USDA Natural Resources
Conservation Service

Ecological site R038XA112AZ
Sandy Loam Upland, Deep 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.

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.

Associated sites

R038XA102AZ	**Clayey Upland 12-16" p.z.** Clayey Upland 12-16" p.z.
R038XA103AZ	**Clay Loam Upland 12-16" p.z.** Clay Loam Upland 12-16" p.z.

Table 1. Dominant plant species

Tree	Not specified
Shrub	(1) *Eriogonum wrightii*
Herbaceous	(1) *Bouteloua curtipendula*

Physiographic features

This site occurs at the lowest elevations of the interior chaparral zone in the Mogollon Transition area. It occurs in an upland position. It is on gentle slopes and fan terraces.

Table 2. Representative physiographic features

Landforms	(1) Terrace (2) Fan piedmont (3) Plain
Flooding frequency	None
Ponding frequency	None
Elevation	945–1,402 m

Slope	1–10%
Aspect	N, E, S

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

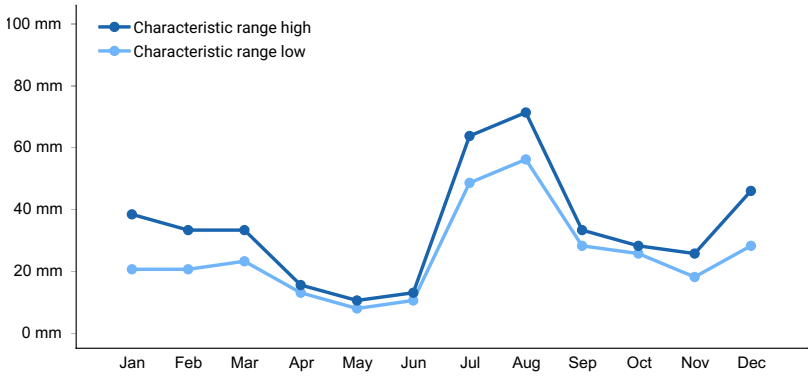


Figure 1. Monthly precipitation range

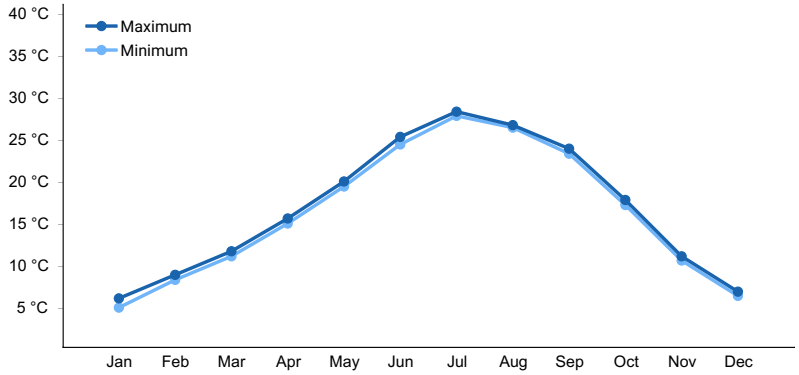


Figure 2. Monthly average minimum and maximum temperature

Influencing water features

There are no water features associated with this site.

Soil features

Typical taxonomic units where this site is mapped include: SSA-639 Black Hills-Sedona area MU's Perilla sandy loam-416, Perilla family loamy fine sand-430; SSA-661 Eastern Pinal and Southern Gila County area MU's Mallet-21, Combate-23, Combate-71; SSA-675 San Carlos IR area MU Combate-52.

