USDA Natural Resources
Conservation Service

Ecological site R040XA108AZ
Limy Fan 10"-13" p.z.

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General information

Provisional. A provisional ecological site description has undergone quality control and quality assurance review. It contains a working state and transition model and enough information to identify the ecological site.

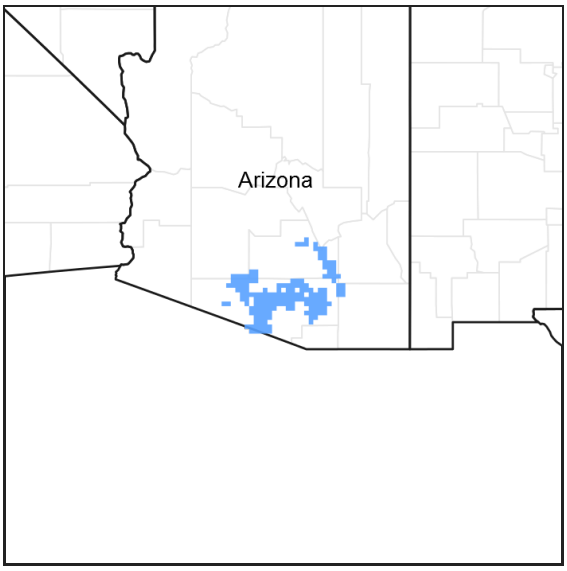

Figure 1. Mapped extent

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.**
R040XA112AZ	**Loamy Swale 10"-13" p.z.**
R040XA115AZ	**Sandy Wash 10"-13" p.z.**

Similar sites

R041XB206AZ	**Limy Fan 8-12" p.z.**
R040XB207AZ	**Limy Fan 7"-10" p.z.**

Table 1. Dominant plant species

Tree	Not specified
Shrub	(1) *larrea tridentata*
Herbaceous	(1) *muhlenbergia porteri*

Physiographic features

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

Table 2. Representative physiographic features

Landforms	(1) Fan (2) Terrace (3) Alluvial fan
Flooding duration	Extremely brief (0.1 to 4 hours)
Flooding frequency	Very rare to none
Ponding frequency	None
Elevation	579–975 m
Slope	1–5%
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 soils are deep soils formed in limy, loamy alluvium of mixed origin. They are calcareous throughout. Calcic horizons occur at shallow depths. Plant-soil moisture relationships are fair to good.
Soils mapped on this site include:
SSA-661 Eastern Pinal-Southern Gila Counties MU's Ugyp-505, Whitecliff-505 & 525;
SSA-666 Northwest Cochise County MU's Dudleyville-487 & Agustin-487;
SSA-668 Tucson-Avra Valley area MU's Anthony-AhB, Gila-GbB, Laveen-LaA, LaB, LdB, LeA, LeB, LmB, LrB & TxB, Laveen Varient-LsB, Rillito-ClC, LrB, RdB, ReC & RtB, Tres Hermanos-MtB, RtB, ThB TmB & TwB;
SSA-669 Eastern Pima County MU's Yaqui-86, Sahuarita-72 & 78;
SSA-703 Tohono O'odham area MU's Agustin-60, Chutum-13, Glendale-29 & 30, Pajarito-30 & 47, & Sahuarito-47.

Table 4. Representative soil features

Surface texture	(1) Sandy loam (2) Gravelly sandy loam (3) Fine sandy loam
Family particle size	(1) Loamy
Drainage class	Well drained
Permeability class	Moderately rapid to moderate
Soil depth	152 cm
Surface fragment cover <=3"	0–50%
Surface fragment cover >3"	0–5%
Available water capacity (0-101.6cm)	12.7–17.78 cm
Calcium carbonate equivalent (0-101.6cm)	5–30%
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)	7.8–8.4
Subsurface fragment volume <=3" (Depth not specified)	0–30%
Subsurface fragment volume >3" (Depth not specified)	0–2%

