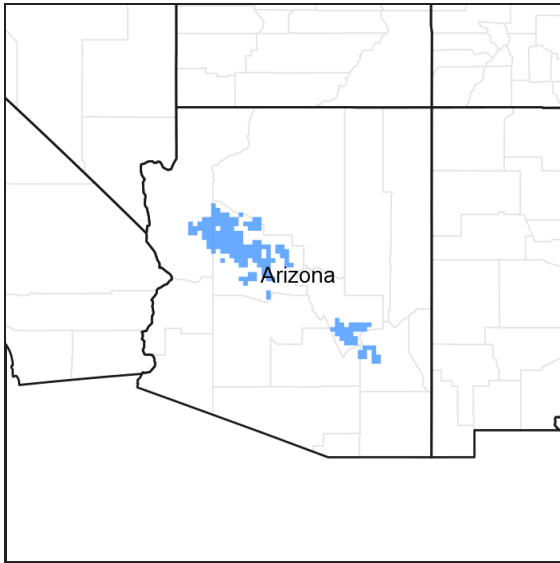


# **Ecological site R038XA103AZ Clay Loam Upland 12-16" p.z.**

Accessed: 05/08/2024

## 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 Interior Chaparral

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

R038XA106AZ	<b>Limy Upland 12-16" p.z.</b>
R038XA108AZ	<b>Clayey Slopes 12-16" p.z.</b>
R038XA126AZ	<b>Limy Slopes 12-16" p.z.</b>

## Similar sites

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

Table 1. Dominant plant species

Tree	Not specified
Shrub	(1) <i>Opuntia engelmannii</i> (2) <i>Calliandra eriophylla</i>
Herbaceous	(1) <i>Pleuraphis mutica</i> (2) <i>Hilaria belangeri</i>

## 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, fan terraces, ridge-tops and mesa tops.

Table 2. Representative physiographic features

Landforms	(1) Fan piedmont (2) Mesa (3) Lava flow
Flooding frequency	None
Elevation	945–1,402 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% in the northwest part of the area to 50/50% in the southeast part. Summer rains fall July through September; are from high-intensity, convective thunderstorms. This moisture originates primarily from the Gulf of Mexico, but can come from the remnants of Pacific hurricanes in September. Winter moisture is frontal, originates in the north Pacific, and falls as rain or snow in widespread storms of low intensity and long duration. Snowfall ranges from a trace to 10 inches per year and can occur from November through March. Snow seldom persists for more than a day except on north aspects. May and June are the driest months of the year. Humidity is generally low all year. Average annual air temperatures range from 59 to 70 degrees F (thermic temperature regime). Daytime temperatures in the summer are commonly in the high 90's. Freezing temperatures are common from October through April, usually during the night or early morning hours. The actual precipitation, available moisture and temperature vary, depending on, region, elevation, rain shadow effect and aspect.

Table 3. Representative climatic features

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

## Influencing water features

There are no water features associated with this site.

## Soil features

These soils are moderately deep to deep (30-60 inches) and dark colored in the surface (6-12 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 mapped on this site include: SSA-627 Mohave County Southern Part MU's Arivaca-54, Penthouse-87 & Eloma-118; SSA-637 Yavapai County Western Part MU's Arp-AuC, AxD, AyC, Cabezon-ThC, Jacks-JaC, Thunderbird-TdC, ThC & VtC; SSA-639 Black Hills-Sedona Area MU's Mingus-420, Tapco-420, Ryallen-423, Eloma-424, Penthouse-437, 441, 541 & 641; SSA-675 San Carlos Indian Reservation Area MU Eloma-590; SSA-697 Mohave County Central Part MU's Arivaca-45 & Nuffel-81.

