USDA Natural Resources
Conservation Service

Ecological site R038XA113AZ
Sandy Loam Upland 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.

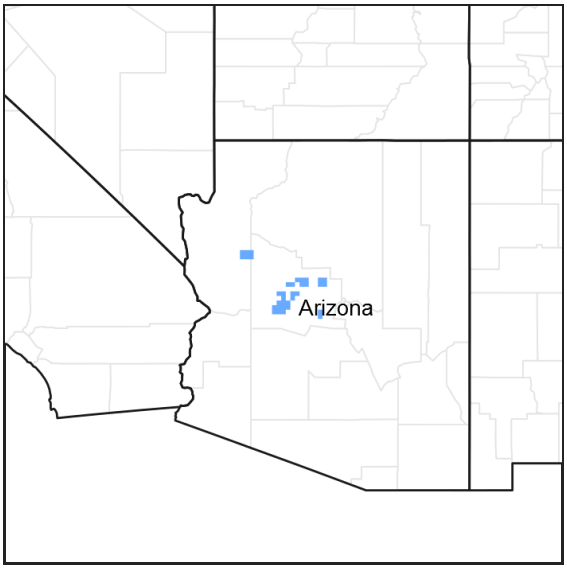


Figure 1. Mapped extent

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 Loam Upland ecological site occurs on upland positions. It is on gentle slopes, fan terraces, ridgetops, and mesa tops. They have formed in alluvium and colluvium from a variety of parent materials. Soil surfaces can be covered by gravels, cobbles, and/or stones.

Associated sites

R038XA106AZ	**Limy Upland 12-16" p.z.**
R038XA108AZ	**Clayey Slopes 12-16" p.z.**
R038XA126AZ	**Limy Slopes 12-16" p.z.**

Similar sites

R040XA120AZ	**Clay Loam Upland 10"-13" p.z.**
R041XC305AZ	**Clay Loam Upland 12-16" p.z.**
R041XB204AZ	**Clay Loam Upland 8-12" p.z.**
R038XB203AZ	**Clay Loam Upland 16-20" p.z.**

Table 1. Dominant plant species

Tree	Not specified
Shrub	(1) *Eriogonum wrightii* (2) *yucca elata*
Herbaceous	(1) *bouteloua eriopoda* (2) *muhlenbergia porteri*

Physiographic features

The Sandy Loam Upland ecological site occurs at the lowest elevations of the interior chaparral zone in the Mogollon Transition area. It occurs on upland positions. It is on gentle slopes, fan terraces, ridgetops, and mesa tops.

Table 2. Representative physiographic features

Landforms	(1) Fan piedmont (2) Mesa (3) Lava flow
Flooding frequency	None
Elevation	914–1,372 m
Slope	15–45%
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 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

There are no water features associated with the Sandy Loam Upland ecological site.

Soil features

These soils are moderately deep to deep (30 to 60 inches), and dark colored in the surface (6 to 12 inches). They are clayey textured, gravelly to very gravelly, and well drained. They have formed in alluvium and colluvium from a variety of parent materials. They do not exhibit vertic soil properties (cracking and churning). Soil surfaces can be covered by gravels, cobbles, and/or stones. The erosion hazard is moderate to high where plant or gravel covers are inadequate.
Typical taxonomic units where this site is mapped include: SSA-627 Mohave County Southern part MU Carri family-137; SSA-637 Yavapai County Western part MU Balon-BdC; SSA-639 Black Hills-Sedona area MU's Altar-415, Gyberg-432, Altar family-433 and 437; SSA-697 Mohave County Central part MU's Carri family-158, Manikan-81.

