra moisture due to flooding or from run-off of adjacent upland sites.

Soil features

The soils mapped on the Sandy Bottom ecological site are deep, and well to excessively well drained. They are stream alluvium formed from volcanic, granitic, and limestone sources. Typical taxonomic units mapped on this site include: SSA-627 Mohave County Southern Part MU Fluvaquents-102; SSA-637 Yavapai County Western Part MU's Cordes Sandy Loam-Cx and LtB; SSA-639 Black Hills-Sedona area MU's Bodecker-400, 401, 415, 419, and 601; SSA-675 San Carlos Indian Reservation MU Bodecker-655; SSA-697 Mohave County Central Part MU's

Cordes-22 and Riverwash-22.

Table 4. Representative soil features

Parent material	(1) Alluvium–volcanic breccia
Surface texture	(1) Sandy loam (2) Extremely gravelly sandy loam
Family particle size	(1) Loamy
Drainage class	Well drained to excessively drained
Permeability class	Moderately rapid to very rapid
Soil depth	40–60 in
Surface fragment cover <=3"	0–65%
Calcium carbonate equivalent (0-40in)	0–5%
Soil reaction (1:1 water) (0-40in)	7.5–8
Subsurface fragment volume <=3" (Depth not specified)	0–75%

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

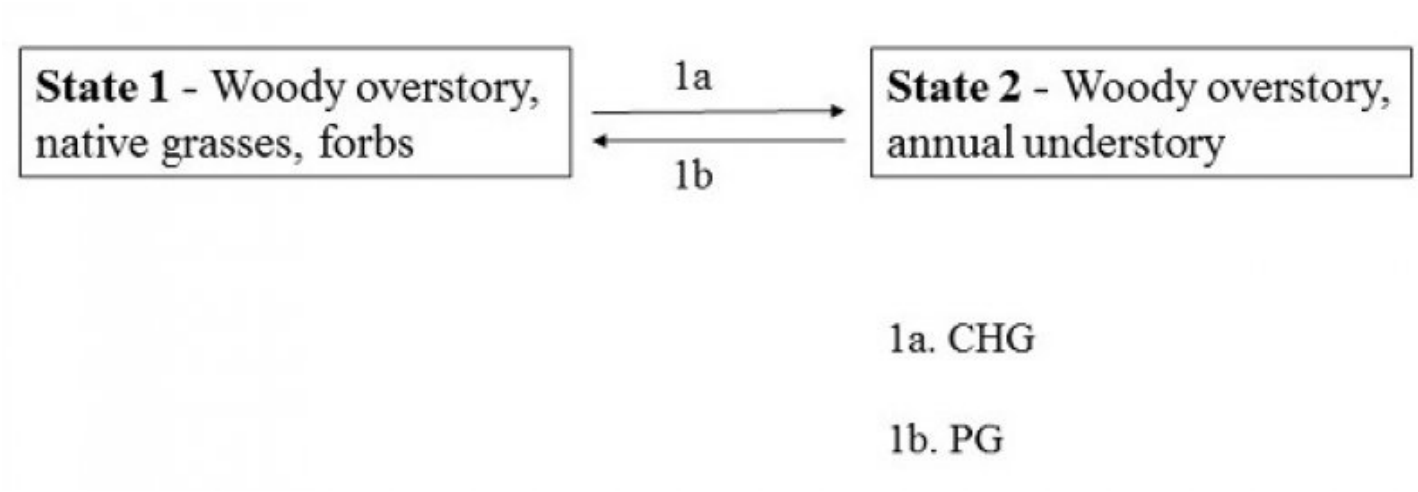

Figure 4. MLRA 38.1 (12-16"), Sandy Bottom

State 1
Historic Climax Plant Community

Community 1.1
Historic Climax Plant Community

The potential plant community is a mixture of trees, shrubs, and perennial grasses. Warm-season and cool-season grasses make up approximately equal percentages of the potential vegetation. As the site deteriorates from disturbance perennial grasses decline and shrubby species, such as juniper, oak, willows and groundsel, increase or invade to dominate the site, usually with a resultant increase in erosion.

