

Ecological site R040XA112AZ **Loamy Swale 10"-13" p.z.**

Accessed: 05/18/2024

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.

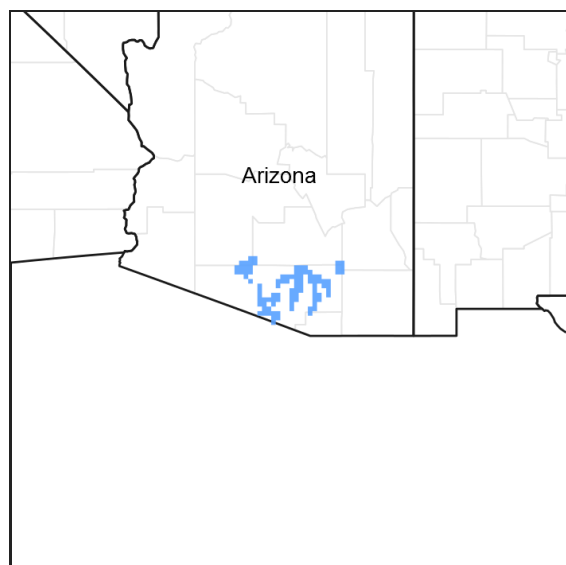


Figure 1. Mapped extent

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): 040X–Sonoran Basin and Range

AZ 40.1 – Upper Sonoran Desert

Elevations range from 2000 to 3200 feet and precipitation averages 10 to 13 inches per year. Vegetation includes saguaro, palo verde, mesquite, creosotebush, triangle bursage, prickly pear, cholla, limberbush, wolfberry, bush muhly, threeawns, ocotillo, and globe mallow. The soil temperature regime is thermic and the soil moisture regime is typic aridic. This unit occurs within the Basin and Range Physiographic Province and is characterized by numerous mountain ranges that rise abruptly from broad, plain-like valleys and basins. Igneous and metamorphic rock classes dominate the mountain ranges and sediments filling the basins represent combinations of fluvial, lacustrine, colluvial and alluvial deposits.

Associated sites

R040XA102AZ	Clayey Swale 10"-13" p.z.
R040XA108AZ	Limy Fan 10"-13" p.z.
R040XA110AZ	Limy Slopes 10"-13" p.z.
R040XA114AZ	Loamy Upland 10"-13" p.z.

Similar sites

R041XC311AZ	Loamy Swale 12-16" p.z.
R040XB211AZ	Loamy Swale 7"-10" p.z.
R041XB209AZ	Loamy Swale 8-12" p.z.

Table 1. Dominant plant species

Tree	(1) <i>Prosopis velutina</i>
Shrub	(1) <i>Acacia constricta</i>
Herbaceous	(1) <i>Pappophorum vaginatum</i> (2) <i>Panicum obtusum</i>

Physiographic features

This site occurs in the upper elevations of the Sonoran Desert in southern Arizona. It benefits on a regular basis from extra moisture received as overbank flooding and/or runoff from adjacent upland sites. It occurs on flood plains and alluvial fans.

Table 2. Representative physiographic features

Landforms	(1) Flood plain (2) Alluvial fan (3) Stream terrace
Flooding duration	Very brief (4 to 48 hours) to brief (2 to 7 days)
Flooding frequency	Rare to occasional
Ponding duration	Very brief (4 to 48 hours) to brief (2 to 7 days)
Ponding frequency	None to rare
Elevation	564–1,006 m
Slope	0–2%
Aspect	Aspect is not a significant factor

Climatic features

Precipitation in the sub resource area ranges from 10 to 13 inches in the southern part, along the Mexican border with elevations from about 1900 to 3200 feet. Precipitation in the northern part of the resource area ranges from 11 to 14 inches with elevations from about 1700 to 3500 feet. Winter-summer rainfall ratios range from 40%-60% in the southern portions of the land resource unit, to 50%-50% in the central portions, to 60%-40% in the northern part of the land resource unit. As one moves from east to west in this resource area rains become slightly more unpredictable and variable with Coefficients of Variation of annual rainfall equal to 29% at Tucson and 36% at Carefree. Summer rains fall July through Sept., originate in the Gulf of Mexico, and are convective, usually brief, intense thunderstorms. Cool season moisture tends to be frontal, originating in the Pacific and Gulf of California. This winter precipitation falls in widespread storms with long duration and low intensity. Snow is rare and seldom lasts more than an hour or two. May and June are the driest months of the year. Humidity is generally very low.

Winter temperatures are mild, with very few days recording freezing temperatures in the morning. Summer temperatures are warm to hot, with several days in June and July exceeding 105 degrees F.

Both the spring and the summer growing seasons are equally important for perennial grass, forb and shrub growth. Cool and warm season annual forbs and grasses can be common in their respective seasons with above average rainfall. Perennial forage species can remain green throughout the year with available moisture.

Table 3. Representative climatic features

Frost-free period (average)	265 days
Freeze-free period (average)	0 days
Precipitation total (average)	330 mm

Influencing water features

There are no water features associated with this site.

Soil features

These are deep, young soils on loamy alluvium from mixed sources. They may or may not be calcareous, and have low shrink-swell potential. Plant-soil moisture relationships are excellent.