**Table 4. Representative soil features**

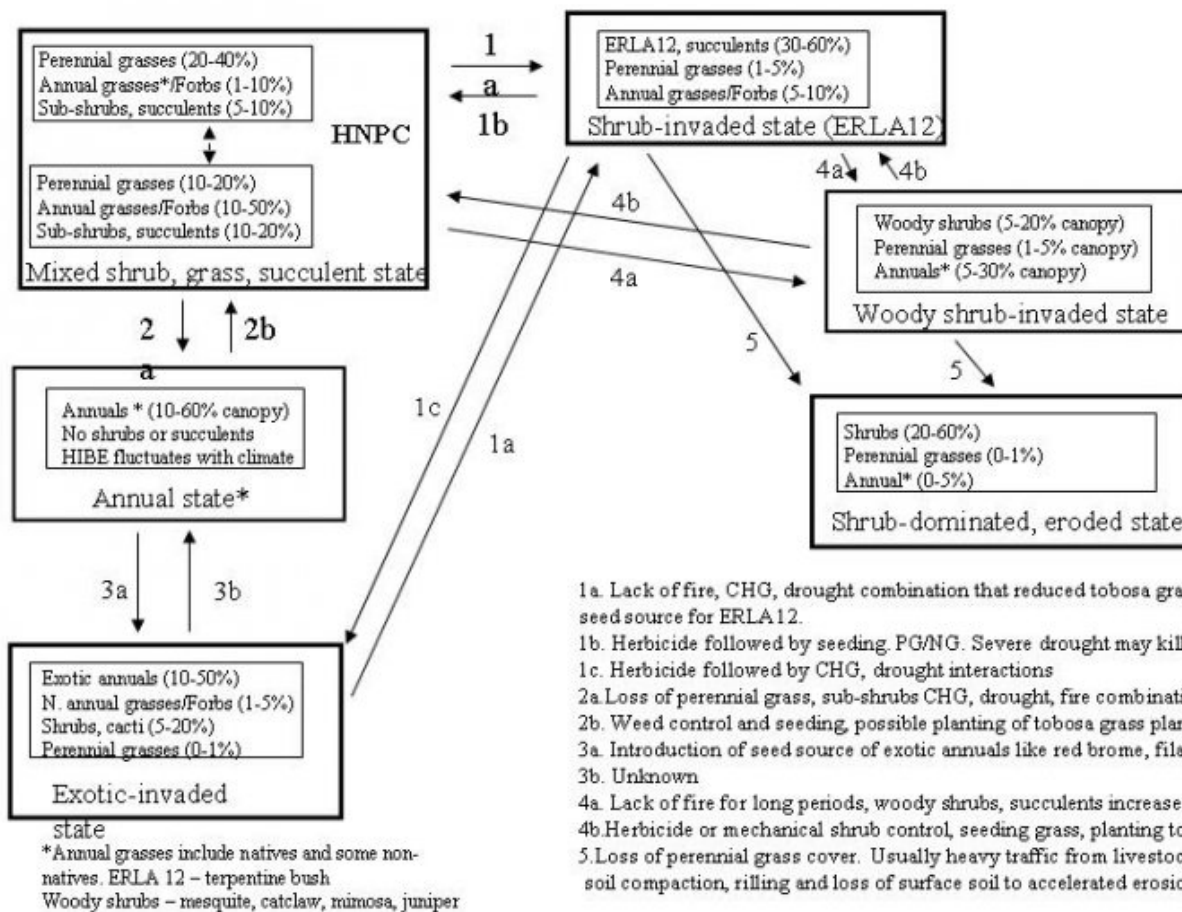
Surface texture	(1) Gravelly clay loam (2) Very gravelly loam (3) Very gravelly clay loam
Family particle size	(1) Clayey
Drainage class	Well drained
Permeability class	Moderately slow to slow
Soil depth	76–152 cm
Surface fragment cover <=3"	15–60%
Surface fragment cover >3"	1–10%
Available water capacity (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

## MLRA 38.1 (12-16"), Clayloam Upland



### State 1 Native Mixed Grassland-Shrub State

#### Community 1.1 Historic Native Plant Community



Figure 4. Clayloam Upland 12-16" pz., HCPC



Figure 5. Clayloam Upland 12-16" pz., HCPC

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
<b>Total</b>	<b>440</b>	<b>1015</b>	<b>1743</b>

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 7. 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

## Community 1.2 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 2 Annuals State

### Community 2.1 Annual Dominated Plant Community

Palatable midgrasses have been replaced by annual species like tumble mustard and wild oats. Tobosa is still present in high levels.

## State 3 Exotic Annuals Invaded State

### Community 3.1 Exotic Annual invaded state



**Figure 8. Annuals**

Palatable midgrasses have been replaced by annual species. Tobosa still occurs in normal amounts. 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 Dominated State**

### **Community 4.1 Shrub Dominated Plant Community**

Palatable midgrasses have been replaced by annual species like tumble mustard and wild oats. Tobosa is still present, but at reduced levels. Through a combination of drought, continuous heavy grazing and lack of fire has reduced tobosa grass cover. Shrubs, like turpentine bush, prickly pear, and banana yucca can increase across the site.

