Ecological site R040XA117AZ
Sandy Loam Upland, Deep 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.

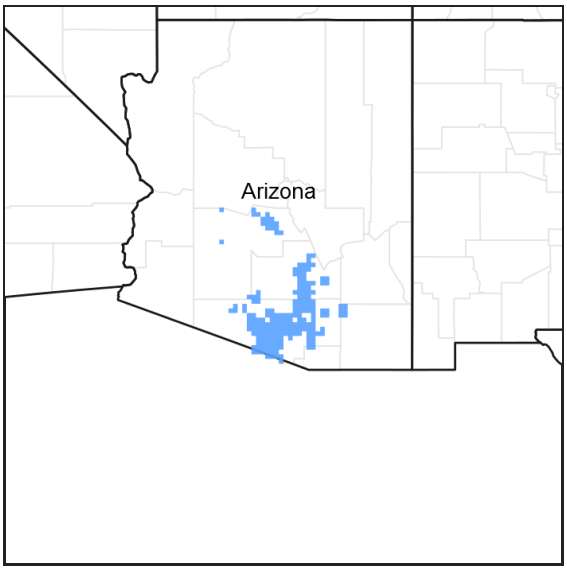

Figure 1. Mapped extent

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

R040XA105AZ	**Shallow Hills 10"-13" p.z.**
R040XA115AZ	**Sandy Wash 10"-13" p.z.**
R040XA118AZ	**Sandy Loam Upland 10"-13" p.z.**
R040XA121AZ	**Granitic Upland 10"-13" p.z.**

Similar sites

R041XB215AZ	**Sandy Loam Upland 8-12" p.z.**
R041XC318AZ	**Sandy Loam 12-16" p.z. Deep**

Table 1. Dominant plant species

Tree	(1) *Parkinsonia microphylla* (2) *Prosopis velutina*
Shrub	(1) *Isocoma tenuisecta* (2) *Ambrosia deltoidea*
Herbaceous	(1) *Muhlenbergia porteri* (2) *Aristida californica Var. glabrata*

Physiographic features

This site occurs in the upper elevations of the Sonoran Desert in southern Arizona. It occurs on fan terraces and high stream terraces.

Table 2. Representative physiographic features

Landforms	(1) Fan (2) Terrace (3) Stream terrace
Flooding frequency	None
Ponding frequency	None
Elevation	549–1,006 m
Slope	1–8%
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 soils which have formed in recent sandy alluvium of mixed origin. They are sandy loam throughout at least to moderate depths (30 inches). Plant-soil moisture relationships are good. They are non-calcareous in the surface ten inches.
Soils mapped on this site include:
SSA-645 Aguila-Carefree area MU Anthony-6;
SSA-659 Western Pinal County MU Paharito-35;
SSA661 Eastern Pinal-Southern Gila Counties MU's Hayhook-455 & 515;
SSA-666 Northwest Cochise County MU's Brazito-467 & Yturbide-487;
SSA-668 Tucson-Avra Valley area MU's Comoro-CnB, Cowan-Ct, Anthony-VcB, Vinton-Vt;
SSA-669 Eastern Pima County MU's Hayhook-35 & 36;
SSA-703 Tohono O'odham area MU's Hayhook-6 & 35 and Soledad-56.

Table 4. Representative soil features

Surface texture	(1) Sandy loam (2) Gravelly sandy loam (3) Loamy sand
Family particle size	(1) Loamy
Drainage class	Well drained
Permeability class	Moderately rapid to moderate
Soil depth	152 cm
Surface fragment cover <=3"	10–50%
Surface fragment cover >3"	0–5%
Available water capacity (0-101.6cm)	13.21–18.8 cm
Calcium carbonate equivalent (0-101.6cm)	0–10%
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)	6.6–7.8
Subsurface fragment volume <=3" (Depth not specified)	5–40%
Subsurface fragment volume >3" (Depth not specified)	0–5%

