

Ecological site R040XA102AZ Clayey Swale 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.

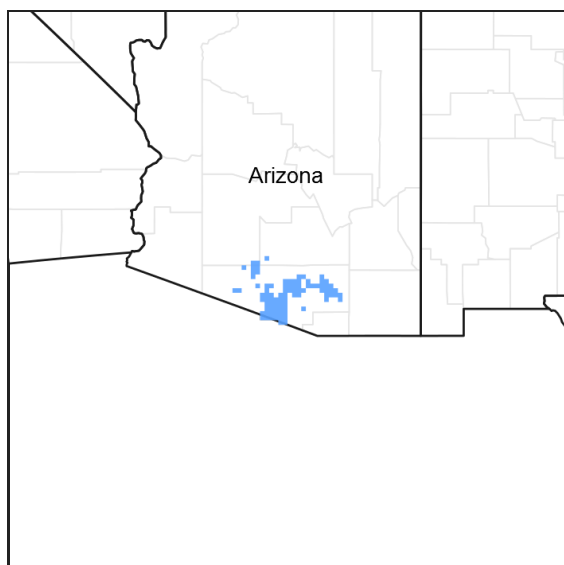


Figure 1. Mapped extent

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

R040XA104AZ	Clayey Upland 10"-13" p.z.
R040XA108AZ	Limy Fan 10"-13" p.z.
R040XA112AZ	Loamy Swale 10"-13" p.z.

Similar sites

R040XB203AZ	Clayey Swale 7"-10" p.z.
R041XC302AZ	Clayey Swale 12-16" p.z.
R041XB202AZ	Clayey Swale 8-12" p.z.

Table 1. Dominant plant species

Tree	Not specified
Shrub	(1) <i>Opuntia chlorotica</i>
Herbaceous	(1) <i>Pleuraphis mutica</i> (2) <i>Panicum obtusum</i>

Physiographic features

This site occurs in the upper elevations of the Sonoran Desert in southern Arizona. This site receives extra moisture in the form of runoff from adjacent upland areas. It occurs on floodplains, alluvial fans and swales.

Table 2. Representative physiographic features

Landforms	(1) Alluvial fan (2) Flood plain (3) Swale
Flooding duration	Extremely brief (0.1 to 4 hours) to very brief (4 to 48 hours)
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	1,900–3,300 ft
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
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Freeze-free period (average)	0 days
Precipitation total (average)	13 in

Influencing water features

There are no water features associated with this site.

Soil features

These are deep soils on clayey, recent alluvium of mixed origins. They are dark colored and have high shrink-swell potentials. Churning and cracking cause very rough surfaces. Plant-soil moisture relationships are good. The soils mapped on this site are: SSA-645 Aguila-Carefree MU's Guest-67 & 88; SSA-669 Eastern Pima County Hantz-34; SSA-703 Tohono O'odham MU's Tubac-6 & Hantz-34.

Table 4. Representative soil features

Surface texture	(1) Clay loam (2) Silty clay loam (3) Clay
Family particle size	(1) Clayey
Drainage class	Well drained
Permeability class	Slow to very slow
Soil depth	60 in
Surface fragment cover <=3"	0–10%
Surface fragment cover >3"	0–1%
Available water capacity (0-40in)	9–10 in
Calcium carbonate equivalent (0-40in)	0–10%
Electrical conductivity (0-40in)	0–4 mmhos/cm
Sodium adsorption ratio (0-40in)	0–13
Soil reaction (1:1 water) (0-40in)	7.2–8.2
Subsurface fragment volume <=3" (Depth not specified)	0–5%
Subsurface fragment volume >3" (Depth not specified)	0%