## **State 5 Woody Shrub Invaded State**

### **Community 5.1 Woody Shrub Dominated Plant Community**



**Figure 9. Clayloam Upland 12-16" pz., shrubby**



**Figure 10. Shrub Increase**



**Figure 11. Clayloam Upland 12-16" pz., shrubby**



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 6 Eroded State

### Community 6.1 Shrub Invaded, Eroded Plant Community



Figure 12. Clayloam Upland 12-16" pz., erosion



Figure 13. Eroded

Shrubs like mesquite, paloverde 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 (%)
<b>Grass/Grasslike</b>					
1	<b>Dominant perennial grasses</b>			336–673	
	tobosagrass	PLMU3	<i>Pleuraphis mutica</i>	280–560	–
	sideoats grama	BOCU	<i>Bouteloua curtipendula</i>	56–112	–
2	<b>Cool season grasses</b>			1–56	
	squirreltail	ELEL5	<i>Elymus elymoides</i>	1–56	–
3	<b>Misc. perennial grasses</b>			56–280	
	curly-mesquite	HIBE	<i>Hilaria belangeri</i>	39–168	–
	black grama	BOER4	<i>Bouteloua eriopoda</i>	6–56	–
	Parish's threeawn	ARPUP5	<i>Aristida purpurea</i> var. <i>parishii</i>	1–56	–
	spidergrass	ARTE3	<i>Aristida ternipes</i>	1–56	–
	hairy grama	BOHI2	<i>Bouteloua hirsuta</i>	0–56	–
	slender grama	BORE2	<i>Bouteloua repens</i>	0–56	–
	purple threeawn	ARPU9	<i>Aristida purpurea</i>	6–56	–
	red grama	BOTR2	<i>Bouteloua trifida</i>	0–22	–
	spidergrass	ARTEG	<i>Aristida ternipes</i> var. <i>gentilis</i>	0–17	–
	bush muhly	MUPO2	<i>Muhlenbergia porteri</i>	0–17	–
	Hall's panicgrass	PAHA	<i>Panicum hallii</i>	0–17	–
	vine mesquite	PAOB	<i>Panicum obtusum</i>	0–17	–
	plains bristlegrass	SEVU2	<i>Setaria vulpiseta</i>	0–17	–
	blue grama	BOGR2	<i>Bouteloua gracilis</i>	0–17	–
	Fendler threeawn	ARPUL	<i>Aristida purpurea</i> var. <i>longiseta</i>	0–11	–
	green sprangletop	LEDU	<i>Leptochloa dubia</i>	0–6	–
	sand dropseed	SPCR	<i>Sporobolus cryptandrus</i>	0–6	–
	cane bluestem	BOBA3	<i>Bothriochloa barbinodis</i>	0–6	–
	Arizona cottontop	DICA8	<i>Digitaria californica</i>	0–6	–
	fall witchgrass	DICO6	<i>Digitaria cognata</i>	0–2	–
	slim tridens	TRMU	<i>Tridens muticus</i>	0–2	–
	plains lovegrass	ERIN	<i>Eragrostis intermedia</i>	0–1	–
	tanglehead	HECO10	<i>Heteropogon contortus</i>	0–1	–
4	<b>Annual grasses</b>			6–224	
	sixweeks fescue	VUOC	<i>Vulpia octoflora</i>	1–56	–
	mucronate sprangletop	LEPAB	<i>Leptochloa panicea</i> ssp. <i>brachiata</i>	0–28	–
	sixweeks threeawn	ARAD	<i>Aristida adscensionis</i>	1–22	–
	small fescue	VUMI	<i>Vulpia microstachys</i>	0–22	–

	Arizona signalgrass	URAR	<i>Urochloa arizonica</i>	0-17	-
	Mexican panicgrass	PAHI5	<i>Panicum hirticaule</i>	0-17	-
	Rothrock's grama	BORO2	<i>Bouteloua rothrockii</i>	0-11	-
	Eastwood fescue	VUMIC	<i>Vulpia microstachys var. ciliata</i>	0-11	-
	witchgrass	PACA6	<i>Panicum capillare</i>	0-6	-
	prairie threeawn	AROL	<i>Aristida oligantha</i>	0-6	-
	Arizona brome	BRAR4	<i>Bromus arizonicus</i>	0-2	-
	feather fingergrass	CHVI4	<i>Chloris virgata</i>	0-2	-
	delicate muhly	MUFR	<i>Muhlenbergia fragilis</i>	0-2	-
	littleseed muhly	MUMI	<i>Muhlenbergia microsperma</i>	0-2	-
	Bigelow's bluegrass	POBI	<i>Poa bigelovii</i>	0-1	-
	canyon cupgrass	ERLE7	<i>Eriochloa lemmonii</i>	0-1	-
	tufted lovegrass	ERPE	<i>Eragrostis pectinacea</i>	0-1	-
	desert lovegrass	ERPEM	<i>Eragrostis pectinacea var. miserrima</i>	0-1	-
	little barley	HOPU	<i>Hordeum pusillum</i>	0-1	-
	Mexican sprangletop	LEFUU	<i>Leptochloa fusca ssp. uninervia</i>	0-1	-
	needle grama	BOAR	<i>Bouteloua aristidoides</i>	0-1	-
	sixweeks grama	BOBA2	<i>Bouteloua barbata</i>	0-1	-