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

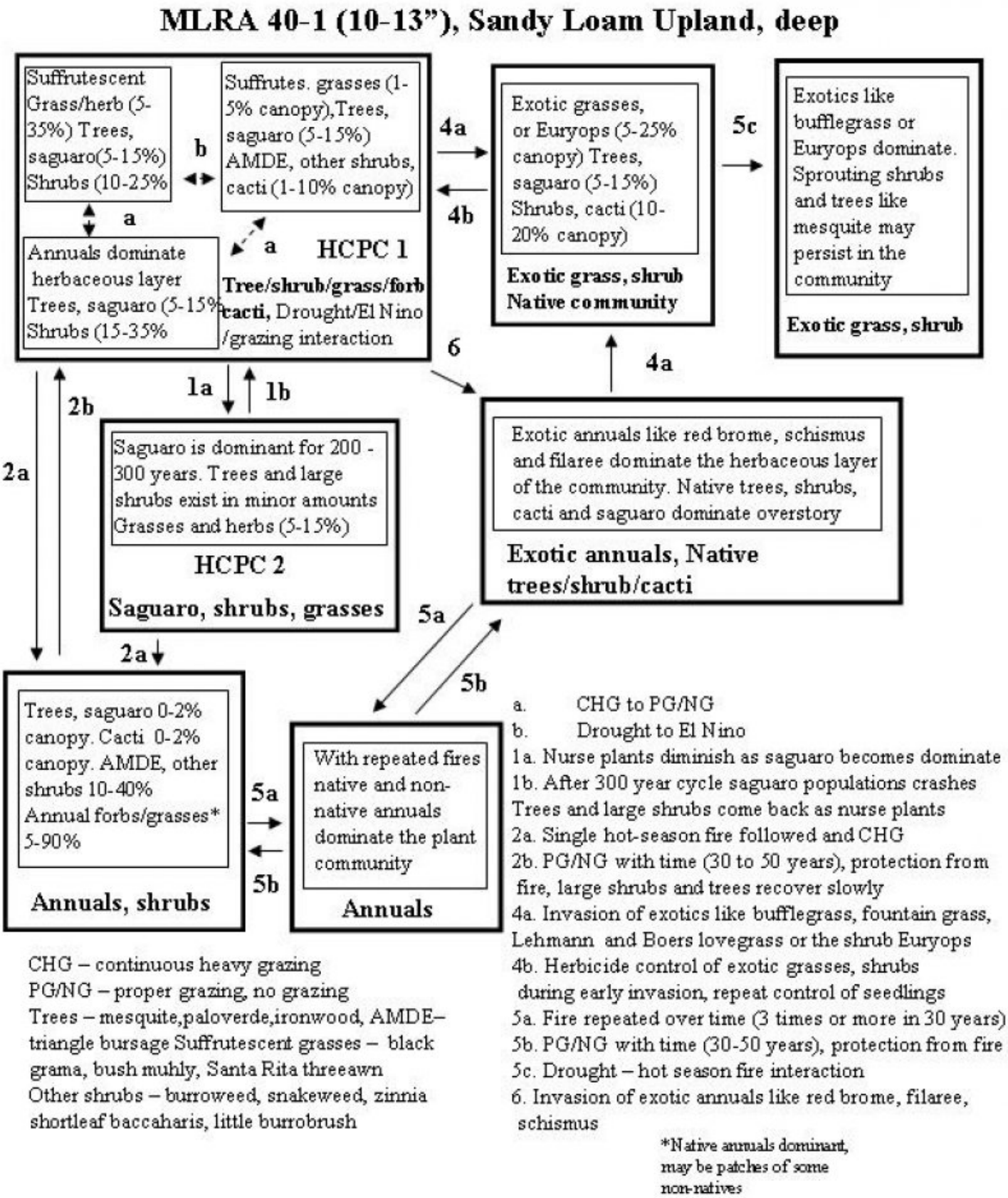

Figure 4. State and Transition, Sandyloam upland, deep 10-13

State 1
Historical Climax Plant Community

Community 1.1
Historical Climax Plant Community

The potential plant community is an open stand of desert trees and cacti with a grassy understory. The major perennial grass species tend to be well dispersed throughout the plant community. The aspect is savannah. With continuous grazing, perennial grasses and suffrutescent forbs are removed from the plant community and shrubs like burroweed and triangle bursage increase to dominate the understory. Trees grow to near maximum size on these deep coarse textured soils. A tree canopy of 5% to 10% is important on the site to keep diversity in the plant community. The potential of the site to produce grass is reduced as tree cover exceeds 15%. In severe drought the cover of perennial grasses and herbs as well as bursage and burroweed can be greatly reduced in the plant community. Recovery can go back to perennial grasses and herbs if good summer rains follow drought. Recovery can go back to the half shrubs if good cool season rains follow the drought. Even with poor plant cover these soils produce very little runoff and have very low erosion rates. Staghorn and jumping cholla can increase with heavy grazing or increases can be episodic due to climate. Stand life spans range from 40-60 years without reproduction.

Table 5. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Grass/Grasslike	50	392	729
Forb	6	112	308
Tree	84	168	224
Shrub/Vine	22	135	185
Total	**162**	**807**	**1446**

Table 6. Soil surface cover

Tree basal cover	0-1%
Shrub/vine/liana basal cover	1-4%
Grass/grasslike basal cover	1-6%
Forb basal cover	0-1%
Non-vascular plants	0%
Biological crusts	1-10%
Litter	10-80%
Surface fragments >0.25" and <=3"	0-40%
Surface fragments >3"	0-5%
Bedrock	0%
Water	0%
Bare ground	10-85%

Table 7. Canopy structure (% cover)

Height Above Ground (M)	Tree	Shrub/Vine	Grass/ Grasslike	Forb
<0.15	–	0-1%	0-35%	0-15%
>0.15 <= 0.3	–	0-5%	1-20%	0-10%
>0.3 <= 0.6	–	0-10%	1-10%	0-1%
>0.6 <= 1.4	0-1%	0-5%	0-5%	0-1%
>1.4 <= 4	5-10%	–	–	–
>4 <= 12	0-2%	–	–	–
>12 <= 24	–	–	–	–
>24 <= 37	–	–	–	–
>37	–	–	–	–