Table 5. Annual production by plant type

Plant Type	Low (Lb/Acre)	Representative Value (Lb/Acre)	High (Lb/Acre)
Grass/Grasslike	480	840	1200
Tree	220	385	550
Shrub/Vine	80	140	200
Forb	48	84	120
Total	**828**	**1449**	**2070**

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 (Lb/Acre)	Foliar Cover (%)
Grass/Grasslike					
1	**Dominant Perennial Grasses**			170–500	
	sideoats grama	BOCU	*Bouteloua curtipendula*	70–140	–
	blue grama	BOGR2	*Bouteloua gracilis*	14–70	–
	bullgrass	MUEM	*Muhlenbergia emersleyi*	35–70	–
	deergrass	MURI2	*Muhlenbergia rigens*	35–70	–

	vine mesquite	PAOB	*Panicum obtusum*	14–70	–
	threeawn	ARIST	*Aristida*	14–70	–
	cane bluestem	BOBA3	*Bothriochloa barbinodis*	14–70	–
2	**Other perennial grasses**			420–600	
	western wheatgrass	PASM	*Pascopyrum smithii*	60–75	–
	squirreltail	ELELE	*Elymus elymoides ssp. elymoides*	60–75	–
	wildrye	ELYMU	*Elymus*	55–70	–
	New Mexico feathergrass	HENE5	*Hesperostipa neomexicana*	55–70	–
	muttongrass	POFE	*Poa fendleriana*	55–70	–
	spike dropseed	SPCO4	*Sporobolus contractus*	45–70	–
	sand dropseed	SPCR	*Sporobolus cryptandrus*	50–70	–
	giant dropseed	SPGI	*Sporobolus giganteus*	45–70	–
	plains bristlegrass	SEVU2	*Setaria vulpiseta*	50–60	–
3	**Minor perennial and annual grasses**			14–70	
	saltgrass	DISTI	*Distichlis*	3–18	–
	creeping muhly	MURE	*Muhlenbergia repens*	3–18	–
	tumblegrass	SCPA	*Schedonnardus paniculatus*	3–18	–
	Grass, annual	2GA	*Grass, annual*	2–16	–
Forb					
4	**Forbs**			28–140	
	Forb, annual	2FA	*Forb, annual*	14–70	–
	Forb, perennial	2FP	*Forb, perennial*	14–70	–
Shrub/Vine					
5	**Shrubs**			70–210	
	boxelder	ACNE2	*Acer negundo*	8–24	–
	netleaf hackberry	CELAR	*Celtis laevigata var. reticulata*	8–24	–
	skunkbush sumac	RHTR	*Rhus trilobata*	8–24	–
	plum	PRUNU	*Prunus*	8–24	–
	smooth sumac	RHGL	*Rhus glabra*	7–23	–
	currant	RIBES	*Ribes*	7–23	–
	grape	VITIS	*Vitis*	7–23	–
	bastardsage	ERWR	*Eriogonum wrightii*	7–23	–
	pale desert-thorn	LYPA	*Lycium pallidum*	7–23	–
Tree					
6	**Trees**			280–480	
	narrowleaf cottonwood	POAN3	*Populus angustifolia*	140–280	–
	Fremont cottonwood	POFR2	*Populus fremontii*	24–30	–
	Arizona sycamore	PLWR2	*Platanus wrightii*	20–30	–
	willow	SALIX	*Salix*	20–30	–
	Arizona walnut	JUMA	*Juglans major*	16–24	–
	Arizona white oak	QUAR	*Quercus arizonica*	16–24	–
	Emory oak	QUEM	*Quercus emoryi*	16–24	–
	Gambel oak	QUGA	*Quercus gambelii*	16–24	–

Animal community

The Sandy Bottom ecological site is often overused as it has a long, green season, is readily accessible, and has natural water available. Special management is needed to obtain proper use of these areas. Area responds well to Prescribed Grazing practices. The natural water and excellent forage diversity, cover, and long, green seasons make this site good habitat for a variety of species.

Recreational uses

The Sandy Bottom ecological site occurs as sandy benches along creeks and drainages, and the aspect is tree-dominated with grassland openings, and occasional rock outcrop, all of which make it a good recreational area. The summers are warm and the winters are cold. Activities include wildlife observation, photography, hiking, hunting, and horseback riding.

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:**

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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):**

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:

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17. **Perennial plant reproductive capability:**