Table 4. Representative soil features

Parent material	(1) Alluvium–granite
Surface texture	(1) Loam (2) Coarse sandy loam (3) Sandy loam
Family particle size	(1) Loamy
Drainage class	Well drained
Permeability class	Moderately rapid
Soil depth	152 cm
Surface fragment cover <=3"	5–30%
Surface fragment cover >3"	0%
Available water capacity (0-101.6cm)	9.65–17.78 cm
Calcium carbonate equivalent (0-101.6cm)	0%
Electrical conductivity (0-101.6cm)	0–2 mmhos/cm
Sodium adsorption ratio (0-101.6cm)	0
Soil reaction (1:1 water) (0-101.6cm)	6.1–7.8
Subsurface fragment volume <=3" (Depth not specified)	20–25%
Subsurface fragment volume >3" (Depth not specified)	0%

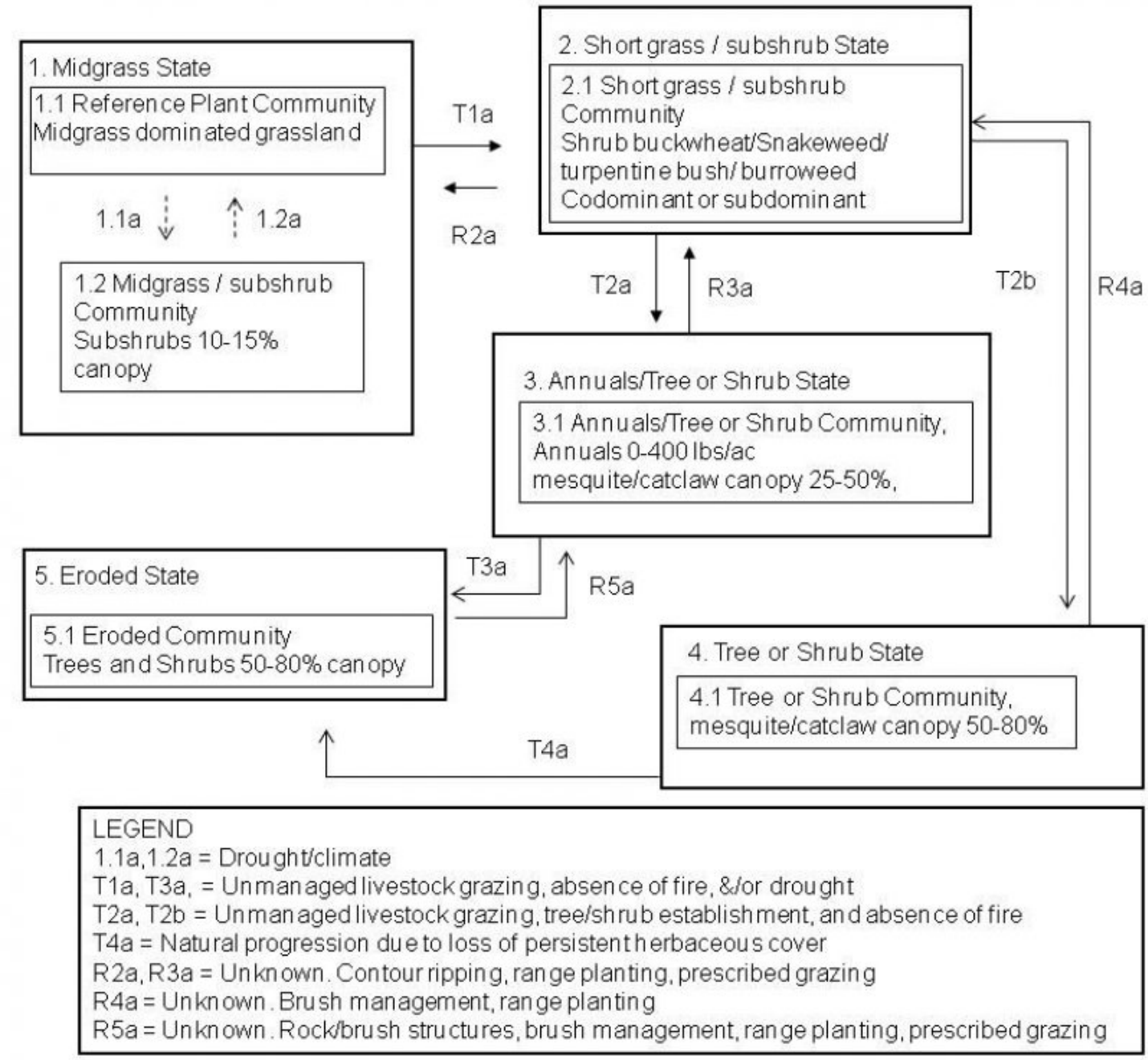
Ecological dynamics

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



State 1
Midgrass State

The Midgrass State is the Reference Plant Community (RPC). It is a warm season dominated grassland (canopy cover of 55 to 65%). Cool and warm season annual grasses and forbs are well represented in the flora. Half shrubs and perennial forbs are an important group also. The coefficient of variation (CV) is a useful measure to compare variability of data sets. Warm season grasslands are dependent on winter moisture to keep root systems hydrated and prevent desiccation. Summer moisture is critical for restoration and maintenance of root systems as well as above ground growth and seed or vegetative reproduction vital to the maintenance of the community. No clear pattern exists for CV values of historic winter rainfall from climate stations in the vicinity of grasslands in the 12-16” precipitation zone of Southeastern Arizona (Land Resource Unit (LRU) 41-3) and grasslands in the 12-16” precipitation zone in Central Arizona (LRU 38-1); both are equally variable. However, climate stations in the vicinity of grasslands in these 2 LRU’s show distinct separation of CV values of historic summer precipitation values; partially explained by southeast Arizona being in closer proximity to summer moisture originating out of the Gulf of Mexico. The CV of historic summer precipitation at Walnut Grove, Yavapai County is 82; the climate station located closest to the RPC inventory location. Coefficient of variation values of historic summer precipitation at Willow Springs, Winkelman, Superior (Pinal County), San Carlos Lake, and Roosevelt Lake (Gila County) are 79, 79, 82,