Figure 6. Plant community growth curve (percent production by month). AZ4013, 40.1 10-13" p.z. other sites. Growth begins in the late winter, goes semi-dormant in the drought period of late May through early July, growth continues in the summer through early fall..

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

State 2
Exotic perennial grasses with natives

Community 2.1
Exotic perennial grasses with natives

This community occurs where bufflegrass, Lehmann lovegrass, Boer lovegrass, natal grass or fountain grass invade the native plant community. These species occupy the niches of perennial grasses like bush muhly, Santa Rita threeawn and low shrubs like burroweed and triangle bursage.

State 3
Exotic perennial grasses and fire

Community 3.1
Exotic perennial grasses and fire

This community occurs where a native plant community that has been invaded by bufflegrass, Lovegrasses or fountain grass has burned one or more times. Increasing amounts of exotic perennial grasses leads to more uniform fine fuels. In areas adjacent to roads and urban areas the risk of repeated fires will increase. As fire frequency increases the dominance of the exotic grasses increase.

State 4
Exotic annuals

Community 4.1
Exotic annuals

This plant community occurs where the native plant community has been invaded by annuals like schismus, red brome and filaree. These species occupy the niche of the native winter annual forbs and grasses. The exotic annual grasses will fluctuate from nearly nothing in a dry winter to dominance of the understory plant community in a El Nino winter.

State 5
Annuals, half shrubs and fire

Community 5.1
Annuals, half shrubs and fire

This plant community occurs as a result of a single hot season fire. Paloverde, ironwood, cacti and saguaro can be severely impacted and may take long periods of time (30-50 years) to recover to pre-fire levels. Perennial and annual grasses and forbs dominate the community for some time until shrubs like bursage can recover. Perennial grasses can recover rapidly if grazing pressure is low and summer rains are sufficient. This plant community can produce enough herbaceous fuel from native species of grasses and / or forbs to carry fire in El Nino years or after unusually wet summers. The natural incidence of fire in this MLRA is very low and fires are much more common from man-made ignitions. Areas of the site close to urban zones or along heavily travelled roads and highways will experience a higher rate of fires.