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

State 1
Historical Climax Plant Community

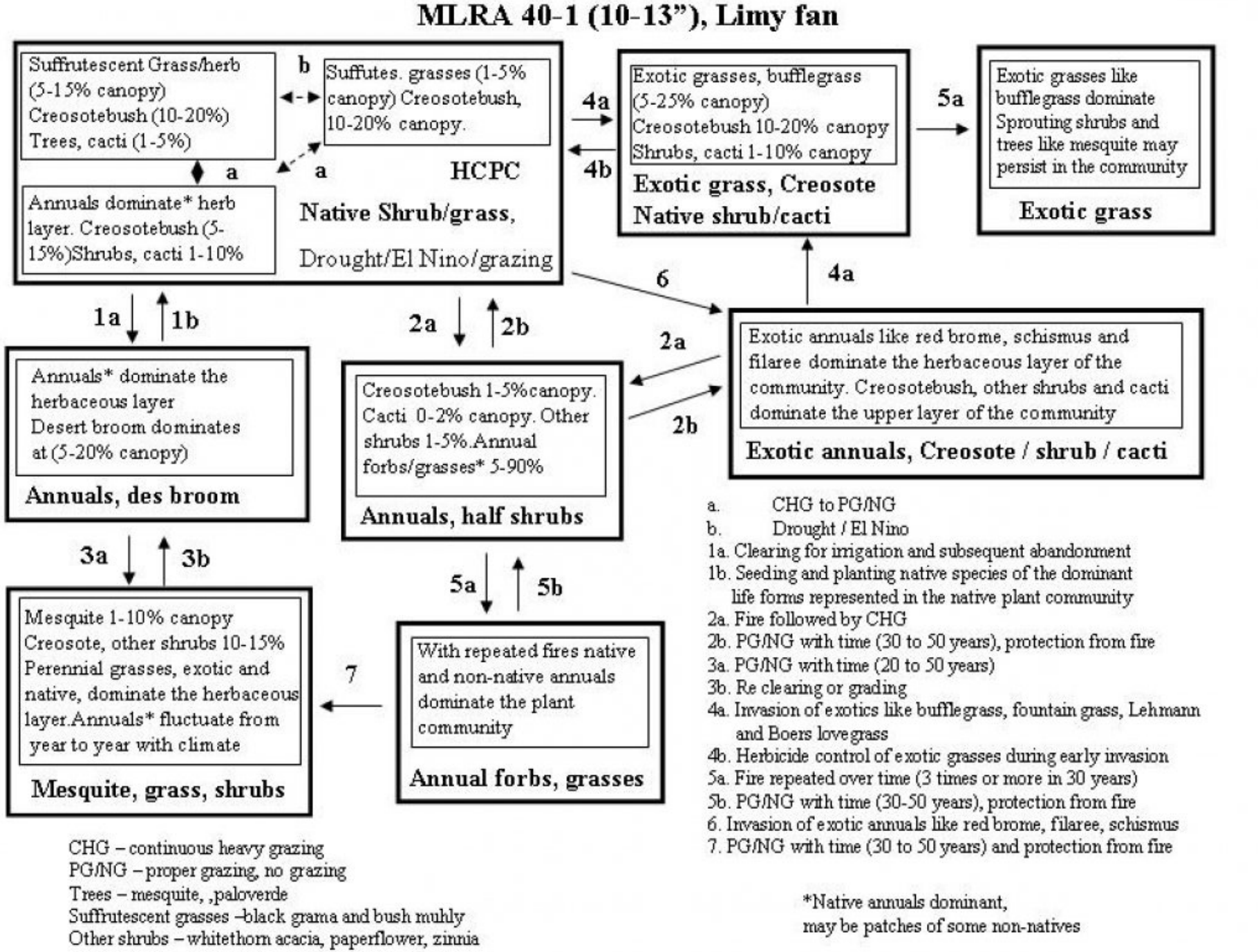

Figure 4. State and Transition model, Limy Fan 10-13" pz.

Community 1.1
Historical Climax Plant Community

The potential plant community is a shrubland dominated by creosotebush. Annual forbs and grasses are very important in the plant community on this site, but fluctuate from nearly nothing in dry years to several hundred pounds per acre in wet years. Cryptogams (algae, lichens, mosses) are also important in the plant communities on this site. With continuous heavy grazing, bush muhly is removed from the plant community and creosotebush increases. Areas of this site mapped in alluvial fan positions are very susceptible to rill and gully erosion.