78, and 82, respectively. The soil moisture/temperature regime of the lower elevation sites of Winkelman, Superior, and Roosevelt Lake do not fit LRU 38-1 very well. However, they are very near the transition between 40-1 and 38-1 and illustrate near equal variability of summer precipitation of these regions. This is contrasted with locations like Willcox (Cochise County) and San Manuel (Pinal County) in LRU 41-3 that have historic summer precipitation CV values of 69-72. Despite grasslands in LRU 38-1 experiencing approximately 10% more variable average summer rainfall the existence of these grassland communities can be observed. A high density/producing grass community on a calcareous soil is found in the southeast portion of LRU 38-1 on the extreme northwest portion of Willow Springs Ranch near the boundary with the 96 Ranch at an elevation of 3500 feet; evidence that climate in the far southeast portion of LRU 38-1 has the potential to support perennial grassland communities as found at the RPC documented in the far northwest portion of the LRU. Perennial grasslands in LRU 38-1 are likely more susceptible to the stressors that induce transitions to alternative states given the greater variability of summer rainfall in this region; especially shrub dominated communities that are so prevalent in this MLRA.

Community 1.1
Reference Plant Community

The Midgrass State is the Reference Plant Community. It is a warm season dominated grassland (canopy cover of 40 to 50%). Sideoats grama is the dominant perennial grass. Blue grama is an important grass at the upper elevations of the site and is replaced by black and hairy grama at lower elevations. Cool and warm season annual grasses and forbs are well represented in the flora. Half shrubs and perennial forbs are an important group also. Snakeweed and shrubby buckwheat are the primary shrubs that can increase at upper elevations; turpentine bush and burroweed at mid and lower elevations. Periodic wildfires likely occurred every 15 to 20 years; June through August, and controlled shrubs and succulents invading from adjacent, shallow soil, areas. In the absence of fire for long periods of time shrubs, trees and cacti can dominate the site. The interactions of drought, fire and grazing can result in a loss of perennial grass cover. Annuals, both native and non-native, can dominate the plant community in these situations . Non-native annuals can, over time, diminish the soil seed-bank of native annual species.