Soils on mapped on this site include:

SSA-668 Tucson-Avra Valley area MU's Aqua-Ag, Anthony-Ao, Estrella-Ts3, Gila-Ga, GbA, Ge, Glendale-Gd, Ge, Ge3, Grabe-Gh, GkA, Gm, GoB, Gullied Land-Gu, Pima-Pm, Trix-Tr & Ts3;

SSA-669 Eastern Pima County MU's Glendale-29 & 30;

SSA-703 Tohono O'odham area MU's Glendale-28 & Grabe-31.

Table 4. Representative soil features

Surface texture	(1) Fine sandy loam (2) Loam (3) Silt loam
Family particle size	(1) Loamy
Drainage class	Well drained
Permeability class	Moderate to moderately slow
Soil depth	152 cm
Surface fragment cover <=3"	0–10%
Surface fragment cover >3"	0–1%
Available water capacity (0-101.6cm)	14.73–27.43 cm
Calcium carbonate equivalent (0-101.6cm)	0–10%
Electrical conductivity (0-101.6cm)	0–4 mmhos/cm
Sodium adsorption ratio (0-101.6cm)	0–13
Soil reaction (1:1 water) (0-101.6cm)	7–8.2
Subsurface fragment volume <=3" (Depth not specified)	0–5%
Subsurface fragment volume >3" (Depth not specified)	0–1%

Ecological dynamics

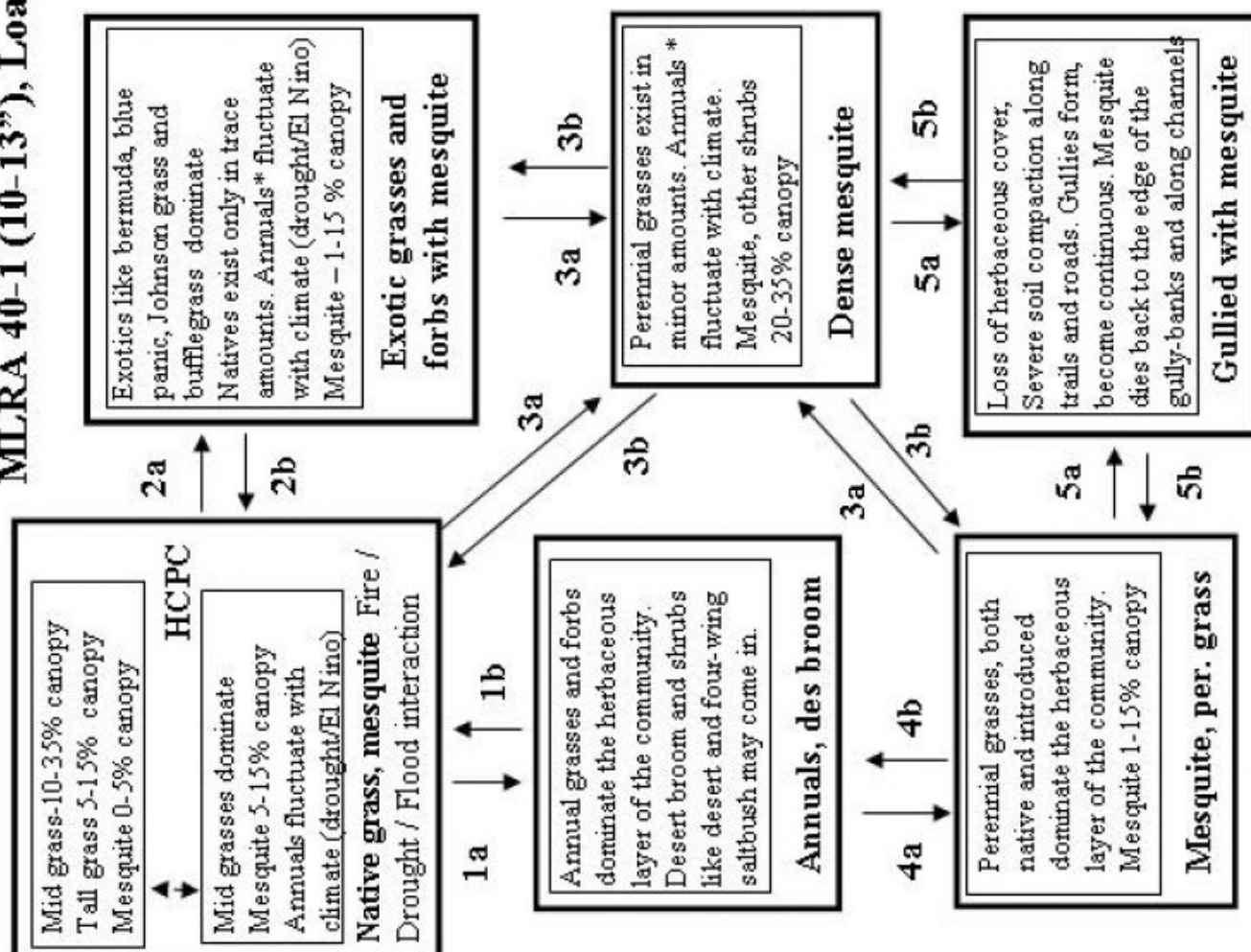
The plant communities found on an ecological site are naturally variable. Composition and production will vary with yearly conditions, location, aspect, and the natural variability of the soils. The Historical Climax Plant Community represents the natural potential plant communities found on relict or 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 fire, grazing, 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 amount shown for the group. Divide the resulting total by the total normal year production shown in the plant community description. If the 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