#### Forb

5	<b>Perennial forbs</b>			6-45	
	largeflower onion	ALMA4	<i>Allium macropetalum</i>	0-6	-
	weakleaf bur ragweed	AMCO3	<i>Ambrosia confertiflora</i>	1-6	-
	bluedicks	DICA14	<i>Dichelostemma capitatum</i>	1-6	-
	slender janusia	JAGR	<i>Janusia gracilis</i>	0-6	-
	desert globemallow	SPAM2	<i>Sphaeralcea ambigua</i>	1-6	-
	brownplume wirelettuce	STPA4	<i>Stephanomeria pauciflora</i>	1-6	-
	Gila manroot	MAGI	<i>Marah gilensis</i>	0-2	-
	lacy tansyaster	MAPI	<i>Machaeranthera pinnatifida</i>	0-2	-
	Coues' cassia	SECO10	<i>Senna covesii</i>	0-2	-
	wishbone-bush	MILAV	<i>Mirabilis laevis var. villosa</i>	0-2	-
	tuber anemone	ANTU	<i>Anemone tuberosa</i>	0-2	-
	perennial rockcress	ARPE2	<i>Arabis perennans</i>	1-2	-
	dense ayenia	AYMI	<i>Ayenia microphylla</i>	0-1	-
	desert marigold	BAMU	<i>Baileya multiradiata</i>	0-1	-
	scarlet spiderling	BOCO	<i>Boerhavia coccinea</i>	0-1	-
	climbing wartclub	BOSC	<i>Boerhavia scandens</i>	0-1	-
	wavyleaf Indian paintbrush	CAAPM	<i>Castilleja applegatei ssp. martinii</i>	0-1	-
	Arizona wrightwort	CAAR7	<i>Carlowrightia arizonica</i>	0-1	-
	desert mariposa lily	CAKE	<i>Calochortus kennedyi</i>	0-1	-
	sego lily	CANU3	<i>Calochortus nuttallii</i>	0-1	-
	leatherweed	CRPO5	<i>Croton pottsii</i>	0-1	-
	Gregg's prairie clover	DAGR2	<i>Dalea greggii</i>	0-1	-
	Cooley's bundleflower	DECO2	<i>Desmanthus cooleyi</i>	0-1	-