Table 4. Representative soil features

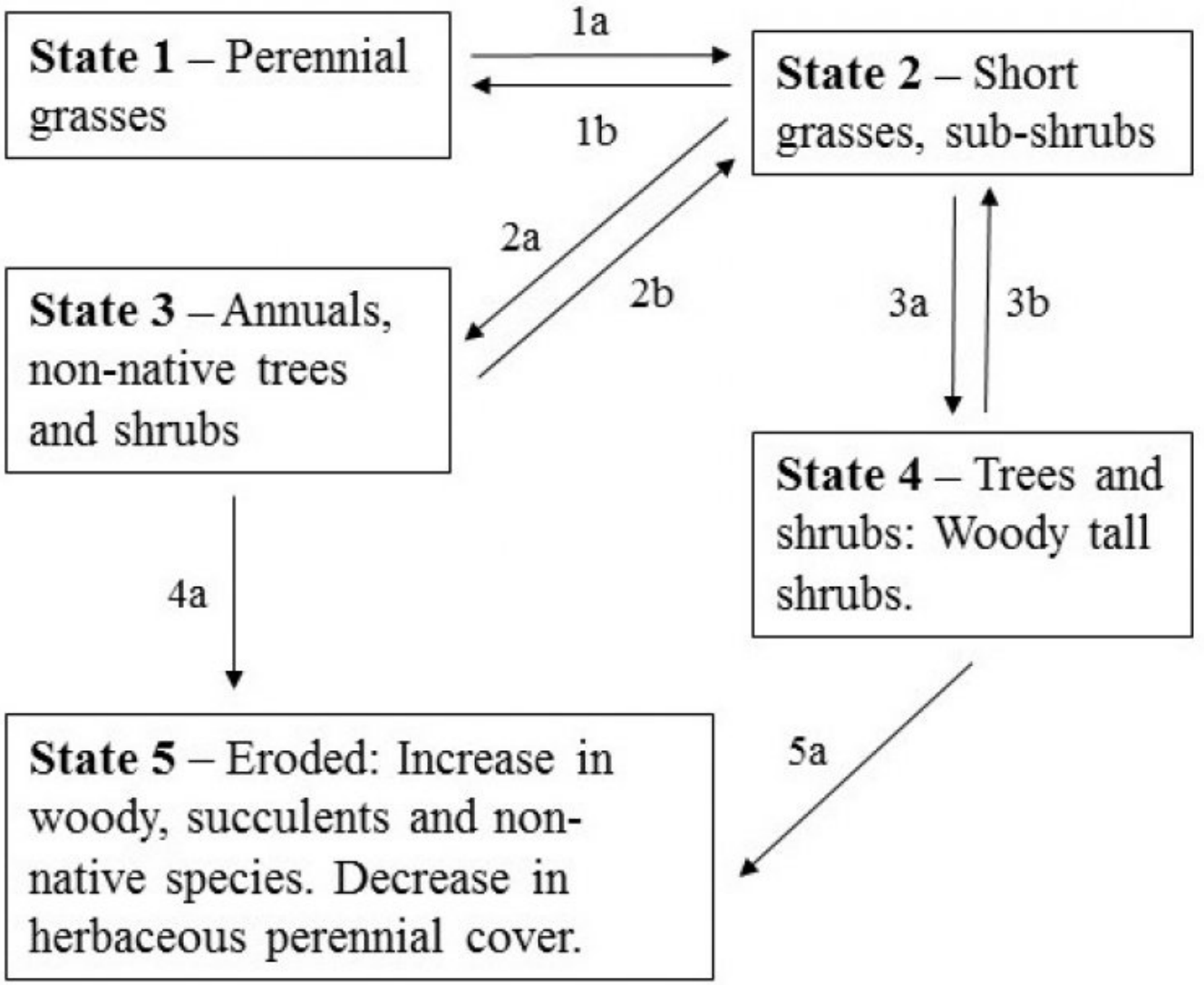
Surface texture	(1) Gravelly clay loam (2) Very gravelly loam (3) Very gravelly clay loam
Family particle size	(1) Clayey
Drainage class	Well drained
Permeability class	Moderately slow to slow
Soil depth	76–152 cm
Surface fragment cover <=3"	15–60%
Surface fragment cover >3"	1–10%
Available water capacity (0-101.6cm)	7.62–19.05 cm
Calcium carbonate equivalent (0-101.6cm)	1–15%
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)	7–8.2
Subsurface fragment volume <=3" (Depth not specified)	5–55%
Subsurface fragment volume >3" (Depth not specified)	0–10%