Table 5. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Grass/Grasslike	7	112	527
Forb	2	168	471
Shrub/Vine	114	280	437
Tree	–	6	28
Total	**123**	**566**	**1463**

Table 6. Soil surface cover

Tree basal cover	0%
Shrub/vine/liana basal cover	1-3%
Grass/grasslike basal cover	0-1%
Forb basal cover	0-1%
Non-vascular plants	0%
Biological crusts	15-35%
Litter	10-80%
Surface fragments >0.25" and <=3"	0-50%
Surface fragments >3"	0-5%
Bedrock	0%
Water	0%
Bare ground	5-70%

Table 7. Canopy structure (% cover)

Height Above Ground (M)	Tree	Shrub/Vine	Grass/ Grasslike	Forb
<0.15	–	–	0-25%	0-50%
>0.15 <= 0.3	–	0-1%	0-10%	0-15%
>0.3 <= 0.6	–	0-1%	1-5%	0-5%
>0.6 <= 1.4	–	5-15%	–	–
>1.4 <= 4	0-1%	0-5%	–	–
>4 <= 12	0-1%	–	–	–
>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
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 for many years. This state will persist for several years before other shrubs and desert trees come in and assume dominance.

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 creosote 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.

State 4
Exotic perennial grasses with natives

Community 4.1
Exotic perennial grasses with natives

This state occurs where exotic perennial grass species like bufflegrass have invaded the native plant community. Bufflegrass fills the niche of native perennial like bush muhly and will even compete with creosotebush on this site.

State 5
Exotic perennial grasses and fire

Community 5.1
Exotic perennial grasses and fire

This community occurs where a native plant community that has been invaded by bufflegrass or fountain grass has burned one or more times. Increasing amounts of exotic perennial grasses leads to more uniform fine fuels. Frequent fires will remove creosotebush and other native shrubs, trees and cacti from the plant community. 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 6
Native plant community with exotic annuals

Community 6.1

Native plant community with 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 7
Annuals, half shrubs and fire

Community 7.1
Annuals, half shrubs and fire

This plant community occurs as a result of a single hot season fire. Paloverde, creosotebush and cacti 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, paperflower or desert zinnia can recover. Perennial grasses can recover rapidly if grazing pressure is low and summer rains are sufficient. This plant community can produce more than 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 8
Annuals and fire

Community 8.1
Annuals and fire

This plant community occurs where the native plant community has burned repeatedly. As fires become more frequent the native 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.

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 grass**			6–112	
	bush muhly	MUPO2	*Muhlenbergia porteri*	6–112	–
2	**Sub dominant perennial grasses**			0–56	
	whiplash pappusgrass	PAVA2	*Pappophorum vaginatum*	0–34	–
	Parish's threeawn	ARPUP5	*Aristida purpurea var. parishii*	0–22	–
	spike dropseed	SPCO4	*Sporobolus contractus*	0–11	–
	false Rhodes grass	TRCR9	*Trichloris crinita*	0–11	–
3	**Miscellaneous perennial grasses**			0–22	
	Parry's grama	BOPA2	*Bouteloua parryi*	0–17	–
	Rothrock's grama	BORO2	*Bouteloua rothrockii*	0–17	–
	purple threeawn	ARPU9	*Aristida purpurea*	0–11	–
	spidergrass	ARTE3	*Aristida ternipes*	0–11	–
	low woollygrass	DAPU7	*Dasyochloa pulchella*	0–6	–