	desert larkspur	DEPA	<i>Delphinium parishii</i>	0-1	-
	tall mountain larkspur	DESC	<i>Delphinium scaposum</i>	0-1	-
	narrowleaf silverbush	ARLA12	<i>Argythamnia lanceolata</i>	0-1	-
	white sagebrush	ARLUM2	<i>Artemisia ludoviciana ssp. mexicana</i>	0-1	-
	New Mexico silverbush	ARNE2	<i>Argythamnia neomexicana</i>	0-1	-
	dwarf desertpeony	ACNA2	<i>Acourtia nana</i>	0-1	-
	brownfoot	ACWR5	<i>Acourtia wrightii</i>	0-1	-
	San Felipe dogweed	ADPO	<i>Adenophyllum porophylloides</i>	0-1	-
	trailing windmills	ALIN	<i>Allionia incarnata</i>	0-1	-
	desert tobacco	NIOB	<i>Nicotiana obtusifolia</i>	0-1	-
	New Mexico groundsel	PANE7	<i>Packera neomexicana</i>	0-1	-
	Oak Creek ragwort	PAQU8	<i>Packera quercetorum</i>	0-1	-
	toadflax penstemon	PELI2	<i>Penstemon linarioides</i>	0-1	-
	Parry's beardtongue	PEPA24	<i>Penstemon parryi</i>	0-1	-
	desert penstemon	PEPS	<i>Penstemon pseudospectabilis</i>	0-1	-
	orange fameflower	PHAU13	<i>Phemeranthus aurantiacus</i>	0-1	-
	slender poreleaf	POGR5	<i>Porophyllum gracile</i>	0-1	-
	glandleaf milkwort	POMA7	<i>Polygala macradenia</i>	0-1	-
	canaigre dock	RUHY	<i>Rumex hymenosepalus</i>	0-1	-
	twinleaf senna	SEBA3	<i>Senna bauhinioides</i>	0-1	-
	ragged nettlespurge	JAMA	<i>Jatropha macrorhiza</i>	0-1	-
	longflower tube tongue	JULO3	<i>Justicia longii</i>	0-1	-
	Wright's deervetch	LOWR	<i>Lotus wrightii</i>	0-1	-
	fleabane	ERIGE2	<i>Erigeron</i>	0-1	-
	desert trumpet	ERIN4	<i>Eriogonum inflatum</i>	0-1	-
	Mojave spurge	EUSC6	<i>Euphorbia schizoloba</i>	0-1	-
	southwestern mock vervain	GLGO	<i>Glandularia gooddingii</i>	0-1	-
	desert rosemallow	HICO	<i>Hibiscus coulteri</i>	0-1	-
	Indian rushpea	HOGL2	<i>Hoffmannseggia glauca</i>	0-1	-
	Lemmon's ragwort	SELE8	<i>Senecio lemmonii</i>	0-1	-
	New Mexico fanpetals	SINE	<i>Sida neomexicana</i>	0-1	-
	silverleaf nightshade	SOEL	<i>Solanum elaeagnifolium</i>	0-1	-
	plains blackfoot	MELE2	<i>Melampodium leucanthum</i>	0-1	-
	branched noseburn	TRRA5	<i>Tragia ramosa</i>	0-1	-
	Louisiana vetch	VILUL2	<i>Vicia ludoviciana ssp. ludoviciana</i>	0-1	-
6	<b>Annual forbs</b>			2-224	
	bristly fiddleneck	AMTE3	<i>Amsinckia tessellata</i>	0-56	-
	Arizona popcornflower	PLAR	<i>Plagiobothrys arizonicus</i>	0-56	-
	longleaf false goldeneye	HELOA2	<i>Heliomeris longifolia var. annua</i>	1-28	-
	California poppy	ESCAM	<i>Eschscholzia californica ssp. mexicana</i>	0-28	-
	Gordon's bladderpod	LEGO	<i>Lesquerella gordonii</i>	0-17	-
	Coulter's spiderling	BOCO2	<i>Boerhavia coulteri</i>	0-17	-
	coastal bird's-foot trefoil	LOSA	<i>Lotus salsuainosus</i>	0-17	-

Coulter's lupine	LUSP2	<i>Lupinus sparsiflorus</i>	0-17	-
desert Indianwheat	PLOV	<i>Plantago ovata</i>	0-17	-
thelypody	THELY	<i>Thelypodium</i>	0-11	-
exserted Indian paintbrush	CAEXE	<i>Castilleja exserta ssp. exserta</i>	0-11	-
western tansymustard	DEPI	<i>Descurainia pinnata</i>	0-11	-
Arizona poppy	KAGR	<i>Kallstroemia grandiflora</i>	0-11	-
miniature woollystar	ERDI2	<i>Eriastrum diffusum</i>	0-11	-
carelessweed	AMPA	<i>Amaranthus palmeri</i>	0-11	-
milkvetch	ASTRA	<i>Astragalus</i>	0-6	-
shaggyfruit pepperweed	LELA	<i>Lepidium lasiocarpum</i>	0-6	-
foothill deervetch	LOHU2	<i>Lotus humistratus</i>	0-6	-
desertparsley	LOMAT	<i>Lomatium</i>	0-6	-
fivewing spiderling	BOIN	<i>Boerhavia intermedia</i>	0-6	-
pitseed goosefoot	CHBE4	<i>Chenopodium berlandieri</i>	0-6	-
woolly tidestromia	TILA2	<i>Tidestromia lanuginosa</i>	0-6	-
phacelia	PHACE	<i>Phacelia</i>	0-6	-
New Mexico plumeseed	RANE	<i>Rafinesquia neomexicana</i>	0-6	-
woolly plantain	PLPA2	<i>Plantago patagonica</i>	0-6	-
slender goldenweed	MAGR10	<i>Machaeranthera gracilis</i>	0-6	-
tanseyleaf tansyaster	MATA2	<i>Machaeranthera tanacetifolia</i>	0-6	-
purslane	PORTU	<i>Portulaca</i>	0-2	-
sawtooth sage	SASU7	<i>Salvia subincisa</i>	0-2	-
spreading fanpetals	SIAB	<i>Sida abutifolia</i>	0-2	-
sleepy silene	SIAN2	<i>Silene antirrhina</i>	0-2	-
hyssopleaf sandmat	CHHY3	<i>Chamaesyce hyssopifolia</i>	0-2	-
wedgeleaf draba	DRCU	<i>Draba cuneifolia</i>	0-2	-
American wild carrot	DAPU3	<i>Daucus pusillus</i>	0-2	-
New Mexico thistle	CINE	<i>Cirsium neomexicanum</i>	0-2	-
miner's lettuce	CLPEP	<i>Claytonia perfoliata ssp. perfoliata</i>	0-2	-
Thurber's pepperweed	LETH2	<i>Lepidium thurberi</i>	0-2	-
spurge	EUPHO	<i>Euphorbia</i>	0-2	-
sorrel buckwheat	ERPO4	<i>Eriogonum polycladon</i>	0-2	-
crestrub morning-glory	IPCO2	<i>Ipomoea costellata</i>	0-2	-
redstar	IPCO3	<i>Ipomoea coccinea</i>	0-1	-
ivyleaf morning-glory	IPHE	<i>Ipomoea hederacea</i>	0-1	-
Texas stork's bill	ERTE13	<i>Erodium texanum</i>	0-1	-
spreading fleabane	ERDI4	<i>Erigeron divergens</i>	0-1	-
star gilia	GIST	<i>Gilia stellata</i>	0-1	-
California goldfields	LACA7	<i>Lasthenia californica</i>	0-1	-
scrambled eggs	COAU2	<i>Corydalis aurea</i>	0-1	-
cryptantha	CRYPT	<i>Cryptantha</i>	0-1	-
sacred thorn-apple	DAWR2	<i>Datura wrightii</i>	0-1	-
flatcrown buckwheat	ERDE6	<i>Eriogonum deflexum</i>	0-1	-