State 6

Annuals and fire

Community 6.1
Annuals and fire

This plant community occurs where a native plant community has burned repeatedly. As fires become more frequent the native trees, shrubs and succulents are removed from the plant community and annuals becomes dominant. In areas of the site near urban areas and along heavily travelled roads this will be a more common occurence due to an increased source of ignitions. This can occur both in areas with only native annuals species present as well as those which have been invaded by schismus and red brome.

State 7
HCPC 2 - Saguaro state

Community 7.1
HCPC 2 - Saguaro state

There is a 300 year cycle on this site that swings between dominance of native trees and large shrubs (that serve as nurse plants) and mature saguaro forest. Saguaros establish wholesale in very favorable years (El Nino years like 1983) only in the presence of plentiful nurse plants like paloverde, ironwood, mesquite, wolfberry, creosote and jojoba. As saguaro plants top their nurse plants (40-60 years) the trees and shrubs begin to die. Saguaro stands reach maturity at 150 to 200 years and begin to diminish over the next 100 years as the large shrubs and trees come back into the plant community.

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 suffrutescent grasses**			34–168	
	bush muhly	MUPO2	*Muhlenbergia porteri*	17–112	–
	Santa Rita threeawn	ARCAG	*Aristida californica var. glabrata*	6–84	–
2	**Dominant mid grasses**			6–112	
	spidergrass	ARTE3	*Aristida ternipes*	0–56	–
	Arizona cottontop	DICA8	*Digitaria californica*	1–56	–
	tanglehead	HECO10	*Heteropogon contortus*	0–22	–
	big galleta	PLRI3	*Pleuraphis rigida*	0–22	–
	spike dropseed	SPCO4	*Sporobolus contractus*	1–22	–
	spidergrass	ARTEG	*Aristida ternipes var. gentilis*	0–22	–
3	**Short lived perennial grasses**			6–112	
	Rothrock's grama	BORO2	*Bouteloua rothrockii*	6–112	–
	Parry's grama	BOPA2	*Bouteloua parryi*	0–56	–
	slender grama	BORE2	*Bouteloua repens*	0–34	–
4	**Miscellaneous perennial grasses**			0–17	
	black grama	BOER4	*Bouteloua eriopoda*	0–11	–
	whiplash pappusgrass	PAVA2	*Pappophorum vaginatum*	0–11	–
	Parish's threeawn	ARPUP5	*Aristida purpurea var. parishii*	0–6	–
	purple threeawn	ARPU9	*Aristida purpurea*	0–6	–
	sand dropseed	SPCR	*Sporobolus cryptandrus*	0–6	–
	mesa dropseed	SPFL2	*Sporobolus flexuosus*	0–2	–