Ecological dynamics

The historic native plant community is dominated by tobosa and other perennial warm-season grasses with a mixture of desert shrubs, half shrubs, succulents, and forbs. This includes a diverse flora of native annual grasses and forbs of both the winter and summer seasons. Periodic wildfires occurred at moderate intervals (15 to 30 years) and helped to maintain a balance between grasses and shrubs. The interactions of drought, fire, and continuous livestock grazing can, over time, result in the loss of perennial grasses, half shrubs, and suffrutescent forbs on this site. The lack of fire for very long periods can lead to increases in large shrubs/succulents like prickly pear, and

whitethorn acacia. Trees like juniper, paloverde, mesquite, and canotia can increase as well. In some situations non-native annuals can dominate the site. These species can, over time, diminish the soil seed-bank of native annual species. Non-native annuals can act to increase the fire frequency of areas of the site near roads and urban areas, where the incidence of man-made fires is high.

State and transition model



1a. Fire, drought, CHG

2a. CHG, absence of fire

3a. Woody species increase due to absence of fire and CHG

4a. Accelerated soil erosion may occur where herbaceous plants are absent.

5a. Fire, drought, CHG. Loss of perennial herbaceous cover.

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

State 1
Reference State

Community 1.1
Historic Native Plant Community

The historic native plant community is dominated by tobosa and other warm season perennial grasses with a mixture of desert shrubs, half-shrubs, suffrutescent forbs and succulents. A rich flora of native annual forbs and grasses, of both the winter and summer seasons, exist in the plant community. Natural fires, which burned at moderate intervals in this region, helped to maintain a balance between perennial grasses and shrubs.

Table 5. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Grass/Grasslike	404	841	1233
Forb	8	56	269
Shrub/Vine	28	112	224
Tree	–	6	17
Total	**440**	**1015**	**1743**

Table 6. Soil surface cover

Tree basal cover	0%
Shrub/vine/liana basal cover	1-2%
Grass/grasslike basal cover	6-12%
Forb basal cover	0-1%
Non-vascular plants	0%
Biological crusts	1-10%
Litter	10-60%
Surface fragments >0.25" and <=3"	15-60%
Surface fragments >3"	0-15%
Bedrock	0%
Water	0%
Bare ground	10-60%

Table 7. Canopy structure (% cover)

Height Above Ground (M)	Tree	Shrub/Vine	Grass/ Grasslike	Forb
<0.15	–	0-5%	1-10%	0-10%
>0.15 <= 0.3	–	0-2%	5-10%	1-10%
>0.3 <= 0.6	–	0-2%	10-20%	0-5%
>0.6 <= 1.4	–	0-5%	0-5%	0-1%
>1.4 <= 4	0-1%	0-1%	–	–
>4 <= 12	0-1%	–	–	–
>12 <= 24	–	–	–	–
>24 <= 37	–	–	–	–
>37	–	–	–	–

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

State 2
Short Grass State

Community 2.1
Short Grass Plant Community

Tobosa is removed from the plant community over time due to the interactions of fire, continuous grazing and drought. When the canopy cover of tobosa drops below 5% and the distribution of that cover is poor (clumped) then tobosa will not be able to recover on the site. Short grasses; especially curly mesquite and including slender and hairy grama will dominate the herbaceous layer of the plant community. These species fluctuate widely from drought to wet years.

State 3
Exotic Annual Invaded State

Community 3.1
Exotic Annual Plant Community

Non-native annual grasses like red brome, wild oats, mediterranean grass (schismus) and cheatgrass can invade and dominate areas of the site. These species can, over time, reduce the seed-bank of native annual grasses and forbs. Their presence can increase the fire frequency (of man made fires) especially where roads and urban areas are adjacent to areas of the site. Repeated fires tend to remove the native shrub, grass and forb canopy.