	Esteve's pincushion	CHST	<i>Chaenactis stevioides</i>	0-1	-
	brittle spineflower	CHBR	<i>Chorizanthe brevicornu</i>	0-1	-
	hoary bowlesia	BOIN3	<i>Bowlesia incana</i>	0-1	-
	yellow tackstem	CAPA7	<i>Calycoseris parryi</i>	0-1	-
	white tackstem	CAWR	<i>Calycoseris wrightii</i>	0-1	-
	annual agoseris	AGHE2	<i>Agoseris heterophylla</i>	0-1	-
	woollyhead neststraw	STMI2	<i>Stylocline micropoides</i>	0-1	-
	sand fringe pod	THCU	<i>Thysanocarpus curvipes</i>	0-1	-
	chia	SACO6	<i>Salvia columbariae</i>	0-1	-
	creamcups	PLCA5	<i>Platystemon californicus</i>	0-1	-
	desert unicorn-plant	PRAL4	<i>Proboscidea althaeifolia</i>	0-1	-
	doubleclaw	PRPA2	<i>Proboscidea parviflora</i>	0-1	-
	Fendler's desertydandelion	MAFE	<i>Malacothrix fendleri</i>	0-1	-
	Arizona lupine	LUAR4	<i>Lupinus arizonicus</i>	0-1	-
	miniature lupine	LUBI	<i>Lupinus bicolor</i>	0-1	-
	whitestem blazingstar	MEAL6	<i>Mentzelia albicaulis</i>	0-1	-
	green carpetweed	MOVE	<i>Mollugo verticillata</i>	0-1	-
	desert evening primrose	OEPR	<i>Oenothera primiveris</i>	0-1	-
	Florida pellitory	PAFL3	<i>Parietaria floridana</i>	0-1	-
	combseed	PECTO	<i>Pectocarya</i>	0-1	-
	manybristle chinchweed	PEPA2	<i>Pectis papposa</i>	0-1	-