	desert needlegrass	ACSP12	*Achnatherum speciosum*	0–2	–
	cane bluestem	BOBA3	*Bothriochloa barbinodis*	0–2	–
	sideoats grama	BOCU	*Bouteloua curtipendula*	0–2	–
	plains bristlegrass	SEVU2	*Setaria vulpiseta*	0–2	–
	low woollygrass	DAPU7	*Dasyochloa pulchella*	0–2	–
	squirreltail	ELELE	*Elymus elymoides ssp. elymoides*	0–1	–
	nineawn pappusgrass	ENDE	*Enneapogon desvauxii*	0–1	–
	blue threeawn	ARPUN	*Aristida purpurea var. nealleyi*	0–1	–
5	**Annual grasses**			6–336	
	needle grama	BOAR	*Bouteloua aristidoides*	2–224	–
	prairie threeawn	AROL	*Aristida oligantha*	1–56	–
	Mexican panicgrass	PAHI5	*Panicum hirticaule*	0–56	–
	sixweeks grama	BOBA2	*Bouteloua barbata*	0–28	–
	sixweeks threeawn	ARAD	*Aristida adscensionis*	0–22	–
	desert lovegrass	ERPEM	*Eragrostis pectinacea var. miserrima*	0–22	–
	tufted lovegrass	ERPEP2	*Eragrostis pectinacea var. pectinacea*	0–22	–
	mucronate sprangeltop	LEPAB	*Leptochloa panicea ssp. brachiata*	0–22	–
	sixweeks fescue	VUOC	*Vulpia octoflora*	0–22	–
	Bigelow's bluegrass	POBI	*Poa bigelovii*	0–11	–
	witchgrass	PACA6	*Panicum capillare*	0–6	–
	feather fingergrass	CHVI4	*Chloris virgata*	0–6	–
	canyon cupgrass	ERLE7	*Eriochloa lemmonii*	0–6	–
	Arizona brome	BRAR4	*Bromus arizonicus*	0–3	–
	Mexican sprangletop	LEFUU	*Leptochloa fusca ssp. uninervia*	0–2	–
	delicate muhly	MUFR	*Muhlenbergia fragilis*	0–2	–
	littleseed muhly	MUMI	*Muhlenbergia microsperma*	0–2	–
	Madagascar dropseed	SPPY2	*Sporobolus pyramidatus*	0–2	–
	Arizona signalgrass	URAR	*Urochloa arizonica*	0–2	–
Forb					
6	**Perennial forbs**			2–28	
	lacy tansyaster	MAPIP4	*Machaeranthera pinnatifida ssp. pinnatifida var. pinnatifida*	1–11	–
	desert globemallow	SPAM2	*Sphaeralcea ambigua*	1–11	–
	brownplume wirelettuce	STPA4	*Stephanomeria pauciflora*	0–6	–
	canaigre dock	RUHY	*Rumex hymenosepalus*	0–6	–
	slender poreleaf	POGR5	*Porophyllum gracile*	0–2	–
	smooth threadleaf ragwort	SEFLM	*Senecio flaccidus var. monoensis*	0–2	–
	San Felipe dogweed	ADPO	*Adenophyllum porophylloides*	0–2	–
	slender janusia	JAGR	*Janusia gracilis*	0–2	–
	trailing windmills	ALIN	*Allionia incarnata*	0–1	–
	weakleaf bur ragweed	AMCO3	*Ambrosia confertiflora*	0–1	–
	New Mexico silverbush	ARNE2	*Argythamnia neomexicana*	0–1	–
	Yuma silverbush	ARSE7	*Argythamnia serrata*	0–1	–

	Watson's dutchman's pipe	ARWA	*Aristolochia watsonii*	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	–
	whitemargin sandmat	CHAL11	*Chamaesyce albomarginata*	0–1	–
	whitemouth dayflower	COER	*Commelina erecta*	0–1	–
	leatherweed	CRPOP	*Croton pottsii var. pottsii*	0–1	–
	fingerleaf gourd	CUDI	*Cucurbita digitata*	0–1	–
	coyote gourd	CUPA	*Cucurbita palmata*	0–1	–
	wild dwarf morning-glory	EVAR	*Evolvulus arizonicus*	0–1	–
	spreading fanpetals	SIAB	*Sida abutifolia*	0–1	–
	silverleaf nightshade	SOEL	*Solanum elaeagnifolium*	0–1	–
	Coulter's wrinklefruit	TECO	*Tetraclea coulteri*	0–1	–
	shrubby purslane	POSU3	*Portulaca suffrutescens*	0–1	–
	twinleaf senna	SEBA3	*Senna bauhinioides*	0–1	–
	Coues' cassia	SECO10	*Senna covesii*	0–1	–
	wishbone-bush	MILAV	*Mirabilis laevis var. villosa*	0–1	–
	orange fameflower	PHAU13	*Phemeranthus aurantiacus*	0–1	–
	dwarf desertpeony	ACNA2	*Acourtia nana*	0–1	–
	brownfoot	ACWR5	*Acourtia wrightii*	0–1	–
7	**Annual forbs**			1–280	
	bristly fiddleneck	AMTE3	*Amsinckia tessellata*	0–84	–
	California poppy	ESCAM	*Eschscholzia californica ssp. mexicana*	0–56	–
	combseed	PECTO	*Pectocarya*	0–56	–
	Coulter's spiderling	BOCO2	*Boerhavia coulteri*	0–34	–
	Coulter's lupine	LUSP2	*Lupinus sparsiflorus*	0–28	–
	Arizona phacelia	PHAR13	*Phacelia arizonica*	0–28	–
	woolly tidestromia	TILA2	*Tidestromia lanuginosa*	0–28	–
	shaggyfruit pepperweed	LELA	*Lepidium lasiocarpum*	0–22	–
	Arizona poppy	KAGR	*Kallstroemia grandiflora*	0–22	–
	western tansymustard	DEPI	*Descurainia pinnata*	0–17	–
	miniature woollystar	ERDI2	*Eriastrum diffusum*	0–17	–
	desert Indianwheat	PLOV	*Plantago ovata*	0–17	–
	Coulter's globemallow	SPCO2	*Sphaeralcea coulteri*	0–11	–
	buckwheat	ERIOG	*Eriogonum*	0–11	–
	cryptantha	CRYPT	*Cryptantha*	0–11	–
	Tucson Mountain spiderling	BOME	*Boerhavia megaptera*	0–11	–
	American wild carrot	DAPU3	*Daucus pusillus*	0–11	–
	milkvetch	ASTRA	*Astragalus*	0–11	–
	carelessweed	AMPA	*Amaranthus palmeri*	0–11	–