	Santa Rita threeawn	ARCAG	*Aristida californica var. glabrata*	0–6	–
	nineawn pappusgrass	ENDE	*Enneapogon desvauxii*	0–6	–
	big sacaton	SPWR2	*Sporobolus wrightii*	0–6	–
	tobosagrass	PLMU3	*Pleuraphis mutica*	0–1	–
	plains bristlegrass	SEVU2	*Setaria vulpiseta*	0–1	–
	sand dropseed	SPCR	*Sporobolus cryptandrus*	0–1	–
	mesa dropseed	SPFL2	*Sporobolus flexuosus*	0–1	–
	Arizona cottontop	DICA8	*Digitaria californica*	0–1	–
4	**Annual grasses**			1–336	
	sixweeks grama	BOBA2	*Bouteloua barbata*	0–112	–
	sixweeks fescue	VUOC	*Vulpia octoflora*	0–112	–
	mucronate sprangeltop	LEPAB	*Leptochloa panicea ssp. brachiata*	0–56	–
	sixweeks threeawn	ARAD	*Aristida adscensionis*	0–56	–
	prairie threeawn	AROL	*Aristida oligantha*	0–56	–
	needle grama	BOAR	*Bouteloua aristidoides*	0–56	–
	Mexican panicgrass	PAHI5	*Panicum hirticaule*	0–28	–
	Bigelow's bluegrass	POBI	*Poa bigelovii*	0–11	–
	desert lovegrass	ERPEM	*Eragrostis pectinacea var. miserrima*	0–11	–
	tufted lovegrass	ERPEP2	*Eragrostis pectinacea var. pectinacea*	0–11	–
	Arizona signalgrass	URAR	*Urochloa arizonica*	0–6	–
	canyon cupgrass	ERLE7	*Eriochloa lemmonii*	0–6	–
	Mexican sprangletop	LEFUU	*Leptochloa fusca ssp. uninervia*	0–2	–
	Arizona brome	BRAR4	*Bromus arizonicus*	0–2	–
	delicate muhly	MUFR	*Muhlenbergia fragilis*	0–1	–
	littleseed muhly	MUMI	*Muhlenbergia microsperma*	0–1	–
Forb					
5	**Perennial forbs**			1–22	
	red-gland spurge	CHME5	*Chamaesyce melanadenia*	0–6	–
	Indian rushpea	HOGL2	*Hoffmannseggia glauca*	0–6	–
	lacy tansyaster	MAPIP4	*Machaeranthera pinnatifida ssp. pinnatifida var. pinnatifida*	0–6	–
	Coues' cassia	SECO10	*Senna covesii*	0–6	–
	desert globemallow	SPAM2	*Sphaeralcea ambigua*	0–6	–
	dwarf desertpeony	ACNA2	*Acourtia nana*	0–2	–
	trailing windmills	ALIN	*Allionia incarnata*	0–2	–
	weakleaf bur ragweed	AMCO3	*Ambrosia confertiflora*	0–1	–
	hairyseed bahia	BAAB	*Bahia absinthifolia*	0–1	–
	desert marigold	BAMU	*Baileya multiradiata*	0–1	–
	hairy five eyes	CHSO	*Chamaesaracha sordida*	0–1	–
	leatherweed	CRPOP	*Croton pottsii var. pottsii*	0–1	–
	fingerleaf gourd	CUDI	*Cucurbita digitata*	0–1	–
	coyote gourd	CUPA	*Cucurbita palmata*	0–1	–
	spreading fleabane	ERDI4	*Erigeron divergens*	0–1	–
	caliche globemallow	SPLA	*Sphaeralcea laxa*	0–1	–