#### Shrub/Vine

7	<b>Evergreen shrubs</b>			1-56	
	Sonoran scrub oak	QUTU2	<i>Quercus turbinella</i>	0-11	-
	jojoba	SICH	<i>Simmondsia chinensis</i>	0-11	-
	redberry buckthorn	RHCR	<i>Rhamnus crocea</i>	0-1	-
	longleaf jointfir	EPTR	<i>Ephedra trifurca</i>	0-1	-
	red barberry	MAHA4	<i>Mahonia haematocarpa</i>	0-1	-
	algerita	MATR3	<i>Mahonia trifoliolata</i>	0-1	-
8	<b>Miscellaneous large shrubs</b>			1-22	
	catclaw acacia	ACGR	<i>Acacia greggii</i>	1-6	-
	blue paloverde	PAFL6	<i>Parkinsonia florida</i>	0-6	-
	yellow paloverde	PAMI5	<i>Parkinsonia microphylla</i>	0-6	-
	whitethorn acacia	ACCO2	<i>Acacia constricta</i>	0-2	-
	whitethorn acacia	ACCOP9	<i>Acacia constricta</i> var. <i>paucispina</i>	0-1	-
	desert sweet	CHMI2	<i>Chamaebatiaria millefolium</i>	0-1	-
	ocotillo	FOSP2	<i>Fouquieria splendens</i>	0-1	-
	snapdragon penstemon	KEANM	<i>Keckiella antirrhinoides</i> ssp. <i>microphylla</i>	0-1	-
	creosote bush	LATR2	<i>Larrea tridentata</i>	0-1	-
	water jacket	LYAN	<i>Lycium andersonii</i>	0-1	-
	Berlandier's wolfberry	LYBE	<i>Lycium berlandieri</i>	0-1	-
	Arizona desert-thorn	LYEX	<i>Lycium exsertum</i>	0-1	-
	catclaw mimosa	MIACB	<i>Mimosa aculeaticarpa</i> var. <i>biuncifera</i>	0-1	-

	littleleaf sumac	RHMI3	<i>Rhus microphylla</i>	0–1	–
	skunkbush sumac	RHTR	<i>Rhus trilobata</i>	0–1	–
	lotebush	ZIOBC	<i>Ziziphus obtusifolia</i> var. <i>canescens</i>	0–1	–
9	<b>Dominant half shrubs</b>			17–112	
	fairyduster	CAER	<i>Calliandra eriophylla</i>	11–67	–
	bastardsage	ERWR	<i>Eriogonum wrightii</i>	1–17	–
	littleleaf ratany	KRER	<i>Krameria erecta</i>	1–11	–
	rough menodora	MESC	<i>Menodora scabra</i>	0–11	–
	desert zinnia	ZIAC	<i>Zinnia acerosa</i>	0–6	–
	prairie acacia	ACAN	<i>Acacia angustissima</i>	0–1	–
	Coulter's brickellbush	BRCO	<i>Brickellia coulteri</i>	0–1	–
	Eastern Mojave buckwheat	ERFA2	<i>Eriogonum fasciculatum</i>	0–1	–
10	<b>Succulents</b>			6–62	
	cactus apple	OPEN3	<i>Opuntia engelmannii</i>	6–22	–
	tulip pricklypear	OPPH	<i>Opuntia phaeacantha</i>	0–11	–
	banana yucca	YUBA	<i>Yucca baccata</i>	0–6	–
	devil's cholla	GRKU	<i>Grusonia kunzei</i>	0–2	–
	saguaro	CAGI10	<i>Carnegiea gigantea</i>	0–2	–
	Christmas cactus	CYLE8	<i>Cylindropuntia leptocaulis</i>	0–2	–
	walkingstick cactus	CYSP8	<i>Cylindropuntia spinosior</i>	0–2	–
	common sotol	DAWH2	<i>Dasyilirion wheeleri</i>	0–1	–
	pinkflower hedgehog cactus	ECBO2	<i>Echinocereus bonkeriae</i>	0–1	–
	Arizona hedgehog cactus	ECCOA	<i>Echinocereus coccineus</i> var. <i>arizonicus</i>	0–1	–
	Engelmann's hedgehog cactus	ECEN	<i>Echinocereus engelmannii</i>	0–1	–
	redspine fishhook cactus	ECER2	<i>Echinomastus erectocentrus</i>	0–1	–
	pinkflower hedgehog cactus	ECFA	<i>Echinocereus fasciculatus</i>	0–1	–
	spiny star	ESVI2	<i>Escobaria vivipara</i>	0–1	–
	candy barrelcactus	FEWI	<i>Ferocactus wislizeni</i>	0–1	–
	goldenflower century plant	AGCH2	<i>Agave chrysantha</i>	0–1	–
	Palmer's century plant	AGPA3	<i>Agave palmeri</i>	0–1	–
	buck-horn cholla	CYAC8	<i>Cylindropuntia acanthocarpa</i>	0–1	–
	jumping cholla	CYFU10	<i>Cylindropuntia fulgida</i>	0–1	–
	Graham's nipple cactus	MAGR9	<i>Mammillaria grahamii</i>	0–1	–
	sacahuista	NOMI	<i>Nolina microcarpa</i>	0–1	–
	purple pricklypear	OPMA8	<i>Opuntia macrocentra</i>	0–1	–
	soaptree yucca	YUEL	<i>Yucca elata</i>	0–1	–
11	<b>Increase half-shrubs</b>			2–28	
	broom snakeweed	GUSA2	<i>Gutierrezia sarothrae</i>	1–22	–
	burroweed	ISTE2	<i>Isocoma tenuisecta</i>	0–1	–
	yerba de pasmo	BAPT	<i>Baccharis pteronioides</i>	0–1	–
	button brittlebush	ENFR	<i>Encelia frutescens</i>	0–1	–