MLRA 40-1 (10-13"), Loamy Swale



- 1a. Cultivation and subsequent abandonment, desert broom can invade, no flooding
- 1b. Seeding and planting native grasses, mesquite, PG/NG, reinstate natural flooding regime
- 2a. CHG, introduction of a seed source. Direct or indirect seeding of exotics like bermuda, blue panic, Johnson grass and buffelgrass.
- 2b. Herbicide treatment of exotics, Seeding of native Grasses, shrubs and trees
- 3a. CHG (managing for annuals), No fires for long periods. Natural flooding regime intact or reinstated.
- 3b. PG/NG, seeding or planting of perennial grasses. mechanical brush management of mesquite, fire
- 4a. PG/NG, No fires for long periods, perennial grasses, native and introduced come in and dominate under, story. Mesquite comes in to form open canopy.
- 4b. Re-clearing or grading of the plant community
- 5a. CHG, interruption of overland flow, diversion of runoff, Severe soil compaction from traffic (livestock or vehicles) Base level changes in main stream causes down-cutting in swales and gully formation on floodplains.
- 5b. Mechanical control of rills and gullies with dams, dikes gully plugs (gabions, etc.) and with PG/NG.

CHG - continuous heavy grazing
 PG/NG - proper grazing, no grazing
 Other shrubs - whitethorn, greythorn, wolfberry

*Native annuals dominant, may be patches of some non-natives

Figure 4. State and Transition model, Loamy swale 10-13" pz.

State 1

Historical Climax Plant Community

Community 1.1

Historical Climax Plant Community

The potential plant community on this site was a mixture of desert trees and shrubs with a midgrass understory. The aspect is savannah. With continuous heavy grazing, perennial midgrasses are removed from the plant community. When the grass cover is depleted the site is extremely susceptible to gully erosion. Mesquite, whitethorn acacia and creosotebush can increase quickly to dominate the plant community with heavy use and erosion. Base level changes in large watersheds can lead to eventual gullying of the site. With severe erosion the effectiveness of flooding is greatly reduced as is the site's ability to produce vegetation.

Table 5. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Grass/Grasslike	251	1121	1737
Forb	12	224	527
Tree	112	224	336
Shrub/Vine	12	123	247
Total	387	1692	2847

Table 6. Soil surface cover

Tree basal cover	0-1%
Shrub/vine/liana basal cover	0-1%
Grass/grasslike basal cover	8-30%
Forb basal cover	1-2%
Non-vascular plants	0%
Biological crusts	5-25%
Litter	30-70%
Surface fragments >0.25" and <=3"	0-5%
Surface fragments >3"	0-1%
Bedrock	0%
Water	0%
Bare ground	10-50%

Table 7. Canopy structure (% cover)

Height Above Ground (M)	Tree	Shrub/Vine	Grass/ Grasslike	Forb
<0.15	—	—	1-5%	0-5%
>0.15 <= 0.3	—	—	5-25%	1-5%
>0.3 <= 0.6	—	0-1%	15-25%	0-15%
>0.6 <= 1.4	—	1-5%	1-20%	0-15%
>1.4 <= 4	1-5%	0-10%	0-5%	—
>4 <= 12	1-15%	—	—	—
>12 <= 24	—	—	—	—
>24 <= 37	—	—	—	—
>37	—	—	—	—

Figure 6. Plant community growth curve (percent production by month). AZ4012, 40.1 10-13" p.z. bottom sites. Growth begins in the late winter, most growth occurs in the summer..

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	2	8	10	10	10	15	20	15	5	5	0

State 2

Annuals and desert broom

Community 2.1

Annuals and desert broom

This state occurs after clearing for irrigation and subsequent abandonment. Early stages of plant succession lead to dominance by annual forbs and grasses (both native and non-native). Tumbleweed (Russian thistle) will persist with continued disturbance like disking. Desert broom can invade and may dominate the upper layer of the plant community. This state will persist for several years before other shrubs and desert trees come in and assume dominance. It will persist for long periods of time with continued disturbance. Natural flooding is reduced or eliminated by dikes, ditches and levees that were built to protect irrigated fields.

State 3

Mesquite, grass and shrubs

Community 3.1

Mesquite, grass and shrubs

This state will result from long term rest of areas that were cleared and then abandoned. Without disturbance for 30 or 40 years mesquite will come in with other shrubs like saltbush and whitethorn acacia and form an open overstory. Perennial grasses, both native and non-native will dominate the understory especially in areas where water accumulates; the bottom ends of fields, furrows or borders. Annual forbs and grasses (both native and exotic) will fluctuate with climate. This appears to be a stable community without fire or other disturbance like continuous grazing. Usually water control features (dikes, ditches) are left intact and natural flooding of these areas does not occur.

State 4

Exotic perennial grasses with mesquite

Community 4.1

Exotic perennial grasses with mesquite

This state occurs where non-native perennial grasses like bermuda, blue panic, Johnson grass, lovegrass and buffelgrass have been introduced or actually seeded on the site. These species dominate the under-story with mesquite in the over-story. In some areas these species were seeded on abandoned farmland to control weeds and erosion and persist with scattered mesquite.