	pricklyleaf dogweed	THAC	*Thymophylla acerosa*	0–1	–
	Tumamoc globeberry	TUMA	*Tumamoca macdougalii*	0–1	–
	desert tobacco	NIOBO	*Nicotiana obtusifolia var. obtusifolia*	0–1	–
	mesquite mistletoe	PHCA8	*Phoradendron californicum*	0–1	–
	slender poreleaf	POGR5	*Porophyllum gracile*	0–1	–
6	**Annual forbs**			1–448	
	Gordon's bladderpod	LEGO	*Lesquerella gordonii*	0–112	–
	Nuttall's povertyweed	MONU	*Monolepis nuttalliana*	0–112	–
	combseed	PECTO	*Pectocarya*	0–56	–
	manybristle chinchweed	PEPA2	*Pectis papposa*	0–56	–
	shaggyfruit pepperweed	LELA	*Lepidium lasiocarpum*	0–56	–
	California poppy	ESCAM	*Eschscholzia californica ssp. mexicana*	0–56	–
	bristly fiddleneck	AMTE3	*Amsinckia tessellata*	0–56	–
	wheelscale saltbush	ATEL	*Atriplex elegans*	0–56	–
	woolly plantain	PLPA2	*Plantago patagonica*	0–56	–
	distant phacelia	PHDI	*Phacelia distans*	0–28	–
	Arizona popcornflower	PLAR	*Plagiobothrys arizonicus*	0–28	–
	desert Indianwheat	PLOV	*Plantago ovata*	0–28	–
	miniature woollystar	ERDI2	*Eriastrum diffusum*	0–28	–
	California goldfields	LACAC2	*Lasthenia californica ssp. californica*	0–28	–
	Coulter's lupine	LUSP2	*Lupinus sparsiflorus*	0–28	–
	foothill deervetch	LOHU2	*Lotus humistratus*	0–22	–
	cleftleaf wildheliotrope	PHCR	*Phacelia crenulata*	0–22	–
	Texas stork's bill	ERTE13	*Erodium texanum*	0–22	–
	flatcrown buckwheat	ERDE6	*Eriogonum deflexum*	0–22	–
	western tansymustard	DEPI	*Descurainia pinnata*	0–22	–
	Coulter's spiderling	BOCO2	*Boerhavia coulteri*	0–22	–
	cryptantha	CRYPT	*Cryptantha*	0–22	–
	carelessweed	AMPA	*Amaranthus palmeri*	0–22	–
	smallflowered milkvetch	ASNU4	*Astragalus nuttallianus*	0–22	–
	woolly tidestromia	TILA2	*Tidestromia lanuginosa*	0–22	–
	woollyhead neststraw	STMI2	*Stylocline micropoides*	0–22	–
	thelypody	THELY	*Thelypodium*	0–17	–
	Arizona poppy	KAGR	*Kallstroemia grandiflora*	0–17	–
	Arizona phacelia	PHAR13	*Phacelia arizonica*	0–17	–
	California desertdandelion	MACA6	*Malacothrix californica*	0–17	–
	slender goldenweed	MAGR10	*Machaeranthera gracilis*	0–17	–
	mesa tansyaster	MATA	*Machaeranthera tagetina*	0–17	–
	coastal bird's-foot trefoil	LOSAB	*Lotus salsuginosus var. brevivexillus*	0–11	–
	wedgeleaf draba	DRCU	*Draba cuneifolia*	0–11	–
	American wild carrot	DAPU3	*Daucus pusillus*	0–11	–
	star gilia	GIST	*Gilia stellata*	0–11	–

	yellow tackstem	CAPA7	*Calycoseris parryi*	0–11	–
	white tackstem	CAWR	*Calycoseris wrightii*	0–11	–
	Esteve's pincushion	CHST	*Chaenactis stevioides*	0–11	–
	sand pygmyweed	CRCOC	*Crassula connata var. connata*	0–11	–
	Coulter's globemallow	SPCO2	*Sphaeralcea coulteri*	0–11	–
	New Mexico plumeseed	RANE	*Rafinesquia neomexicana*	0–6	–
	sleepy silene	SIAN2	*Silene antirrhina*	0–6	–
	sand fringepod	THCU	*Thysanocarpus curvipes*	0–6	–
	Louisiana vetch	VILU	*Vicia ludoviciana*	0–6	–
	hairy prairie clover	DAMO	*Dalea mollis*	0–6	–
	white easterbonnets	ANLA7	*Antheropeas lanosum*	0–6	–
	fringed amaranth	AMFI	*Amaranthus fimbriatus*	0–6	–
	California suncup	CACA32	*Camissonia californica*	0–6	–
	whitestem blazingstar	MEAL6	*Mentzelia albicaulis*	0–6	–
	Lindley's silverpuffs	MILI5	*Microseris lindleyi*	0–6	–
	glandular threadplant	NEGL	*Nemacladus glanduliferus*	0–6	–
	desert evening primrose	OEPR	*Oenothera primiveris*	0–6	–
	Florida pellitory	PAFL3	*Parietaria floridana*	0–2	–
	green carpetweed	MOVE	*Mollugo verticillata*	0–2	–
	bristly nama	NAHI	*Nama hispidum*	0–2	–
	Mexican fireplant	EUHE4	*Euphorbia heterophylla*	0–2	–
	hairy desertsunflower	GECA2	*Geraea canescens*	0–2	–
	brittle spineflower	CHBR	*Chorizanthe brevicornu*	0–2	–
	hoary bowlesia	BOIN3	*Bowlesia incana*	0–2	–
	hyssopleaf sandmat	CHHY3	*Chamaesyce hyssopifolia*	0–2	–
	staggerweed	STAR	*Stachys arvensis*	0–2	–
	doubleclaw	PRPA2	*Proboscidea parviflora*	0–2	–
	bristly scaleseed	SPEC2	*Spermolepis echinata*	0–1	–
	false carrot	YAMI	*Yabea microcarpa*	0–1	–
	Sonoran sandmat	CHMI7	*Chamaesyce micromera*	0–1	–
	Chiricahua Mountain sandmat	CHFL3	*Chamaesyce florida*	0–1	–
	Thurber's buckwheat	ERTH3	*Eriogonum thurberi*	0–1	–
	California mustard	GULA4	*Guillenia lasiophylla*	0–1	–
	Palmer's grapplinghook	HAPA7	*Harpagonella palmeri*	0–1	–
	flatspine stickseed	LAOCO	*Lappula occidentalis var. occidentalis*	0–1	–
	dainty desert hideseed	EUMI2	*Eucrypta micrantha*	0–1	–
	spring pygmycudweed	EVVE	*Evax verna*	0–1	–
	Abert's buckwheat	ERAB2	*Eriogonum abertianum*	0–1	–
	Mojave desertstar	MOBE2	*Monoptilon bellioides*	0–1	–
Shrub/Vine					
7	**Dominant shrub**			112–336	
	creosote bush	LATRT	*Larrea tridentata var. tridentata*	112–336	–