Table 5. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Grass/Grasslike	560	897	1233
Forb	22	45	191
Shrub/Vine	45	67	90
Tree	2	6	11
Total	**629**	**1015**	**1525**

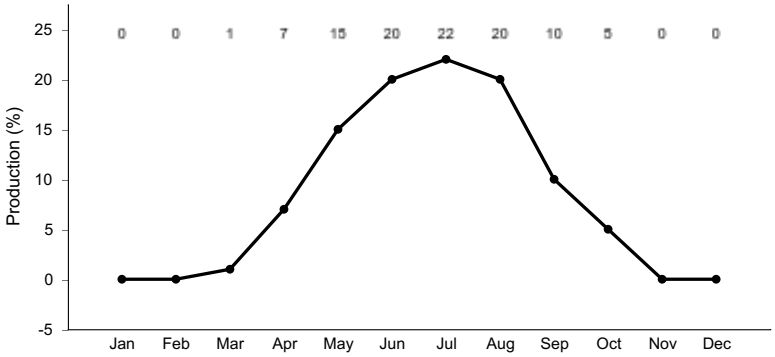


Figure 4. Plant community growth curve (percent production by month). AZ3811, 38.1 12-16" p.z. all sites. Growth begins in the spring, most growth occurs in the summer..

Community 1.2
Midgrass/ Sub Shrub Plant Community

State 2
Short grass / subshrub State

Subshrubs increase in abundance due to reduced abundance/vigor of perennial grasses.

Community 2.1
Short grass / subshrub Community

State 3
Annuals/Tree or Shrub State

Trees and shrubs have increased in the absence of periodic wildfire. Perennial grasses have been replaced by annual grasses and forbs.

Community 3.1
Annuals/Tree or Shrub Community,

Perennial grasses have been reduced from the interaction of continuous high intensity herbivory and drought. Annual grasses make up the herbaceous understory and are absent in drought years. Trees and shrubs have increased in the absence of periodic wildfire.

State 4
Tree or Shrub State

Trees or shrubs have increased to dominate the site.

Community 4.1
Tree or Shrub Community

Trees or shrubs have increased to 50-80% canopy cover. Subshrubs dominate lower canopy levels at such high amounts that herbaceous species are severely limited.

State 5
Eroded State

Herbaceous cover has been reduced for so long that soils begin to erode.

Community 5.1
Eroded Community

Trees, shrubs, and succulents dominate the plant community. Annual grasses and forbs are severely reduced due to very high levels of subshrubs that occupy most space among trees and succulents.

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**			359–740	
	sideoats grama	BOCU	*Bouteloua curtipendula*	336–616	–
	black grama	BOER4	*Bouteloua eriopoda*	22–67	–
	blue grama	BOGR2	*Bouteloua gracilis*	0–56	–
	hairy grama	BOHI2	*Bouteloua hirsuta*	0–56	–
2	**Cool season grasses**			0–11	