State 5

Dense mesquite

Community 5.1

Dense mesquite

This state occurs where mesquite has increased in the presence of continuous grazing. Mesquite forms an impenetrable thicket and is shrubby in stature. This can also occur on abandoned farmland where large floods have broken through the old dikes and deposited mesquite seed, organic debris and soil across large areas. The resulting stands of mesquite can be extremely dense.

State 6

Eroded

Community 6.1

Eroded

This state occurs where the site has been gullied. Runoff water from adjacent uplands no longer contributes to flooding of the site and is quickly drained off by deep gullies. Base level changes in large stream systems can contribute to gully formation in areas of this site which are tributary. Loss of herbaceous cover and soil compaction and trailing caused by livestock and roads can lead to gully formation on the site.

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 Mid Grasses			112–448	
	whiplash pappusgrass	PAVA2	<i>Pappophorum vaginatum</i>	28–336	–
	Arizona cottontop	DICA8	<i>Digitaria californica</i>	0–112	–
	bush muhly	MUPO2	<i>Muhlenbergia porteri</i>	28–112	–
	plains bristlegrass	SEVU2	<i>Setaria vulpiseta</i>	0–56	–
	spike dropseed	SPCO4	<i>Sporobolus contractus</i>	0–56	–
2	Dominant sod grass			112–448	
	vine mesquite	PAOB	<i>Panicum obtusum</i>	112–448	–
3	Misc perennial grasses			1–112	
	purple threeawn	ARPU9	<i>Aristida purpurea</i>	0–28	–
	Parish's threeawn	ARPUP5	<i>Aristida purpurea</i> var. <i>parishii</i>	0–28	–
	spidergrass	ARTE3	<i>Aristida ternipes</i>	1–28	–
	spidergrass	ARTEG	<i>Aristida ternipes</i> var. <i>gentilis</i>	0–22	–
	cane bluestem	BOBA3	<i>Bothriochloa barbinodis</i>	0–22	–
	sideoats grama	BOCU	<i>Bouteloua curtipendula</i>	0–22	–
	tobosagrass	PLMU3	<i>Pleuraphis mutica</i>	0–22	–
	false Rhodes grass	TRCR9	<i>Trichloris crinita</i>	0–22	–
	slim tridens	TRMU	<i>Tridens muticus</i>	0–6	–
	big galleta	PLRI3	<i>Pleuraphis rigida</i>	0–6	–
	large-spike bristlegrass	SEMA5	<i>Setaria macrostachya</i>	0–6	–
	sand dropseed	SPCR	<i>Sporobolus cryptandrus</i>	0–6	–
	black grama	BOER4	<i>Bouteloua eriopoda</i>	0–6	–
	tanglehead	HECO10	<i>Heteropogon contortus</i>	0–6	–
	Santa Rita threeawn	ARCAG	<i>Aristida californica</i> var. <i>glabrata</i>	0–6	–
	Indian ricegrass	ACHY	<i>Achnatherum hymenoides</i>	0–3	–
	giant dropseed	SPGI	<i>Sporobolus giganteus</i>	0–3	–
	low woollygrass	DAPU7	<i>Dasyochloa pulchella</i>	0–2	–
	squirreltail	ELELE	<i>Elymus elymoides</i> ssp. <i>elymoides</i>	0–1	–
	mesa dropseed	SPFL2	<i>Sporobolus flexuosus</i>	0–1	–
4	Tall grass			1–280	
	big sacaton	SPWR2	<i>Sporobolus wrightii</i>	1–280	–
5	Annual grasses			25–448	

	Rothrock's grama	BORO2	<i>Bouteloua rothrockii</i>	22–224	–
	feather fingergrass	CHV14	<i>Chloris virgata</i>	1–112	–
	mucronate sprangletop	LEPAB	<i>Leptochloa panicea</i> ssp. <i>brachiata</i>	0–112	–
	Mexican panicgrass	PAHI5	<i>Panicum hirticaule</i>	0–112	–
	sixweeks fescue	VUOC	<i>Vulpia octoflora</i>	0–56	–
	Mexican sprangletop	LEFUU	<i>Leptochloa fusca</i> ssp. <i>uninervia</i>	0–56	–
	sticky sprangletop	LEVI5	<i>Leptochloa viscida</i>	0–56	–
	canyon cupgrass	ERLE7	<i>Eriochloa lemmonii</i>	0–56	–
	Arizona brome	BRAR4	<i>Bromus arizonicus</i>	0–56	–
	prairie threeawn	AROL	<i>Aristida oligantha</i>	1–56	–
	Bigelow's bluegrass	POBI	<i>Poa bigelovii</i>	0–34	–
	needle grama	BOAR	<i>Bouteloua aristidoides</i>	0–28	–
	sixweeks grama	BOBA2	<i>Bouteloua barbata</i>	0–28	–
	Parry's grama	BOPA2	<i>Bouteloua parryi</i>	0–28	–
	desert lovegrass	ERPEM	<i>Eragrostis pectinacea</i> var. <i>miserrima</i>	0–28	–
	tufted lovegrass	ERPEP2	<i>Eragrostis pectinacea</i> var. <i>pectinacea</i>	0–28	–
	bearded cupgrass	ERAR5	<i>Eriochloa aristata</i>	0–28	–
	sixweeks threeawn	ARAD	<i>Aristida adscensionis</i>	0–28	–
	Arizona signalgrass	URAR	<i>Urochloa arizonica</i>	0–22	–
	delicate muhly	MUFR	<i>Muhlenbergia fragilis</i>	0–6	–
	littleseed muhly	MUMI	<i>Muhlenbergia microsperma</i>	0–6	–
	witchgrass	PACA6	<i>Panicum capillare</i>	0–6	–
	Eastwood fescue	VUMIC	<i>Vulpia microstachys</i> var. <i>ciliata</i>	0–2	–
	bristlegrass	SETAR	<i>Setaria</i>	0–2	–