	creosote bush	LATR2	Larrea tridentata var. tridentata	1–30	
8	**Miscellaneous shrubs**			0–34	
	whitethorn acacia	ACCO2	*Acacia constricta*	0–22	–
	Arizona desert-thorn	LYEX	*Lycium exsertum*	0–11	–
	water jacket	LYAN	*Lycium andersonii*	0–6	–
	fourwing saltbush	ATCA2	*Atriplex canescens*	0–6	–
	soaptree yucca	YUEL	*Yucca elata*	0–2	–
	lotebush	ZIOB	*Ziziphus obtusifolia*	0–2	–
	Warnock's snakewood	COWA	*Condalia warnockii*	0–1	–
	crown of thorns	KOSP	*Koeberlinia spinosa*	0–1	–
	catclaw acacia	ACGR	*Acacia greggii*	0–1	–
9	**Half shrubs**			0–34	
	whitestem paperflower	PSCO2	*Psilostrophe cooperi*	0–17	–
	desert zinnia	ZIAC	*Zinnia acerosa*	1–17	–
	triangle bur ragweed	AMDE4	*Ambrosia deltoidea*	0–11	–
	littleleaf ratany	KRER	*Krameria erecta*	0–11	–
	white ratany	KRGR	*Krameria grayi*	0–11	–
	threadleaf snakeweed	GUMI	*Gutierrezia microcephala*	0–2	–
	broom snakeweed	GUSA2	*Gutierrezia sarothrae*	0–1	–
	burroweed	ISTE2	*Isocoma tenuisecta*	0–1	–
10	**Succulents**			2–34	
	Christmas cactus	CYLE8	*Cylindropuntia leptocaulis*	1–11	–
	tulip pricklypear	OPPH	*Opuntia phaeacantha*	1–11	–
	nightblooming cereus	PEGRG	*Peniocereus greggii var. greggii*	0–6	–
	Arizona pencil cholla	CYAR14	*Cylindropuntia arbuscula*	0–6	–
	devil's cholla	GRKU	*Grusonia kunzei*	0–6	–
	cactus apple	OPEN3	*Opuntia engelmannii*	0–6	–
	purple pricklypear	OPMA8	*Opuntia macrocentra*	0–2	–
	candy barrelcactus	FEWI	*Ferocactus wislizeni*	0–2	–
	jumping cholla	CYFU10	*Cylindropuntia fulgida*	0–2	–
	walkingstick cactus	CYSP8	*Cylindropuntia spinosior*	0–2	–
	staghorn cholla	CYVE3	*Cylindropuntia versicolor*	0–2	–
	saguaro	CAGI10	*Carnegiea gigantea*	0–2	–
	buck-horn cholla	CYAC8	*Cylindropuntia acanthocarpa*	0–1	–
	Engelmann's hedgehog cactus	ECEN	*Echinocereus engelmannii*	0–1	–
	pinkflower hedgehog cactus	ECFA	*Echinocereus fasciculatus*	0–1	–
	beavertail pricklypear	OPBA2	*Opuntia basilaris*	0–1	–
Tree					
11	**Trees**			0–28	
	velvet mesquite	PRVE	*Prosopis velutina*	0–28	–
	blue paloverde	PAFL6	*Parkinsonia florida*	0–6	–
	yellow paloverde	PAMI5	*Parkinsonia microphylla*	0–6	–