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"), Clayey Swale

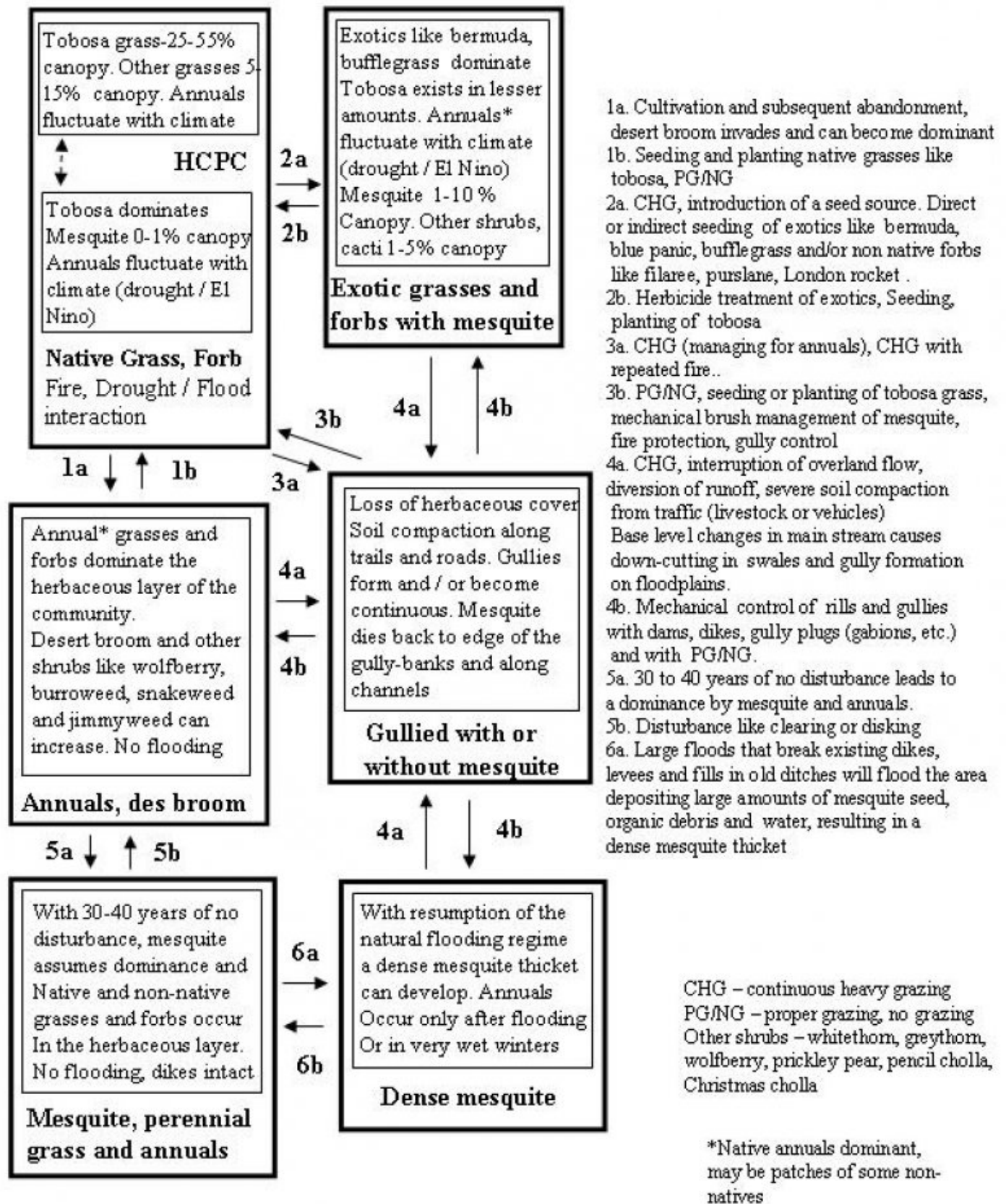


Figure 4. State and Transition, Clayey swale 10-13" pz.

State 1
Historical Climax Plant Community

Community 1.1

Historical Climax Plant Community

The potential plant community on this site is dominated by tobosa grass. A few shrubby species like soaptree yucca and prickley pear dot this open grassland site. With continuous, heavy grazing, the tobosa cover is depleted in patches. This site is extremely susceptible to gully erosion when grass cover has been removed. Shrubby species like snakeweed, prickley pear, and mesquite can invade or increase to become dominant where gully formation drains water off rapidly and dries the site.