Forb

6	Parasites			1–22	
	mesquite mistletoe	PHCA8	<i>Phoradendron californicum</i>	1–22	–
	bigseed alfalfa dodder	CUIN	<i>Cuscuta indecora</i>	0–6	–
7	Perennial forbs			6–56	
	violet wild petunia	RUNU	<i>Ruellia nudiflora</i>	1–22	–
	desert globemallow	SPAM2	<i>Sphaeralcea ambigua</i>	0–22	–
	spear globemallow	SPHA	<i>Sphaeralcea hastulata</i>	0–11	–
	spreading fleabane	ERDI4	<i>Erigeron divergens</i>	0–11	–
	Indian rushpea	HOGL2	<i>Hoffmannseggia glauca</i>	1–11	–
	fingerleaf gourd	CUDI	<i>Cucurbita digitata</i>	0–6	–
	coyote gourd	CUPA	<i>Cucurbita palmata</i>	0–6	–
	scarlet spiderling	BOCO	<i>Boerhavia coccinea</i>	0–6	–
	climbing wartclub	BOSC	<i>Boerhavia scandens</i>	0–6	–
	dwarf desertpeony	ACNA2	<i>Acourtia nana</i>	0–6	–
	weakeaf bur ragweed	AMCO3	<i>Ambrosia confertiflora</i>	0–6	–
	red-gland spurge	CHME5	<i>Chamaesyce melanadenia</i>	0–2	–
	desert marigold	BAMU	<i>Baileya multiradiata</i>	0–2	–
	Missouri gourd	CUFO	<i>Cucurbita foetidissima</i>	0–2	–

	slender janusia	JAGR	<i>Janusia gracilis</i>	0–2	–
	wishbone-bush	MILAV	<i>Mirabilis laevis</i> var. <i>villosa</i>	0–2	–
	desert tobacco	NIOBO	<i>Nicotiana obtusifolia</i> var. <i>obtusifolia</i>	0–2	–
	spreading fanpetals	SIAB	<i>Sida abutifolia</i>	0–2	–
	New Mexico fanpetals	SINE	<i>Sida neomexicana</i>	0–2	–
	silverleaf nightshade	SOEL	<i>Solanum elaeagnifolium</i>	0–2	–
	Coulter's wrinklefruit	TECO	<i>Tetraclea coulteri</i>	0–2	–
	Louisiana vetch	VILUL2	<i>Vicia ludoviciana</i> ssp. <i>ludoviciana</i>	0–2	–
	canaigre dock	RUHY	<i>Rumex hymenosepalus</i>	0–2	–
	Tumamoc globeberry	TUMA	<i>Tumamoca macdougalii</i>	0–1	–
	orange fameflower	PHAU13	<i>Phemeranthus aurantiacus</i>	0–1	–
	brownplume wirelettuce	STPA4	<i>Stephanomeria pauciflora</i>	0–1	–
	spearleaf	MAPA9	<i>Matelea parvifolia</i>	0–1	–
	lacy tansyaster	MAPIP4	<i>Machaeranthera pinnatifida</i> ssp. <i>pinnatifida</i> var. <i>pinnatifida</i>	0–1	–
	bluedicks	DICA14	<i>Dichelostemma capitatum</i>	0–1	–
	Watson's dutchman's pipe	ARWA	<i>Aristolochia watsonii</i>	0–1	–
	brownfoot	ACWR5	<i>Acourtia wrightii</i>	0–1	–
8	Annual forbs			6–448	
	carelessweed	AMPA	<i>Amaranthus palmeri</i>	1–280	–
	wheelscale saltbush	ATEL	<i>Atriplex elegans</i>	0–112	–
	Nuttall's povertyweed	MONU	<i>Monolepis nuttalliana</i>	0–112	–
	Arizona popcornflower	PLAR	<i>Plagiobothrys arizonicus</i>	0–56	–
	bristly fiddleneck	AMTE3	<i>Amsinckia tessellata</i>	0–56	–
	pitseed goosefoot	CHBE4	<i>Chenopodium berlandieri</i>	0–56	–
	western tansymustard	DEPI	<i>Descurainia pinnata</i>	1–56	–
	Gordon's bladderpod	LEGO	<i>Lesquerella gordonii</i>	0–28	–
	shaggyfruit pepperweed	LELA	<i>Lepidium lasiocarpum</i>	0–22	–
	smallflowered milkvetch	ASNU4	<i>Astragalus nuttallianus</i>	0–22	–
	Coulter's globemallow	SPCO2	<i>Sphaeralcea coulteri</i>	0–22	–
	thelypody	THELY	<i>Thelypodium</i>	0–17	–
	ivyleaf morning-glory	IPHE	<i>Ipomoea hederacea</i>	0–17	–
	tripleleaf morning-glory	IPTE5	<i>Ipomoea ternifolia</i>	0–17	–
	Arizona poppy	KAGR	<i>Kallstroemia grandiflora</i>	0–11	–
	biannual lettuce	LALU	<i>Lactuca ludoviciana</i>	0–11	–
	mesa tansyaster	MATA	<i>Machaeranthera tagetina</i>	0–11	–
	tanseyleaf tansyaster	MATA2	<i>Machaeranthera tanacetifolia</i>	0–11	–
	hyssopleaf sandmat	CHHY3	<i>Chamaesyce hyssopifolia</i>	0–11	–
	yellow tackstem	CAPA7	<i>Calycoseris parryi</i>	0–11	–
	white tackstem	CAWR	<i>Calycoseris wrightii</i>	0–11	–
	Coulter's spiderling	BOCO2	<i>Boerhavia coulteri</i>	0–11	–