	wheelscale saltbush	ATEL	*Atriplex elegans*	0–6	–
	Gordon's bladderpod	LEGO	*Lesquerella gordonii*	0–6	–
	Arizona lupine	LUAR4	*Lupinus arizonicus*	0–6	–
	slender goldenweed	MAGR10	*Machaeranthera gracilis*	0–6	–
	mesa tansyaster	MATA	*Machaeranthera tagetina*	0–6	–
	tanseyleaf tansyaster	MATA2	*Machaeranthera tanacetifolia*	0–6	–
	pitseed goosefoot	CHBE4	*Chenopodium berlandieri*	0–6	–
	spreading fleabane	ERDI4	*Erigeron divergens*	0–6	–
	Arizona popcornflower	PLAR	*Plagiobothrys arizonicus*	0–6	–
	hoary bowlesia	BOIN3	*Bowlesia incana*	0–3	–
	green carpetweed	MOVE	*Mollugo verticillata*	0–3	–
	Texas stork's bill	ERTE13	*Erodium texanum*	0–3	–
	Mexican fireplant	EUHE4	*Euphorbia heterophylla*	0–2	–
	hairy desertsunflower	GECA2	*Geraea canescens*	0–2	–
	star gilia	GIST	*Gilia stellata*	0–2	–
	evening primrose	OENOT	*Oenothera*	0–2	–
	Florida pellitory	PAFL3	*Parietaria floridana*	0–2	–
	coastal bird's-foot trefoil	LOSA	*Lotus salsuginosus*	0–2	–
	New Mexico thistle	CINE	*Cirsium neomexicanum*	0–2	–
	hyssopleaf sandmat	CHHY3	*Chamaesyce hyssopifolia*	0–2	–
	common woolly sunflower	ERLA6	*Eriophyllum lanatum*	0–2	–
	Palmer's spectaclepod	DICA31	*Dimorphocarpa candicans*	0–2	–
	sand fringepod	THCU	*Thysanocarpus curvipes*	0–2	–
	purslane	PORTU	*Portulaca*	0–2	–
	doubleclaw	PRPA2	*Proboscidea parviflora*	0–2	–
	sleepy silene	SIAN2	*Silene antirrhina*	0–2	–
	manybristle chinchweed	PEPA2	*Pectis papposa*	0–2	–
	slimjim bean	PHFI3	*Phaseolus filiformis*	0–1	–
	lyreleaf jewelflower	STCAA	*Streptanthus carinatus ssp. arizonicus*	0–1	–
	pricklyburr	DAIN2	*Datura inoxia*	0–1	–
	sensitive partridge pea	CHNI2	*Chamaecrista nictitans*	0–1	–
	prostrate sandmat	CHPR6	*Chamaesyce prostrata*	0–1	–
	Esteve's pincushion	CHST	*Chaenactis stevioides*	0–1	–
	Arizona cottonrose	LOAR12	*Logfia arizonica*	0–1	–
Shrub/Vine					
8	**Dominant half shrubs**			6–56	
	triangle bur ragweed	AMDE4	*Ambrosia deltoidea*	1–56	–
	burroweed	ISTE2	*Isocoma tenuisecta*	1–39	–
9	**Large shrubs**			11–45	
	spiny hackberry	CEEH	*Celtis ehrenbergiana*	6–22	–
	catclaw acacia	ACGR	*Acacia greggii*	0–6	–
	fourwing saltbush	ATCA2	*Atriplex canescens*	0–6	–
	Berlandier's wolfberry	LYBE	*Lycium berlandieri*	1–6	–