State 4
Shrub State

Community 4.1
Shrub Dominated Plant Community

In the absence of fire for long periods of time and with continuous grazing, shrubs like mesquite, paloverde and whitethorn acacia and succulents like prickly pear and banana yucca can increase to dominate the plant community. Trees including oneseed and redberry juniper and canotia can increase also. Perennial grasses and forbs cannot recover in the face of increased shrub competition.

State 5
Eroded State

Community 5.1
Eroded State

Shrubs like mesquite, palo verde and whitethorn acacia; trees like juniper and canotia; and succulents like prickly pear and banana yucca can increase to dominate the site. Non-native annual forbs and grasses dominate the under-story. In "El Nino" years herbaceous fuels are sufficient for burning and repeat fires are especially common in areas close to residential zones and roads. Extreme rainfall events coupled with the fire, drought and grazing interaction, can lead to rilling of steep slopes. Compaction of soils can occur with heavy trailing from continuous livestock use. Loss of plant cover after repeated fire can lead to accelerated sheet and rill erosion under these circumstances.

Additional community tables

Table 8. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Kg/Hectare)	Foliar Cover (%)
Grass/Grasslike					
1	**Dominant perennial grasses**			336–673	
	tobosagrass	PLMU3	*Pleuraphis mutica*	280–560	–
	sideoats grama	BOCU	*Bouteloua curtipendula*	56–112	–
2	**Cool season grasses**			1–56	
	squirreltail	ELEL5	*Elymus elymoides*	1–56	–
3	**Misc. perennial grasses**			56–280	
	curly-mesquite	HIBE	*Hilaria belangeri*	39–168	–
	black grama	BOER4	*Bouteloua eriopoda*	6–56	–
	hairy grama	BOHI2	*Bouteloua hirsuta*	0–56	–
	slender grama	BORE2	*Bouteloua repens*	0–56	–
	purple threeawn	ARPU9	*Aristida purpurea*	6–56	–
	Parish's threeawn	ARPUP5	*Aristida purpurea var. parishii*	1–56	–
	spidergrass	ARTE3	*Aristida ternipes*	1–56	–
	red grama	BOTR2	*Bouteloua trifida*	0–22	–
	blue grama	BOGR2	*Bouteloua gracilis*	0–17	–
	spidergrass	ARTEG	*Aristida ternipes var. gentilis*	0–17	–
	bush muhly	MUPO2	*Muhlenbergia porteri*	0–17	–
	Hall's panicgrass	PAHA	*Panicum hallii*	0–17	–
	vine mesquite	PAOB	*Panicum obtusum*	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	–
	green sprangletop	LEDU	*Leptochloa dubia*	0–6	–
	Arizona cottontop	DICA8	*Digitaria californica*	0–6	–
	sand dropseed	SPCR	*Sporobolus cryptandrus*	0–6	–
	slim tridens	TRMU	*Tridens muticus*	0–2	–
	fall witchgrass	DICO6	*Digitaria cognata*	0–2	–
	plains lovegrass	ERIN	*Eragrostis intermedia*	0–1	–

	tanglehead	HECO10	*Heteropogon contortus*	0–1	–
4	**Annual grasses**			6–224	
	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	–
	Arizona signalgrass	URAR	*Urochloa arizonica*	0–17	–
	Mexican panicgrass	PAHI5	*Panicum hirticaule*	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	–
	desert lovegrass	ERPEM	*Eragrostis pectinacea var. miserrima*	0–1	–
	little barley	HOPU	*Hordeum pusillum*	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	
	largeflower onion	ALMA4	*Allium macropetalum*	0–6	–
	weakleaf bur ragweed	AMCO3	*Ambrosia confertiflora*	1–6	–
	bluedicks	DICA14	*Dichelostemma capitatum*	1–6	–
	slender janusia	JAGR	*Janusia gracilis*	0–6	–
	desert globemallow	SPAM2	*Sphaeralcea ambigua*	1–6	–
	brownplume wirelettuce	STPA4	*Stephanomeria pauciflora*	1–6	–
	perennial rockcress	ARPE2	*Arabis perennans*	1–2	–
	wishbone-bush	MILAV	*Mirabilis laevis var. villosa*	0–2	–
	Gila manroot	MAGI	*Marah gilensis*	0–2	–
	lacy tansyaster	MAPI	*Machaeranthera pinnatifida*	0–2	–
	Coues' cassia	SECO10	*Senna covesii*	0–2	–
	tuber anemone	ANTU	*Anemone tuberosa*	0–2	–
	narrowleaf silverbush	ARLA12	*Argythamnia lanceolata*	0–1	–
	white sagebrush	ARLUM2	*Artemisia ludoviciana ssp. mexicana*	0–1	–
	New Mexico silverbush	ARNE2	*Argythamnia neomexicana*	0–1	–
	dwarf desertpeony	ACNA2	*Acourtia nana*	0–1	–