Table 5. Annual production by plant type

Plant Type	Low (Lb/Acre)	Representative Value (Lb/Acre)	High (Lb/Acre)
Grass/Grasslike	815	1300	1850
Forb	10	100	460
Shrub/Vine	1	5	30
Tree	0	0	10
Total	826	1405	2350

Table 6. Soil surface cover

Tree basal cover	0%
Shrub/vine/liana basal cover	0%
Grass/grasslike basal cover	10-35%
Forb basal cover	0-1%
Non-vascular plants	0%
Biological crusts	5-15%
Litter	30-80%
Surface fragments >0.25" and <=3"	0-5%
Surface fragments >3"	0-1%
Bedrock	0%
Water	0%
Bare ground	5-40%

Table 7. Canopy structure (% cover)

Height Above Ground (Ft)	Tree	Shrub/Vine	Grass/ Grasslike	Forb
<0.5	—	—	0-5%	0-5%
>0.5 <= 1	—	—	5-15%	1-5%
>1 <= 2	—	0-1%	10-35%	0-15%
>2 <= 4.5	—	0-1%	0-5%	0-1%
>4.5 <= 13	0-1%	—	—	—
>13 <= 40	—	—	—	—
>40 <= 80	—	—	—	—
>80 <= 120	—	—	—	—
>120	—	—	—	—

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 pencil cholla 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 and along borders and old ditches. Some areas (with heavy soil crusting due to silty clayloam textures) may be entirely barren until a wet winter is effective in producing a crop of annuals. 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 grasses and forbs

Community 4.1

Exotic grasses and forbs

Non-native perennial grasses like bermuda, Johnson grass, buffleggrass and exotic annuals like filaree, red brome, schismus, London rocket, Carolina canarygrass and purslane invade the native plant community. These species displace native perennial and annual grasses and forbs.

State 5

Gullied

Community 5.1

Gullied

This state occurs where the site has severe sheet, rill and gully erosion. Lack of plant cover, soil compaction and concentration of surface water flow will lead to rilling and gully formation. Usually these areas lack any perennial cover except along drainage ways. Base level changes in large stream systems can lead to gullying of this site where it is tributary to the main stream.

State 6

Dense mesquite

Community 6.1

Dense mesquite

This state occurs where large floods have breached the dikes and levees and filled the drainage ditches that used to protect the irrigated lands. Floods bring large amounts of mesquite seed, organic debris and water in and can cause a mesquite thicket to form. Usually the shrub density in these thickets is so high that they are impenetrable. This state can also form on areas that have not been converted to cropland by continuous heavy grazing, depletion of grass cover, soil compaction and subsequent invasion and increase by mesquite.

Additional community tables

Table 8. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Lb/Acre)	Foliar Cover (%)
Grass/Grasslike					
1	Dominant perennial grass			800–1200	
	tobosagrass	PLMU3	<i>Pleuraphis mutica</i>	800–1200	–
2	Misc perennial grasses			10–150	
	vine mesquite	PAOB	<i>Panicum obtusum</i>	5–100	–
	whiplash pappusgrass	PAVA2	<i>Pappophorum vaginatum</i>	0–20	–
	bush muhly	MUPO2	<i>Muhlenbergia porteri</i>	0–20	–
	burrograss	SCBR2	<i>Scleropogon brevifolius</i>	0–10	–
	sideoats grama	BOCU	<i>Bouteloua curtipendula</i>	0–10	–
	plains bristlegrass	SEVU2	<i>Setaria vulpiseta</i>	0–10	–
	Parish's threeawn	ARPUP5	<i>Aristida purpurea</i> var. <i>parishii</i>	0–10	–
	spidergrass	ARTE3	<i>Aristida ternipes</i>	0–10	–
	spidergrass	ARTEG	<i>Aristida ternipes</i> var. <i>gentilis</i>	0–10	–
	spike dropseed	SPCO4	<i>Sporobolus contractus</i>	0–5	–
	Arizona cottontop	DICA8	<i>Digitaria californica</i>	0–5	–
	large-spike bristlegrass	SEMA5	<i>Setaria macrostachya</i>	0–5	–
	western wheatgrass	PASM	<i>Pascopyrum smithii</i>	0–5	–
	curly-mesquite	HIBE	<i>Hilaria belangeri</i>	0–4	–
	cane bluestem	BOBA3	<i>Bothriochloa barbinodis</i>	0–3	–
	green sprangletop	LEDU	<i>Leptochloa dubia</i>	0–2	–
3	Annual grasses			5–500	
	mucronate sprangletop	LEPAB	<i>Leptochloa panicea</i> ssp. <i>brachiata</i>	1–200	–
	little barley	HOPU	<i>Hordeum pusillum</i>	1–200	–
	sixweeks fescue	VUOC	<i>Vulpia octoflora</i>	0–150	–
	sticky sprangletop	LEVI5	<i>Leptochloa viscida</i>	0–100	–
	Rothrock's grama	BORO2	<i>Bouteloua rothrockii</i>	0–100	–
	sixweeks threeawn	ARAD	<i>Aristida adscensionis</i>	0–50	–
	feather fingergrass	CHVI4	<i>Chloris virgata</i>	0–50	–
	Mexican panicgrass	PAHI5	<i>Panicum hirticaule</i>	0–50	–
	canyon cupgrass	ERLE7	<i>Eriochloa lemmonii</i>	0–25	–
	needle grama	BOAR	<i>Bouteloua aristidoides</i>	0–25	–
	sixweeks grama	BOBA2	<i>Bouteloua barbata</i>	0–25	–
	Arizona signalgrass	URAR	<i>Urochloa arizonica</i>	0–25	–