	Berlandier's wolfberry	LYBE	*Lycium berlandieri*	1–3	
	soaptree yucca	YUEL	*Yucca elata*	0–6	–
	longleaf jointfir	EPTR	*Ephedra trifurca*	0–4	–
	sangre de cristo	JACA2	*Jatropha cardiophylla*	0–2	–
	creosote bush	LATR2	*Larrea tridentata*	0–2	–
	water jacket	LYAN	*Lycium andersonii*	0–2	–
	whitethorn acacia	ACCO2	*Acacia constricta*	0–2	–
	lotebush	ZIOB	*Ziziphus obtusifolia*	0–1	–
10	**Miscellaneous shrubs**			0–28	
	desert zinnia	ZIAC	*Zinnia acerosa*	1–17	–
	Thurber's penstemon	PETH3	*Penstemon thurberi*	0–11	–
	shortleaf baccharis	BABR	*Baccharis brachyphylla*	0–11	–
	brittlebush	ENFA	*Encelia farinosa*	0–11	–
	Parish's goldeneye	VIPA14	*Viguiera parishii*	0–11	–
	broom snakeweed	GUSA2	*Gutierrezia sarothrae*	0–6	–
	littleleaf ratany	KRER	*Krameria erecta*	0–6	–
	Mexican bladdersage	SAME	*Salazaria mexicana*	0–6	–
	American threefold	TRCA8	*Trixis californica*	0–2	–
	whitestem paperflower	PSCO2	*Psilostrophe cooperi*	0–2	–
	white ratany	KRGR	*Krameria grayi*	0–2	–
	Arizona desert-thorn	LYEX	*Lycium exsertum*	0–2	–
	rayless goldenhead	ACSP	*Acamptopappus sphaerocephalus*	0–2	–
	sangre de cristo	JACA2	*Jatropha cardiophylla*	0–1	–
	ocotillo	FOSP2	*Fouquieria splendens*	0–1	–
	Coulter's brickellbush	BRCO	*Brickellia coulteri*	0–1	–
11	**Succulents**			1–56	
	saguaro	CAGI10	*Carnegiea gigantea*	0–22	–
	cactus apple	OPEN3	*Opuntia engelmannii*	1–11	–
	tulip pricklypear	OPPH	*Opuntia phaeacantha*	0–6	–
	soaptree yucca	YUEL	*Yucca elata*	0–6	–
	walkingstick cactus	CYSP8	*Cylindropuntia spinosior*	0–6	–
	staghorn cholla	CYVE3	*Cylindropuntia versicolor*	0–6	–
	jumping cholla	CYFU10	*Cylindropuntia fulgida*	0–6	–
	candy barrelcactus	FEWI	*Ferocactus wislizeni*	0–6	–
	Graham's nipple cactus	MAGR9	*Mammillaria grahamii*	0–1	–
	Christmas cactus	CYLE8	*Cylindropuntia leptocaulis*	0–1	–
	Engelmann's hedgehog cactus	ECEN	*Echinocereus engelmannii*	0–1	–
	pinkflower hedgehog cactus	ECFA	*Echinocereus fasciculatus*	0–1	–
	Santa Rita pricklypear	OPSA	*Opuntia santa-rita*	0–1	–
	nightblooming cereus	PEGR3	*Peniocereus greggii*	0–1	–
	purple pricklypear	OPMA8	*Opuntia macrocentra*	0–1	–
	long-tubercle beehive cactus	COROR	*Coryphantha robustispina ssp. robustispina*	0–1	–
	[illegible]	CYAC2	*Cylindropuntia acanthocarpa*	0–1	