	browntoot	ACWR5	*Acourtia wrightii*	0–1	–
	San Felipe dogweed	ADPO	*Adenophyllum porophylloides*	0–1	–
	trailing windmills	ALIN	*Allionia incarnata*	0–1	–
	Lemmon's ragwort	SELE8	*Senecio lemmonii*	0–1	–
	New Mexico fanpetals	SINE	*Sida neomexicana*	0–1	–
	silverleaf nightshade	SOEL	*Solanum elaeagnifolium*	0–1	–
	plains blackfoot	MELE2	*Melampodium leucanthum*	0–1	–
	desert tobacco	NIOB	*Nicotiana obtusifolia*	0–1	–
	New Mexico groundsel	PANE7	*Packera neomexicana*	0–1	–
	Oak Creek ragwort	PAQU8	*Packera quercetorum*	0–1	–
	toadflax penstemon	PELI2	*Penstemon linarioides*	0–1	–
	Parry's beardtongue	PEPA24	*Penstemon parryi*	0–1	–
	desert penstemon	PEPS	*Penstemon pseudospectabilis*	0–1	–
	orange fameflower	PHAU13	*Phemeranthus aurantiacus*	0–1	–
	slender poreleaf	POGR5	*Porophyllum gracile*	0–1	–
	glandleaf milkwort	POMA7	*Polygala macradenia*	0–1	–
	canaigre dock	RUHY	*Rumex hymenosepalus*	0–1	–
	twinleaf senna	SEBA3	*Senna bauhinioides*	0–1	–
	dense ayenia	AYMI	*Ayenia microphylla*	0–1	–
	desert marigold	BAMU	*Baileya multiradiata*	0–1	–
	scarlet spiderling	BOCO	*Boerhavia coccinea*	0–1	–
	climbing wartclub	BOSC	*Boerhavia scandens*	0–1	–
	wavyleaf Indian paintbrush	CAAPM	*Castilleja applegatei ssp. martinii*	0–1	–
	Arizona wrightwort	CAAR7	*Carlowrightia arizonica*	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	–
	desert larkspur	DEPA	*Delphinium parishii*	0–1	–
	tall mountain larkspur	DESC	*Delphinium scaposum*	0–1	–
	ragged nettlespurge	JAMA	*Jatropha macrorhiza*	0–1	–
	longflower tube tongue	JULO3	*Justicia longii*	0–1	–
	Wright's deervetch	LOWR	*Lotus wrightii*	0–1	–
	fleabane	ERIGE2	*Erigeron*	0–1	–
	desert trumpet	ERIN4	*Eriogonum inflatum*	0–1	–
	Mojave spurge	EUSC6	*Euphorbia schizoloba*	0–1	–
	southwestern mock vervain	GLGO	*Glandularia gooddingii*	0–1	–
	desert rosemallow	HICO	*Hibiscus coulteri*	0–1	–
	Indian rushpea	HOGL2	*Hoffmannseggia glauca*	0–1	–
	branched noseburn	TRRA5	*Tragia ramosa*	0–1	–
	Louisiana vetch	VILUL2	*Vicia ludoviciana ssp. ludoviciana*	0–1	–
6	**Annual forbs**			2–224	
	Arizona popcornflower	PLAR	*Plagiobothrys arizonicus*	0–56	–