	squirreltail	ELEL5	*Elymus elymoides*	0–11	–
3	**Misc. perennial grasses**			6–202	
	purple threeawn	ARPU9	*Aristida purpurea*	6–84	–
	red grama	BOTR2	*Bouteloua trifida*	0–22	–
	spidergrass	ARTE3	*Aristida ternipes*	1–22	–
	spidergrass	ARTEG	*Aristida ternipes var. gentilis*	0–17	–
	bush muhly	MUPO2	*Muhlenbergia porteri*	0–17	–
	plains bristlegrass	SEVU2	*Setaria vulpiseta*	0–17	–
	Fendler threeawn	ARPUL	*Aristida purpurea var. longiseta*	0–11	–
	cane bluestem	BOBA3	*Bothriochloa barbinodis*	0–6	–
	curly-mesquite	HIBE	*Hilaria belangeri*	0–6	–
	green sprangletop	LEDU	*Leptochloa dubia*	0–6	–
	Arizona cottontop	DICA8	*Digitaria californica*	0–6	–
	sand dropseed	SPCR	*Sporobolus cryptandrus*	0–6	–
	fall witchgrass	DICO6	*Digitaria cognata*	0–2	–
	plains lovegrass	ERIN	*Eragrostis intermedia*	0–1	–
	tanglehead	HECO10	*Heteropogon contortus*	0–1	–
4	**Annual grasses**			0–202	
	sixweeks fescue	VUOC	*Vulpia octoflora*	1–56	–
	mucronate sprangeltop	LEPAB	*Leptochloa panicea ssp. brachiata*	0–28	–
	small fescue	VUMI	*Vulpia microstachys*	0–22	–
	sixweeks threeawn	ARAD	*Aristida adscensionis*	1–22	–
	Mexican panicgrass	PAHI5	*Panicum hirticaule*	0–17	–
	Arizona signalgrass	URAR	*Urochloa arizonica*	0–17	–
	Eastwood fescue	VUMIC	*Vulpia microstachys var. ciliata*	0–11	–
	Rothrock's grama	BORO2	*Bouteloua rothrockii*	0–11	–
	prairie threeawn	AROL	*Aristida oligantha*	0–6	–
	witchgrass	PACA6	*Panicum capillare*	0–6	–
	delicate muhly	MUFR	*Muhlenbergia fragilis*	0–2	–
	littleseed muhly	MUMI	*Muhlenbergia microsperma*	0–2	–
	Arizona brome	BRAR4	*Bromus arizonicus*	0–2	–
	feather fingergrass	CHVI4	*Chloris virgata*	0–2	–
	canyon cupgrass	ERLE7	*Eriochloa lemmonii*	0–1	–
	tufted lovegrass	ERPE	*Eragrostis pectinacea*	0–1	–
	Mexican sprangletop	LEFUU	*Leptochloa fusca ssp. uninervia*	0–1	–
	needle grama	BOAR	*Bouteloua aristidoides*	0–1	–
	sixweeks grama	BOBA2	*Bouteloua barbata*	0–1	–
	Bigelow's bluegrass	POBI	*Poa bigelovii*	0–1	–
Forb					
5	**Perennial forbs**			6–45	
	weakleaf bur ragweed	AMCO3	*Ambrosia confertiflora*	1–6	–
	desert globemallow	SPAM2	*Sphaeralcea ambigua*	1–6	–
	brownplume wirelettuce	STPA4	*Stephanomeria pauciflora*	1–6	–
	Coues' cassia	SECO10	*Senna covesii*	0–2	–

	lacy tansyaster	MAPI	*Machaeranthera pinnatifida*	0–2	–
	perennial rockcress	ARPE2	*Arabis perennans*	1–2	–
	desert marigold	BAMU	*Baileya multiradiata*	0–1	–
	scarlet spiderling	BOCO	*Boerhavia coccinea*	0–1	–
	desert mariposa lily	CAKE	*Calochortus kennedyi*	0–1	–
	sego lily	CANU3	*Calochortus nuttallii*	0–1	–
	leatherweed	CRPO5	*Croton pottsii*	0–1	–
	Gregg's prairie clover	DAGR2	*Dalea greggii*	0–1	–
	Cooley's bundleflower	DECO2	*Desmanthus cooleyi*	0–1	–
	fleabane	ERIGE2	*Erigeron*	0–1	–
	wild dwarf morning-glory	EVAR	*Evolvulus arizonicus*	0–1	–
	southwestern mock vervain	GLGO	*Glandularia gooddingii*	0–1	–
	Indian rushpea	HOGL2	*Hoffmannseggia glauca*	0–1	–
	Wright's deervetch	LOWR	*Lotus wrightii*	0–1	–
	dwarf desertpeony	ACNA2	*Acourtia nana*	0–1	–
	brownfoot	ACWR5	*Acourtia wrightii*	0–1	–
	trailing windmills	ALIN	*Allionia incarnata*	0–1	–
	orange fameflower	PHAU13	*Phemeranthus aurantiacus*	0–1	–
	slender poreleaf	POGR5	*Porophyllum gracile*	0–1	–
	canaigre dock	RUHY	*Rumex hymenosepalus*	0–1	–
	twinleaf senna	SEBA3	*Senna bauhinioides*	0–1	–
	New Mexico fanpetals	SINE	*Sida neomexicana*	0–1	–
	silverleaf nightshade	SOEL	*Solanum elaeagnifolium*	0–1	–
	white sagebrush	ARLUM2	*Artemisia ludoviciana ssp. mexicana*	0–1	–
	branched noseburn	TRRA5	*Tragia ramosa*	0–1	–
	Louisiana vetch	VILU	*Vicia ludoviciana*	0–1	–
6	**Annual Forbs**			0–146	
	California poppy	ESCAM	*Eschscholzia californica ssp. mexicana*	0–28	–
	bristly fiddleneck	AMTE3	*Amsinckia tessellata*	0–22	–
	Coulter's spiderling	BOCO2	*Boerhavia coulteri*	0–17	–
	desert Indianwheat	PLOV	*Plantago ovata*	0–17	–
	Arizona poppy	KAGR	*Kallstroemia grandiflora*	0–11	–
	Arizona popcornflower	PLAR	*Plagiobothrys arizonicus*	0–11	–
	western tansymustard	DEPI	*Descurainia pinnata*	0–11	–
	milkvetch	ASTRA	*Astragalus*	0–6	–
	Coulter's lupine	LUSP2	*Lupinus sparsiflorus*	0–6	–
	slender goldenweed	MAGR10	*Machaeranthera gracilis*	0–6	–
	tanseyleaf tansyaster	MATA2	*Machaeranthera tanacetifolia*	0–6	–
	phacelia	PHACE	*Phacelia*	0–6	–
	whitestem blazingstar	MEAL6	*Mentzelia albicaulis*	0–1	–
	green carpetweed	MOVE	*Mollugo verticillata*	0–1	–
	combseed	PECTO	*Pectocarya*	0–1	–
	manybristle chinchweed	PERA3	*Pectis papposa*	0–1	