	bearded cupgrass	ERAR5	<i>Eriochloa aristata</i>	0–15	–
	Mexican sprangletop	LEFUU	<i>Leptochloa fusca</i> ssp. <i>uninervia</i>	0–10	–
	Bigelow's bluegrass	POBI	<i>Poa bigelovii</i>	0–5	–
	delicate muhly	MUFR	<i>Muhlenbergia fragilis</i>	0–5	–
	littleseed muhly	MUMI	<i>Muhlenbergia microsperma</i>	0–5	–
	Arizona brome	BRAR4	<i>Bromus arizonicus</i>	0–5	–
	prairie threeawn	AROL	<i>Aristida oligantha</i>	0–5	–
	Eastwood fescue	VUMIC	<i>Vulpia microstachys</i> var. <i>ciliata</i>	0–3	–
	tufted lovegrass	ERPEP2	<i>Eragrostis pectinacea</i> var. <i>pectinacea</i>	0–2	–
Forb					
4	Perennial forbs			5–60	
	bluedicks	DICAC5	<i>Dichelostemma capitatum</i> ssp. <i>capitatum</i>	1–20	–
	spear globemallow	SPHA	<i>Sphaeralcea hastulata</i>	1–20	–
	desert globemallow	SPAM2	<i>Sphaeralcea ambigua</i>	0–10	–
	spreading fleabane	ERDI4	<i>Erigeron divergens</i>	0–10	–
	Indian rushpea	HOGL2	<i>Hoffmannseggia glauca</i>	1–10	–
	dwarf desertpeony	ACNA2	<i>Acourtia nana</i>	0–5	–
	redseed plantain	PLRH	<i>Plantago rhodosperma</i>	0–5	–
	buffpetal	RHPH2	<i>Rhynchosida physocalyx</i>	0–5	–
	spreading fanpetals	SIAB	<i>Sida abutifolia</i>	0–5	–
	silverleaf nightshade	SOEL	<i>Solanum elaeagnifolium</i>	0–2	–
	weakleaf bur ragweed	AMCO3	<i>Ambrosia confertiflora</i>	0–2	–
	red-gland spurge	CHME5	<i>Chamaesyce melanadenia</i>	0–2	–
	fingerleaf gourd	CUDI	<i>Cucurbita digitata</i>	0–2	–
	Missouri gourd	CUFO	<i>Cucurbita foetidissima</i>	0–2	–
	coyote gourd	CUPA	<i>Cucurbita palmata</i>	0–2	–
	pricklyburr	DAIN2	<i>Datura inoxia</i>	0–1	–
	desert tobacco	NIOBO	<i>Nicotiana obtusifolia</i> var. <i>obtusifolia</i>	0–1	–
	orange fameflower	PHAU13	<i>Phemeranthus aurantiacus</i>	0–1	–
	canaigre dock	RUHY	<i>Rumex hymenosepalus</i>	0–1	–
	brownplume wirelettuce	STPA4	<i>Stephanomeria pauciflora</i>	0–1	–
5	Annual forbs			5–400	
	coastal bird's-foot trefoil	LOSA	<i>Lotus salsuginosus</i>	0–100	–
	Arizona popcornflower	PLAR	<i>Plagiobothrys arizonicus</i>	0–100	–
	foothill deervetch	LOHU2	<i>Lotus humistratus</i>	0–50	–
	pitseed goosefoot	CHBE4	<i>Chenopodium berlandieri</i>	0–50	–
	California poppy	ESCAM	<i>Eschscholzia californica</i> ssp. <i>mexicana</i>	0–50	–
	wheelscale saltbush	ATEL	<i>Atriplex elegans</i>	0–50	–
	smallflowered milkvetch	ASNU4	<i>Astragalus nuttallianus</i>	0–25	–
	bristly fiddleneck	AMTE3	<i>Amsinckia tessellata</i>	0–25	–
	fringed redmaids	CACI2	<i>Calandrinia ciliata</i>	0–25	–
	Arizona poppy	KAGR	<i>Kallstroemia grandiflora</i>	0–25	–