	bristly fiddleneck	AMTE3	*Amsinckia tessellata*	0–56	–
	longleaf false goldeneye	HELOA2	*Heliomeris longifolia var. annua*	1–28	–
	California poppy	ESCAM	*Eschscholzia californica ssp. mexicana*	0–28	–
	Coulter's spiderling	BOCO2	*Boerhavia coulteri*	0–17	–
	desert Indianwheat	PLOV	*Plantago ovata*	0–17	–
	Gordon's bladderpod	LEGO	*Lesquerella gordonii*	0–17	–
	coastal bird's-foot trefoil	LOSA	*Lotus salsuginosus*	0–17	–
	Coulter's lupine	LUSP2	*Lupinus sparsiflorus*	0–17	–
	thelypody	THELY	*Thelypodium*	0–11	–
	exserted Indian paintbrush	CAEXE	*Castilleja exserta ssp. exserta*	0–11	–
	carelessweed	AMPA	*Amaranthus palmeri*	0–11	–
	Arizona poppy	KAGR	*Kallstroemia grandiflora*	0–11	–
	western tansymustard	DEPI	*Descurainia pinnata*	0–11	–
	miniature woollystar	ERDI2	*Eriastrum diffusum*	0–11	–
	milkvetch	ASTRA	*Astragalus*	0–6	–
	fivewing spiderling	BOIN	*Boerhavia intermedia*	0–6	–
	pitseed goosefoot	CHBE4	*Chenopodium berlandieri*	0–6	–
	woolly tidestromia	TILA2	*Tidestromia lanuginosa*	0–6	–
	phacelia	PHACE	*Phacelia*	0–6	–
	woolly plantain	PLPA2	*Plantago patagonica*	0–6	–
	New Mexico plumeseed	RANE	*Rafinesquia neomexicana*	0–6	–
	shaggyfruit pepperweed	LELA	*Lepidium lasiocarpum*	0–6	–
	foothill deervetch	LOHU2	*Lotus humistratus*	0–6	–
	desertparsley	LOMAT	*Lomatium*	0–6	–
	slender goldenweed	MAGR10	*Machaeranthera gracilis*	0–6	–
	tanseyleaf tansyaster	MATA2	*Machaeranthera tanacetifolia*	0–6	–
	Thurber's pepperweed	LETH2	*Lepidium thurberi*	0–2	–
	purslane	PORTU	*Portulaca*	0–2	–
	sawtooth sage	SASU7	*Salvia subincisa*	0–2	–
	spreading fanpetals	SIAB	*Sida abutifolia*	0–2	–
	sleepy silene	SIAN2	*Silene antirrhina*	0–2	–
	hyssopleaf sandmat	CHHY3	*Chamaesyce hyssopifolia*	0–2	–
	New Mexico thistle	CINE	*Cirsium neomexicanum*	0–2	–
	miner's lettuce	CLPEP	*Claytonia perfoliata ssp. perfoliata*	0–2	–
	sorrel buckwheat	ERPO4	*Eriogonum polycladon*	0–2	–
	wedgeleaf draba	DRCU	*Draba cuneifolia*	0–2	–
	American wild carrot	DAPU3	*Daucus pusillus*	0–2	–
	spurge	EUPHO	*Euphorbia*	0–2	–
	crestrib morning-glory	IPCO2	*Ipomoea costellata*	0–2	–
	redstar	IPCO3	*Ipomoea coccinea*	0–1	–
	ivyleaf morning-glory	IPHE	*Ipomoea hederacea*	0–1	–
	star gilia	GIST	*Gilia stellata*	0–1	–
	California goldfields	LACA7	*Lasthenia californica*	0–1	–