	manybristle chinchweed	PEPA2	*Pectis papposa*	0–1	–
	creamcups	PLCA5	*Platystemon californicus*	0–1	–
	sorrel buckwheat	ERPO4	*Eriogonum polycladon*	0–1	–
	Texas stork's bill	ERTE13	*Erodium texanum*	0–1	–
	Gordon's bladderpod	LEGO	*Lesquerella gordonii*	0–1	–
	shaggyfruit pepperweed	LELA	*Lepidium lasiocarpum*	0–1	–
	coastal bird's-foot trefoil	LOSA	*Lotus salsuginosus*	0–1	–
	Arizona lupine	LUAR4	*Lupinus arizonicus*	0–1	–
	miniature lupine	LUBI	*Lupinus bicolor*	0–1	–
	spurge	EUPHO	*Euphorbia*	0–1	–
	star gilia	GIST	*Gilia stellata*	0–1	–
	longleaf false goldeneye	HELOA2	*Heliomeris longifolia var. annua*	0–1	–
	crestrib morning-glory	IPCO2	*Ipomoea costellata*	0–1	–
	redstar	IPCO3	*Ipomoea coccinea*	0–1	–
	purslane	PORTU	*Portulaca*	0–1	–
	spreading fanpetals	SIAB	*Sida abutifolia*	0–1	–
	sleepy silene	SIAN2	*Silene antirrhina*	0–1	–
	thelypody	THELY	*Thelypodium*	0–1	–
	woolly tidestromia	TILA2	*Tidestromia lanuginosa*	0–1	–
	wedgeleaf draba	DRCU	*Draba cuneifolia*	0–1	–
	flatcrown buckwheat	ERDE6	*Eriogonum deflexum*	0–1	–
	miniature woollystar	ERDI2	*Eriastrum diffusum*	0–1	–
	spreading fleabane	ERDI4	*Erigeron divergens*	0–1	–
	carelessweed	AMPA	*Amaranthus palmeri*	0–1	–
	hoary bowlesia	BOIN3	*Bowlesia incana*	0–1	–
	pitseed goosefoot	CHBE4	*Chenopodium berlandieri*	0–1	–
	Esteve's pincushion	CHST	*Chaenactis stevioides*	0–1	–
	New Mexico thistle	CINE	*Cirsium neomexicanum*	0–1	–
	scrambled eggs	COAU2	*Corydalis aurea*	0–1	–
	cryptantha	CRYPT	*Cryptantha*	0–1	–
	American wild carrot	DAPU3	*Daucus pusillus*	0–1	–
	sacred thorn-apple	DAWR2	*Datura wrightii*	0–1	–
Shrub/Vine					
7	**Evergreen shrubs**			0–17	
	Sonoran scrub oak	QUTU2	*Quercus turbinella*	0–6	–
	jojoba	SICH	*Simmondsia chinensis*	0–6	–
	redberry buckthorn	RHCR	*Rhamnus crocea*	0–1	–
	longleaf jointfir	EPTR	*Ephedra trifurca*	0–1	–
	red barberry	MAHA4	*Mahonia haematocarpa*	0–1	–
	algerita	MATR3	*Mahonia trifoliolata*	0–1	–
8	**Miscellaneous large shrubs**			0–11	
	catclaw acacia	ACGR	*Acacia greggii*	0–6	–
	whitethorn acacia	ACCO2	*Acacia constricta*	0–2	–
	water jacket	LYAN	*Lycium andersonii*	0–1	–