	fringed amaranth	AMFI	<i>Amaranthus fimbriatus</i>	0–11	–
	woolly tidestromia	TILA2	<i>Tidestromia lanuginosa</i>	0–11	–
	New Mexico plumeseed	RANE	<i>Rafinesquia neomexicana</i>	0–11	–
	Lemmon's ragwort	SELE8	<i>Senecio lemmonii</i>	0–11	–
	desert Indianwheat	PLOV	<i>Plantago ovata</i>	0–11	–
	woolly plantain	PLPA2	<i>Plantago patagonica</i>	0–11	–
	purslane	PORTU	<i>Portulaca</i>	0–11	–
	manybristle chinchweed	PEPA2	<i>Pectis papposa</i>	0–11	–
	Arizona phacelia	PHAR13	<i>Phacelia arizonica</i>	0–11	–
	cleftleaf wildheliotrope	PHCR	<i>Phacelia crenulata</i>	0–11	–
	coastal bird's-foot trefoil	LOSAB	<i>Lotus salsuginosus</i> var. <i>brevivexillus</i>	0–11	–
	bean	PHASE	<i>Phaseolus</i>	2–10	–
	distant phacelia	PHDI	<i>Phacelia distans</i>	0–6	–
	slimjim bean	PHFI3	<i>Phaseolus filiformis</i>	0–6	–
	doubleclaw	PRPA2	<i>Proboscidea parviflora</i>	0–6	–
	California desertdandelion	MACA6	<i>Malacothrix californica</i>	0–6	–
	sleepy silene	SIAN2	<i>Silene antirrhina</i>	0–6	–
	Louisiana vetch	VILUL2	<i>Vicia ludoviciana</i> ssp. <i>ludoviciana</i>	0–6	–
	hoary bowlesia	BOIN3	<i>Bowlesia incana</i>	0–6	–
	cryptantha	CRYPT	<i>Cryptantha</i>	0–6	–
	Sonoran sandmat	CHMI7	<i>Chamaesyce micromera</i>	0–6	–
	fringed redmaids	CACI2	<i>Calandrinia ciliata</i>	0–6	–
	whitestem blazingstar	MEAL6	<i>Mentzelia albicaulis</i>	0–6	–
	American wild carrot	DAPU3	<i>Daucus pusillus</i>	0–6	–
	star gilia	GIST	<i>Gilia stellata</i>	0–6	–
	crestrib morning-glory	IPCO2	<i>Ipomoea costellata</i>	0–6	–
	redstar	IPCO3	<i>Ipomoea coccinea</i>	0–6	–
	California poppy	ESCAM	<i>Eschscholzia californica</i> ssp. <i>mexicana</i>	0–2	–
	California goldfields	LACAC2	<i>Lasthenia californica</i> ssp. <i>californica</i>	0–2	–
	New Mexico thistle	CINE	<i>Cirsium neomexicanum</i>	0–2	–
	desert thorn-apple	DADI2	<i>Datura discolor</i>	0–2	–
	pricklyburr	DAIN2	<i>Datura inoxia</i>	0–2	–
	miniature woollystar	ERDI2	<i>Eriastrum diffusum</i>	0–2	–
	buckwheat	ERIOG	<i>Eriogonum</i>	0–2	–
	California suncup	CACA32	<i>Camissonia californica</i>	0–2	–
	woollyhead neststraw	STMI2	<i>Stylocline micropoides</i>	0–2	–
	sand fringe-pod	THCU	<i>Thysanocarpus curvipes</i>	0–2	–
	hedgemustard	SISYM	<i>Sisymbrium</i>	0–2	–
	green carpetweed	MOVE	<i>Mollugo verticillata</i>	0–2	–
	desert evening primrose	OEPR	<i>Oenothera primiveris</i>	0–2	–
	Florida bellitorv	PAFL3	<i>Parietaria floridana</i>	0–2	–