	sacred thorn-apple	DAWR2	*Datura wrightii*	0–1	–
	flatcrown buckwheat	ERDE6	*Eriogonum deflexum*	0–1	–
	Texas stork's bill	ERTE13	*Erodium texanum*	0–1	–
	spreading fleabane	ERDI4	*Erigeron divergens*	0–1	–
	scrambled eggs	COAU2	*Corydalis aurea*	0–1	–
	cryptantha	CRYPT	*Cryptantha*	0–1	–
	Esteve's pincushion	CHST	*Chaenactis stevioides*	0–1	–
	brittle spineflower	CHBR	*Chorizanthe brevicornu*	0–1	–
	hoary bowlesia	BOIN3	*Bowlesia incana*	0–1	–
	yellow tackstem	CAPA7	*Calycoseris parryi*	0–1	–
	white tackstem	CAWR	*Calycoseris wrightii*	0–1	–
	annual agoseris	AGHE2	*Agoseris heterophylla*	0–1	–
	woollyhead neststraw	STMI2	*Stylocline micropoides*	0–1	–
	sand fringepod	THCU	*Thysanocarpus curvipes*	0–1	–
	desert unicorn-plant	PRAL4	*Proboscidea althaeifolia*	0–1	–
	doubleclaw	PRPA2	*Proboscidea parviflora*	0–1	–
	chia	SACO6	*Salvia columbariae*	0–1	–
	creamcups	PLCA5	*Platystemon californicus*	0–1	–
	Fendler's desertdandelion	MAFE	*Malacothrix fendleri*	0–1	–
	Arizona lupine	LUAR4	*Lupinus arizonicus*	0–1	–
	miniature lupine	LUBI	*Lupinus bicolor*	0–1	–
	whitestem blazingstar	MEAL6	*Mentzelia albicaulis*	0–1	–
	green carpetweed	MOVE	*Mollugo verticillata*	0–1	–
	desert evening primrose	OEPR	*Oenothera primiveris*	0–1	–
	Florida pellitory	PAFL3	*Parietaria floridana*	0–1	–
	combseed	PECTO	*Pectocarya*	0–1	–
	manybristle chinchweed	PEPA2	*Pectis papposa*	0–1	–
Shrub/Vine					
7	**Evergreen shrubs**			1–56	
	Sonoran scrub oak	QUTU2	*Quercus turbinella*	0–11	–
	jojoba	SICH	*Simmondsia chinensis*	0–11	–
	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**			1–22	
	catclaw acacia	ACGR	*Acacia greggii*	1–6	–
	blue paloverde	PAFL6	*Parkinsonia florida*	0–6	–
	yellow paloverde	PAMI5	*Parkinsonia microphylla*	0–6	–
	whitethorn acacia	ACCO2	*Acacia constricta*	0–2	–
	whitethorn acacia	ACCOP9	*Acacia constricta var. paucispina*	0–1	–
	littleleaf sumac	RHMI3	*Rhus microphylla*	0–1	–
	skunkbush sumac	RHTR	*Rhus trilobata*	0–1	–
	lotebush	ZIOBC	*Ziziphus obtusifolia var. canescens*	0–1	–