	Berlandier's wolfberry	LYBE	*Lycium berlandieri*	0–1	–
	catclaw mimosa	MIACB	*Mimosa aculeaticarpa var. biuncifera*	0–1	–
	blue paloverde	PAFL6	*Parkinsonia florida*	0–1	–
	yellow paloverde	PAMI5	*Parkinsonia microphylla*	0–1	–
	skunkbush sumac	RHTR	*Rhus trilobata*	0–1	–
	lotebush	ZIOBC	*Ziziphus obtusifolia var. canescens*	0–1	–
9	**Dominant half shrubs**			11–56	
	bastardsage	ERWR	*Eriogonum wrightii*	11–56	–
	fairyduster	CAER	*Calliandra eriophylla*	0–11	–
	littleleaf ratany	KRER	*Krameria erecta*	0–1	–
	rough menodora	MESC	*Menodora scabra*	0–1	–
	desert zinnia	ZIAC	*Zinnia acerosa*	0–1	–
10	**Succulents**			0–6	
	buck-horn cholla	CYAC8	*Cylindropuntia acanthocarpa*	0–1	–
	jumping cholla	CYFU10	*Cylindropuntia fulgida*	0–1	–
	Christmas cactus	CYLE8	*Cylindropuntia leptocaulis*	0–1	–
	walkingstick cactus	CYSP8	*Cylindropuntia spinosior*	0–1	–
	common sotol	DAWH2	*Dasylirion wheeleri*	0–1	–
	pinkflower hedgehog cactus	ECBO2	*Echinocereus bonkerae*	0–1	–
	Engelmann's hedgehog cactus	ECEN	*Echinocereus engelmannii*	0–1	–
	redspine fishhook cactus	ECER2	*Echinomastus erectocentrus*	0–1	–
	pinkflower hedgehog cactus	ECFA	*Echinocereus fasciculatus*	0–1	–
	candy barrelcactus	FEWI	*Ferocactus wislizeni*	0–1	–
	Graham's nipple cactus	MAGR9	*Mammillaria grahamii*	0–1	–
	sacahuista	NOMI	*Nolina microcarpa*	0–1	–
	cactus apple	OPEN3	*Opuntia engelmannii*	0–1	–
	purple pricklypear	OPMA8	*Opuntia macrocentra*	0–1	–
	tulip pricklypear	OPPH	*Opuntia phaeacantha*	0–1	–
	banana yucca	YUBA	*Yucca baccata*	0–1	–
	soaptree yucca	YUEL	*Yucca elata*	0–1	–
11	**Increaser half-shrubs**			1–6	
	broom snakeweed	GUSA2	*Gutierrezia sarothrae*	1–6	–
	burroweed	ISTE2	*Isocoma tenuisecta*	0–1	–
	yerba de pasmo	BAPT	*Baccharis pteronioides*	0–1	–
	button brittlebush	ENFR	*Encelia frutescens*	0–1	–
	turpentine bush	ERLA12	*Ericameria laricifolia*	0–1	–
	threadleaf snakeweed	GUMI	*Gutierrezia microcephala*	0–1	–
Tree					
12	**Trees**			1–6	
	velvet mesquite	PRVE	*Prosopis velutina*	0–6	–
	redberry juniper	JUCO11	*Juniperus coahuilensis*	0–1	–

	redberry juniper	JUCO11	*Juniperus coahuilensis*	0–1	–
	oneseed juniper	JUMO	*Juniperus monosperma*	0–1	–
	Utah juniper	JUOS	*Juniperus osteosperma*	0–1	–