	pellitory	PARIE	<i>Parietaria</i>	0–2	–
	combseed	PECTO	<i>Pectocarya</i>	0–2	–
	Mexican passionflower	PAME2	<i>Passiflora mexicana</i>	0–1	–
	bristly nama	NAHI	<i>Nama hispidum</i>	0–1	–
	slender goldenweed	MAGR10	<i>Machaeranthera gracilis</i>	0–1	–
	London rocket	SIIR	<i>Sisymbrium irio</i>	0–1	–
	Texas stork's bill	ERTE13	<i>Erodium texanum</i>	0–1	–
	Palmer's spectaclepod	DICA31	<i>Dimorphocarpa candicans</i>	0–1	–
	wedgeleaf draba	DRCU	<i>Draba cuneifolia</i>	0–1	–
	Mexican fireplant	EUHE4	<i>Euphorbia heterophylla</i>	0–1	–
	Arizona cottonrose	LOAR12	<i>Logfia arizonica</i>	0–1	–
	Lindley's silverpuffs	MILI5	<i>Microseris lindleyi</i>	0–1	–
Shrub/Vine					
9	Large shrubs			11–168	
	whitethorn acacia	ACCO2	<i>Acacia constricta</i>	2–112	–
	creosote bush	LATRT	<i>Larrea tridentata</i> var. <i>tridentata</i>	1–56	–
	fourwing saltbush	ATCA2	<i>Atriplex canescens</i>	1–28	–
	Arizona desert-thorn	LYEX	<i>Lycium exsertum</i>	0–17	–
	cattle saltbush	ATPO	<i>Atriplex polycarpa</i>	0–11	–
	spiny hackberry	CEEH	<i>Celtis ehrenbergiana</i>	0–11	–
	crucifixion thorn	CAEM4	<i>Castela emoryi</i>	0–6	–
	soaptree yucca	YUEL	<i>Yucca elata</i>	0–6	–
	lotebush	ZIOB	<i>Ziziphus obtusifolia</i>	0–6	–
	Berlandier's wolfberry	LYBE	<i>Lycium berlandieri</i>	0–6	–
	desertbroom	BASA2	<i>Baccharis sarothroides</i>	0–2	–
	desert willow	CHLI2	<i>Chilopsis linearis</i>	0–2	–
	Nevada jointfir	EPNE	<i>Ephedra nevadensis</i>	0–2	–
	ambrosia leaf bur ragweed	AMAM2	<i>Ambrosia ambrosioides</i>	0–2	–
	Thurber's desert honeysuckle	ANTH2	<i>Anisacanthus thurberi</i>	0–1	–
	longleaf jointfir	EPTR	<i>Ephedra trifurca</i>	0–1	–
10	Dominant vines			1–45	
	Drummond's clematis	CLDR	<i>Clematis drummondii</i>	0–22	–
	fringed twinevine	FUCYC	<i>Funastrum cynanchoides</i> ssp. <i>cynanchoides</i>	0–11	–
	Gila manroot	MAGI	<i>Marah gilensis</i>	0–11	–
	yellowhood	NISSO	<i>Nissolia</i>	0–6	–
	fetid passionflower	PAFO2	<i>Passiflora foetida</i>	0–6	–
	climbing arrowheads	SIGR	<i>Sicyosperma gracile</i>	0–6	–
11	Succulents			0–22	
	cactus apple	OPEN3	<i>Opuntia engelmannii</i>	0–11	–
	tulip pricklypear	OPPH	<i>Opuntia phaeacantha</i>	0–6	–
	Arizona pencil cholla	CYAR14	<i>Cylindropuntia arbuscula</i>	0–6	–
	Christmas cactus	CYLE8	<i>Cylindropuntia leptocaulis</i>	0–6	–