	turpentine bush	ERLA12	<i>Ericameria laricifolia</i>	0–1	–
	threadleaf snakeweed	GUMI	<i>Gutierrezia microcephala</i>	0–1	–
<b>Tree</b>					
12	<b>Trees</b>			0–17	
	redberry juniper	JUCO11	<i>Juniperus coahuilensis</i>	0–6	–
	oneseed juniper	JUMO	<i>Juniperus monosperma</i>	0–6	–
	Utah juniper	JUOS	<i>Juniperus osteosperma</i>	0–6	–
	velvet mesquite	PRVE	<i>Prosopis velutina</i>	0–6	–
	crucifixion thorn	CAHO3	<i>Canotia holacantha</i>	0–2	–
	western honey mesquite	PRGLT	<i>Prosopis glandulosa var. torreyana</i>	0–2	–

## Animal community

This 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

This 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

Hunting, camping, horseback riding, backpacking, rock hounding, 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 for pot making.

## Other references

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

## Contributors

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## 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)	Karlyn Huling
Contact for lead author	NRCS Globe Soil Survey Office
Date	05/15/2006
Approved by	S. Cassady
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

## Indicators

- 1. Number and extent of rills:** Some rill formation may occur due to loam and clay loam surface soils, slow permeability, and medium runoff. Rills, if present, could be more common on steeper slopes and less common on the surfaces that are protected by rock fragment armor.

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- 2. Presence of water flow patterns:** Water flow patterns may be common due to the slow permeability and medium runoff.

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- 3. Number and height of erosional pedestals or terracettes:** Pedestals and terracettes may occur, but they should be very short.

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- 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 4 inches, so it has a moderate potential to produce plant cover. One area had 35% bare ground and 25% rock fragment cover. Areas with a lot of rock fragment armor will have less bare ground. Drought may cause an increase in bare ground.

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- 5. Number of gullies and erosion associated with gullies:** None

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- 6. Extent of wind scoured, blowouts and/or depositional areas:** None

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- 7. Amount of litter movement (describe size and distance expected to travel):** Herbaceous and fine woody litter will be transported in water flow pathways. Coarse woody litter will remain under shrub and tree canopies.

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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 textures are generally clay loam or loam. Most surface soil horizons are gravelly or cobbly. The aggregate stability values can be fairly low due to the tendency for clayey soils to shrink/swell with changes in moisture. Aggregate stability values from one area averaging 6 under plant canopy (due to tobosa root mats) to only 1 in the interspaces. When well vegetated and/or protected by rock armor, these soils have a moderate to high resistance to both water and wind erosion.

- 
9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** Surface structure is both granular (moderate, very fine to fine) and platy (moderate to strong, thin to medium). A few soils have a subangular blocky (weak to moderate, fine) surface structure. Surface thickness range is 1-4 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 fairly uniform distribution of mostly grasses with some shrubs and a few forbs. One area had 32% canopy cover (28% grass, 4% shrubs) and 16% basal cover (14% grass, 2% shrubs). Both canopy and basal cover values (especially canopy) decrease during a prolonged drought. This type of plant community is highly effective at capturing and storing precipitation.
- 
11. **Presence and thickness of compaction layer (usually none; describe soil profile features which may be mistaken for compaction on this site):** None. Due to the loam and clay loam surface textures, all soils may be easily compacted at the very surface unless there are a lot of rock fragments in the surface horizons. Most of the soils have gravelly or cobbly surfaces. Some of the soils have a naturally platy surface structure.
- 
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 bunchgrasses > deciduous shrub > forbs evergreen (chapparral) shrubs > cool season colonizing grasses > cacti = Agave family = trees
- Other:
- 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 survive in all years except during the most severe droughts. Severe winter drought affects trees and shrubs most. Severe summer drought affects grasses most.
- 
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, but decrease in the later years.
- 
15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):** 750-850 lbs/ac dry years; 850-1025 median years; 1025-1100 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: Broom snakeweed, Utah juniper, prickly pear cacti and cholla cacti are all native to the site but can have the potential to increase and dominate the area after heavy grazing. Prosopis (mesquite) is native to neighboring sites and can invade and dominate the site after heavy grazing.

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