Animal community

This site is suitable for grazing year round, and is easily traversed by livestock. Livestock grazing use is concentrated near trails, roads and waters. The site is susceptible to erosion in overgrazed areas like bed-grounds, livestock trails and slopes adjacent to water.
The site has good habitat diversity for a variety of desert wildlife species. It is home mainly to small mammals and birds and their associated predators. It is a foraging area for deer and antelope. Water developments are very important to both livestock and wildlife on this site.

Hydrological functions

Hydrologic relationships are very good. Coarse textured soils, high plant and litter cover and low bulk densities result in very little runoff in most years.

Recreational uses

Hunting, hiking, horseback riding, camping, bird watching, photography.

Wood products

Where mesquite has increased and grown to tree size, it provides both fuel-wood and posts.

Type locality

Location 1: Yavapai County, AZ	
UTM zone	N
UTM northing	3806611
UTM easting	348864
General legal description	Just north of Highway 89 and approximately 4 miles West of Wilhoit, AZ.

Contributors

Larry D. Ellicott
Steve Barker

Approval

Scott Woodall, 5/07/2020

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)	Dave Womack, Bob Adams.
Contact for lead author	USDA NRCS, Tucson, AZ Area Office.

Date	11/18/2010
Approved by	Scott Woodall
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

Indicators

1. **Number and extent of rills:** None present on the site.

2. **Presence of water flow patterns:** Water flow patterns are difficult to discern. Soils are coarse textured and provide for very high rates of infiltration. In addition, there are approximately 3-5 perennial grass plants per square yard which provide very high sinuosity to any precipitation that exceeds intake rate of soil.

3. **Number and height of erosional pedestals or terracettes:** None present on the site.

4. **Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):** 10-20%

5. **Number of gullies and erosion associated with gullies:** None present on the site.

6. **Extent of wind scoured, blowouts and/or depositional areas:** None present on the site.

7. **Amount of litter movement (describe size and distance expected to travel):** Herbaceous litter is rarely transported from the site due to high intake rates of most soils. Intake rates for most soils are from 2-6 inches per hour.

8. **Soil surface (top few mm) resistance to erosion (stability values are averages - most sites will show a range of values):** Expect values of 5-6 across most of the site. With prolonged extreme drought stability of bare ground areas are expected to decrease due to absence of annual herbaceous litter and its contribution to organic matter of the soil surface.

9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** Weak thir platy parting weak fine and medium granular structure; 1-2% organic matter content; Dry colors range from 7.5YR 5/3 to 10YR 4/2 dry and moist colors range from 7.5YR 3/3 to 10YR 2/2.

10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:** Plant community is dominated by perennial bunch grasses that in addition to coarse textured soils promotes very high levels of infiltration and runoff only with very high intensity summer thunderstorms.

11. **Presence and thickness of compaction layer (usually none; describe soil profile features which may be mistaken for compaction on this site):** Not present on the site. Bw horizon very rarely has enough density to be mistaken for a compaction layer.

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: Midgrass

    Sub-dominant: short grasses

    Other: perennial forbs approx = sub shrubs > shrubs approx = trees = cacti = increaser half shrubs

    Additional: Above average winter and spring precipitation can result in annual grasses and forbs having greater production than short grasses

13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):** Very little mortality of most plants. Perennial grasses have less than 5% mortality.

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):** 550 lbs/ac dry years; 900 lbs/ac average year; 1350 lbs/ac wet years.

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:** Red brome, mesquite, catclaw acacia, turpentine bush, snakeweed, burroweed, and cacti.

17. **Perennial plant reproductive capability:** All plants native to this site are adapted to the climate and are capable of producing seeds and stolons in most years except the most severe droughts.