	staghorn cholla	CYVE3	<i>Cylindropuntia versicolor</i>	0–2	–
	dollarjoint pricklypear	OPCH	<i>Opuntia chlorotica</i>	0–2	–
	nightblooming cereus	PEGRG	<i>Peniocereus greggii</i> var. <i>greggii</i>	0–1	–
	candy barrelcactus	FEWI	<i>Ferocactus wislizeni</i>	0–1	–
	devil's cholla	GRKU	<i>Grusonia kunzei</i>	0–1	–
	walkingstick cactus	CYSP8	<i>Cylindropuntia spinosior</i>	0–1	–
	jumping cholla	CYFU10	<i>Cylindropuntia fulgida</i>	0–1	–
	buck-horn cholla	CYAC8	<i>Cylindropuntia acanthocarpa</i>	0–1	–
12	Half shrubs			0–11	
	fairyduster	CAER	<i>Calliandra eriophylla</i>	0–6	–
	snakewood	CONDA	<i>Condalia</i>	0–2	–
	alkali goldenbush	ISACA2	<i>Isocoma acradenia</i> var. <i>acradenia</i>	0–2	–
	burroweed	ISTE2	<i>Isocoma tenuisecta</i>	0–2	–
	littleleaf ratany	KRER	<i>Krameria erecta</i>	0–2	–
	white ratany	KRGR	<i>Krameria grayi</i>	0–2	–
	woolly fruit bur ragweed	AMER	<i>Ambrosia eriocentra</i>	0–2	–
	rubber rabbitbrush	ERNAG	<i>Ericameria nauseosa</i> ssp. <i>nauseosa</i> var. <i>glabrata</i>	0–2	–
	broom snakeweed	GUSA2	<i>Gutierrezia sarothrae</i>	0–1	–
	shortleaf baccharis	BABR	<i>Baccharis brachyphylla</i>	0–1	–
	Coulter's brickellbush	BRCO	<i>Brickellia coulteri</i>	0–1	–
	whitestem paperflower	PSCO2	<i>Psilostrophe cooperi</i>	0–1	–
	Mexican bladdersage	SAME	<i>Salazaria mexicana</i>	0–1	–
	American threefold	TRCA8	<i>Trixis californica</i>	0–1	–
	toothleaf goldeneye	VIDE3	<i>Viguiera dentata</i>	0–1	–
	brittlebush	ENFA	<i>Encelia farinosa</i>	0–1	–
	buckwheat	ERIOG	<i>Eriogonum</i>	0–1	–
	rayless goldenhead	ACSP	<i>Acamptopappus sphaerocephalus</i>	0–1	–
	triangle bur ragweed	AMDE4	<i>Ambrosia deltoidea</i>	0–1	–
Tree					
13	Trees			112–336	
	velvet mesquite	PRVE	<i>Prosopis velutina</i>	112–336	–
	catclaw acacia	ACGR	<i>Acacia greggii</i>	0–56	–
	Jerusalem thorn	PAAC3	<i>Parkinsonia aculeata</i>	0–22	–
	blue paloverde	PAFL6	<i>Parkinsonia florida</i>	0–22	–
	yellow paloverde	PAMI5	<i>Parkinsonia microphylla</i>	0–22	–
	desert ironwood	OLTE	<i>Olneya tesota</i>	0–11	–
	Joshua tree	YUBR	<i>Yucca brevifolia</i>	0–2	–

Animal community

The plant community on this site is suitable for grazing by all classes of cattle. Because of water availability in the rainy seasons, long green seasons, shade and easy accessibility, this site is often overused. Large areas should be fenced and managed separately from adjacent upland sites. Grazing should be avoided during the summer flood season to avoid damage by trampling the muddy soils and because heat, humidity and insects reduce livestock

performance. The plant community provides adequate nutrition for livestock throughout the year.

Free water is available in the summer rainy season in natural charcos and discontinuous gullies. Forage diversity, shade and cover are very good and make this site home to a great variety of wildlife species including the larger desert mammals. Water developments which prolong the availability of free water are very important to the larger wildlife species on the site.

Hydrological functions

Medium to heavy textured soils and flat slopes make this site a fair producer of runoff. The site receives extra water in the form of runoff from adjacent uplands and watershed areas.

Recreational uses

Hunting, camping, hiking, birdwatching, photography, horseback riding.

Wood products

Good supplies of mesquite for firewood.

Other products

Mesquite beans and cactus fruits

Inventory data references

Range 417s include 4 in good condition.

Type locality

Location 1: Pima County, AZ	
Township/Range/Section	T16S R15E S14
General legal description	Tucson FO - Pima County Fairgrounds
Location 2: Pima County, AZ	
Township/Range/Section	T20S R5E S23
General legal description	Sells FO - Chutum Vaya Assoc. Community Pastures
Location 3: Pima County, AZ	
Township/Range/Section	T14S R11E S31
General legal description	La Tortuga Ranch, In Conservation Ditch Pasture at KA 1. Ungrazed 7 years

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)	Dave Womack, Dan Robinett, Emilio Carrillo
Contact for lead author	NRCS Tucson Area Office
Date	03/08/2005
Approved by	S. Cassady
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

Indicators

1. **Number and extent of rills:** Rills are present on this site but are well vegetated and not eroding.

2. **Presence of water flow patterns:** Uncommon; probably cover no more than 5% of area; very short and discontinuous, 1-2 terracetes.

3. **Number and height of erosional pedestals or terracettes:** Slope is 0-1% and not conducive to forming pedestals and terracettes.

4. **Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):** 5-15%

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

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

7. **Amount of litter movement (describe size and distance expected to travel):** All litter size classes staying in place, occasionally transported in flow paths.

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 site.

9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** WEak thin platy to weak granular to moderate subangular block; color is 7.5-10YR6/4 dry, .5-10YR4/4 moist; thickness to 4 inches.

10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:** Canopy 60-70%; asa 15-25%, litter 15%: 80% canopy cover is perennial grasses, 2-5% forbs, 15% shrubs and trees.

11. **Presence and thickness of compaction layer (usually none; describe soil profile features which may be mistaken for compaction on this site):** None

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: perennial mid grasses > trees & shrubs > short grasses > grasslike species > perennial forbs > annual grasses and forbs.

Sub-dominant:

Other:

Additional:

13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):** 50% basal area lost on perennial grasses.

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):** 346 lbs/ac unfavorable precipitation, 1510 lbs/ac normal precipitation, 2540 lbs/ac favorable precipitation.

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:** mesquite, whitethorn, creosote, Bermuda grass, Johnson grass, blue panic, buffleggrass, yellow bluestem, London Rocket, malta starthistle, cheeseweed, cocklebur

17. **Perennial plant reproductive capability:** Nt affected even following several years of prolonged drought period for region.