	[illegible]	[illegible]	[illegible]	[illegible]	
	desert sweet	CHMI2	*Chamaebatiaria millefolium*	0–1	–
	ocotillo	FOSP2	*Fouquieria splendens*	0–1	–
	snapdragon penstemon	KEANM	*Keckiella antirrhinoides ssp. microphylla*	0–1	–
	creosote bush	LATR2	*Larrea tridentata*	0–1	–
	water jacket	LYAN	*Lycium andersonii*	0–1	–
	Berlandier's wolfberry	LYBE	*Lycium berlandieri*	0–1	–
	Arizona desert-thorn	LYEX	*Lycium exsertum*	0–1	–
	catclaw mimosa	MIACB	*Mimosa aculeaticarpa var. biuncifera*	0–1	–
9	**Dominant half shrubs**			17–112	
	fairyduster	CAER	*Calliandra eriophylla*	11–67	–
	bastardsage	ERWR	*Eriogonum wrightii*	1–17	–
	littleleaf ratany	KRER	*Krameria erecta*	1–11	–
	rough menodora	MESC	*Menodora scabra*	0–11	–
	desert zinnia	ZIAC	*Zinnia acerosa*	0–6	–
	prairie acacia	ACAN	*Acacia angustissima*	0–1	–
	Coulter's brickellbush	BRCO	*Brickellia coulteri*	0–1	–
	Eastern Mojave buckwheat	ERFA2	*Eriogonum fasciculatum*	0–1	–
10	**Succulents**			6–62	
	cactus apple	OPEN3	*Opuntia engelmannii*	6–22	–
	tulip pricklypear	OPPH	*Opuntia phaeacantha*	0–11	–
	banana yucca	YUBA	*Yucca baccata*	0–6	–
	devil's cholla	GRKU	*Grusonia kunzei*	0–2	–
	saguaro	CAGI10	*Carnegiea gigantea*	0–2	–
	Christmas cactus	CYLE8	*Cylindropuntia leptocaulis*	0–2	–
	walkingstick cactus	CYSP8	*Cylindropuntia spinosior*	0–2	–
	common sotol	DAWH2	*Dasylirion wheeleri*	0–1	–
	pinkflower hedgehog cactus	ECBO2	*Echinocereus bonkerae*	0–1	–
	Arizona hedgehog cactus	ECCOA	*Echinocereus coccineus var. arizonicus*	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	–
	spinystar	ESVI2	*Escobaria vivipara*	0–1	–
	candy barrelcactus	FEWI	*Ferocactus wislizeni*	0–1	–
	buck-horn cholla	CYAC8	*Cylindropuntia acanthocarpa*	0–1	–
	jumping cholla	CYFU10	*Cylindropuntia fulgida*	0–1	–
	Graham's nipple cactus	MAGR9	*Mammillaria grahamii*	0–1	–
	sacahuista	NOMI	*Nolina microcarpa*	0–1	–
	purple pricklypear	OPMA8	*Opuntia macrocentra*	0–1	–
	soaptree yucca	YUEL	*Yucca elata*	0–1	–
	goldenflower century plant	AGCH2	*Agave chrysantha*	0–1	

	goldenflower century plant	AGCH2	*Agave chrysantha*	0–1	–
	Palmer's century plant	AGPA3	*Agave palmeri*	0–1	–
11	**Increaser half-shrubs**			2–28	
	broom snakeweed	GUSA2	*Gutierrezia sarothrae*	1–22	–
	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**			0–17	
	redberry juniper	JUCO11	*Juniperus coahuilensis*	0–6	–
	oneseed juniper	JUMO	*Juniperus monosperma*	0–6	–
	Utah juniper	JUOS	*Juniperus osteosperma*	0–6	–
	velvet mesquite	PRVE	*Prosopis velutina*	0–6	–
	western honey mesquite	PRGLT	*Prosopis glandulosa var. torreyana*	0–2	–
	crucifixion thorn	CAHO3	*Canotia holacantha*	0–2	–

Animal community

The Sandy Loam Upland ecological site is suitable for grazing year round, and is easily traversed by livestock. Tobosa is very unpalatable and will be the last perennial grass species to be used on this site. 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 larger mammals like deer and javalina. Water developments are very important to both livestock and wildlife on this site.

Hydrological functions

The Sandy Loam Upland ecological site has a smooth to rough surface with variable covers of gravels and stones. Due to clayey textured soils it is a good producer of runoff. It produces exceptional runoff when heavy rain falls on snow or moist soils.

Recreational uses

Recreational uses include hunting, camping, horseback riding, backpacking, rock hounding, and photography.

Wood products

Limited fuel-wood for campfires and branding fires. In areas where mesquite or juniper has increased there may be more wood available for fuel and for fence stays.

Other products

There is some harvest of food plants like prickly pear tunas, jojoba nuts, wild onions, and grass nuts. There is limited harvest of medicinal plants like Mormon tea. There is limited harvest of fibers from banana yucca. Clay is available for pot making.

Other references

Similar to Community type 5 of TES Map Unit # 370 on the Prescott National Forest.

Contributors

Dan Robinett
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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):**

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:**