Animal community

This site is more suitable for seasonal grazing use. The bulk of the forage produced consists of either winter or summer annual grasses and forbs in average or above average rainfall years. Perennial forage species can grow year round with available moisture but are in limited amounts in the plant community. Forage production on the site in dry years is very low. Bush muhly is shrub-like in character and plants supported by creosotebush should be utilized as browse plants.

Vegetative cover and forage diversity are lacking for large desert mammals on this site. It is home mainly to small, burrowing animals and rabbits.

Hydrological functions

The soils on this site are medium textured but with nearly level slopes it is only a fair producer of runoff.

Recreational uses

Hunting, hiking, camping, birdwatching, horseback riding.

Wood products

Very limited mesquite for camp fires and branding fires.

Other products

Creosotebush for medicinal uses. Prickly pear and cholla fruits.

Inventory data references

Range 417s include 1 in good condition

Type locality

Location 1: Pima County, AZ	
Township/Range/Section	T17S R15E S31
General legal description	Tucson FO - Santa Rita Experimental Range NE 1/4 of sec. 31
Location 2: Pima County, AZ	
Township/Range/Section	T9S R2E S20
General legal description	Sells FO - Headwaters of Vekol Valley
Location 3: Pima County, AZ	
Township/Range/Section	T16S R15E S14
General legal description	Pima County Fairgrounds, fenced in 1975.

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:** none

2. **Presence of water flow patterns:** Water flow patterns are common on this site covering 10-15% of the area.

3. **Number and height of erosional pedestals or terracettes:** Pedestals are uncommon on grasses and gravels. Terracettes aer uncommon. Mounds ae common on shrubs like creosote bush.

4. **Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):** Bare ground on this site is 25-40%.

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):** Herbaceous litter moves only in water flow paths 10-15 feet and is deposited in terracettes at curves in flow paths. Woody litter remains in place under shrub canopies.

8. **Soil surface (top few mm) resistance to erosion (stability values are averages - most sites will show a range of values):** Expect ratings of 4-6 under shrub and grass canopies, and 1-3 in openings. High gravel/cobble cover provides good resistance to erosion.

9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** Thin platy structure from rain drop impact to weak granular; 7.5-10YR5-6/5-6 dry; 7.5-10YR4/4-6 moist; thickness to 4 inches

10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:** large shrubs (creosote #1, whitethorn #2, mesquite #3) 15-20% canopy cover;

shrublike grasses (bush muhly) have a 2-5% canopy cover, sub-shrubs including desert zinnia, burroweed, and paper flower have a 2-5% canopy cover and succulents like prickly pear, agave, and barrel cactus have a 1-2% canopy cover.

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11. **Presence and thickness of compaction layer (usually none; describe soil profile features which may be mistaken for compaction on this site):** Soil surface (0.25-0.5 inch) has a platy structure due to overland water flow and some raindrop impact. There is no subsurface soil compaction.

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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: large shrubs > shrub-like grasses > sub-shrubs > annual forbs and grasses > other perennial grasses > succulents > perennial forbs > cryptogams. (In El Nino years, the production of annual forbs can exceed all other plant species.)

    Sub-dominant:

    Other:

    Additional:

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13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):** Severe drought last several years resulting in 90-100% mortality on short perennial grasses (threeawns), 50% mortality on bush muhly, 75% mortality on sub-shrubs and 10-15% mortality on large shrubs.

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14. **Average percent litter cover (%) and depth (in):**

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15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):** 110 lbs/ac unfavorable precipitation; 505 lbs/ac normal precipitation; 1305 lbs/ac favorable precipitation.

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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:** schismus, filaree, malta srarthistle

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