	buck-horn cholla	CYAC8	*Cylindropuntia acanthocarpa*	0–1	–
	Arizona pencil cholla	CYAR14	*Cylindropuntia arbuscula*	0–1	–
Tree					
14	**Trees**			78–224	
	yellow paloverde	PAMI5	*Parkinsonia microphylla*	34–112	–
	velvet mesquite	PRVE	*Prosopis velutina*	22–112	–
	desert ironwood	OLTE	*Olneya tesota*	0–45	–
	blue paloverde	PAFL6	*Parkinsonia florida*	0–11	–

Animal community

The plant community on this site is suitable for grazing by all classes of cattle, at any season. Forage species grow year-round with available moisture. Shallow rooted perennial grasses are severely affected by drought on this site. Management should be designed to maintain the deeper rooted suffrutescent and mid-grasses on the site. The plant community on the site provides adequate nutrition for livestock throughout the year.

Water developments are very important to wildlife species on this site, vegetative cover and forage diersity are good enough for a variety of wildlife including the large mammals.

Hydrological functions

This site has coarse textured soils and low gradient slopes and is a poor producer of runoff.

Recreational uses

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

Wood products

Mesquite furnishes limited firewood. In freeze free areas dead ironwood trees furnish wood for hobby uses and firewood.

Other products

Saguaro ribs, cholla skeletons, prickly pear tunas and pads, cholla buds and mesquite beans.

Inventory data references

Range 417s include 2 in good condition and 1 in fair condition.

Type locality

Location 1: Pima County, AZ	
Township/Range/Section	T16S R7E S3
General legal description	Sells Field Office - Tribal Herd Ranch
Location 2: Pima County, AZ	
Township/Range/Section	T18S R14E S35
General legal description	Tucson Field Office - Santa Rita Exp. Range
Location 3: Pima County, AZ	
Township/Range/Section	T16S R9E S31
General legal description	Kings Anvil Ranch in the northwest corner of the Cactus Pasture along Mendoza wash.

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)	Dan Robinett
Contact for lead author	NRCS Tucson Plant Materials Center
Date	07/03/2003
Approved by	S. Cassady
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

Indicators

1. **Number and extent of rills:** None

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2. **Presence of water flow patterns:** 40-50 feet apart, continuous from 50-100 feet in length with 4-5% slope.

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3. **Number and height of erosional pedestals or terracettes:** Pedestals on most subshrubs and bush muhly are common. None on other grasses or gravels. Terracettes are not present.

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4. **Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):** 40-45%; gravel 5%, cryptogams 5-7%, liter & herbaceous basal 40%

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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 litter transported 3-5 feet ir water flow paths. Woody litter does not move. Herbaceous litter on interfluves does not move.

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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):** 60% are 4-6 ratings, 40% are 1-3 ratings

9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** Weak subangular blocky; brown SL 2-3 inches thick, light brown SL 3-60 inches thick

10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:** 10-15% canopy of trees, 5% canopy of subshrubs and bush muhly, and 5-10% canopy of cacti & large shrubs after 4 years of drought.

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: bush muhly = trees > succulents > annuals > large shrubs > subshrubs > crytogams > other perennial grasses > perennial forbs (after 4 years of severe drought)

    Sub-dominant:

    Other:

    Additional:

13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):** 50-75% mortality on bush muhly, burroweed, triangle goldeneye & desert zinnia; 20% mortality on Opuntia species

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):** 145 lbs/ac unfavorable precipitation; 720 lbs/ac normal precipitation; 1290 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:** red brome, malta starthistle, bufflegrass, fountaingrass, Sahara mustard

17. **Perennial plant reproductive capability:** Not impaired for shrubs, drought impaired for perennial grasses and forbs.