	desert Indianwheat	PLOV	<i>Plantago ovata</i>	1–25	–
	woolly plantain	PLPA2	<i>Plantago patagonica</i>	0–20	–
	Louisiana vetch	VILU	<i>Vicia ludoviciana</i>	0–20	–
	California desertdandelion	MACA6	<i>Malacothrix californica</i>	0–20	–
	western tansymustard	DEPI	<i>Descurainia pinnata</i>	0–20	–
	carelessweed	AMPA	<i>Amaranthus palmeri</i>	0–20	–
	white easterbonnets	ANLA7	<i>Antheropeas lanosum</i>	0–10	–
	fringed amaranth	AMFI	<i>Amaranthus fimbriatus</i>	0–10	–
	white tackstem	CAWR	<i>Calycoseris wrightii</i>	0–10	–
	miniature woollystar	ERDI2	<i>Eriastrum diffusum</i>	0–10	–
	hyssopleaf sandmat	CHHY3	<i>Chamaesyce hyssopifolia</i>	0–10	–
	Esteve's pincushion	CHST	<i>Chaenactis stevioides</i>	0–10	–
	cryptantha	CRYPT	<i>Cryptantha</i>	0–10	–
	hollowleaf annual lupine	LUSU3	<i>Lupinus succulentus</i>	0–10	–
	mesa tansyaster	MATA	<i>Machaeranthera tagetina</i>	0–10	–
	Lindley's silverpuffs	MILI5	<i>Microseris lindleyi</i>	0–10	–
	Texas stork's bill	ERTE13	<i>Erodium texanum</i>	0–10	–
	distant phacelia	PHDI	<i>Phacelia distans</i>	0–10	–
	purslane	PORTU	<i>Portulaca</i>	0–10	–
	Nuttall's povertyweed	MONU	<i>Monolepis nuttalliana</i>	0–10	–
	Arizona phacelia	PHAR13	<i>Phacelia arizonica</i>	0–10	–
	cleftleaf wildheliotrope	PHCR	<i>Phacelia crenulata</i>	0–5	–
	New Mexico plumeseed	RANE	<i>Rafinesquia neomexicana</i>	0–5	–
	Lemmon's ragwort	SELE8	<i>Senecio lemmonii</i>	0–5	–
	Coulter's globemallow	SPCO2	<i>Sphaeralcea coulteri</i>	0–5	–
	California mustard	GULA4	<i>Guillenia lasiophylla</i>	0–5	–
	California goldfields	LACAC2	<i>Lasthenia californica</i> ssp. <i>californica</i>	0–5	–
	flatspine stickseed	LAOCO	<i>Lappula occidentalis</i> var. <i>occidentalis</i>	0–5	–
	Gordon's bladderpod	LEGO	<i>Lesquerella gordonii</i>	0–5	–
	American wild carrot	DAPU3	<i>Daucus pusillus</i>	0–5	–
	red-gland spurge	CHME5	<i>Chamaesyce melanadenia</i>	0–5	–
	yellow tackstem	CAPA7	<i>Calycoseris parryi</i>	0–5	–
	spreading fleabane	ERDI4	<i>Erigeron divergens</i>	0–5	–
	wedgeleaf draba	DRCU	<i>Draba cuneifolia</i>	0–5	–
	California suncup	CACA32	<i>Camissonia californica</i>	0–5	–
	New Mexico thistle	CINE	<i>Cirsium neomexicanum</i>	0–2	–
	star gilia	GIST	<i>Gilia stellata</i>	0–2	–
	sand fringe pod	THCU	<i>Thysanocarpus curvipes</i>	0–2	–
	Fendler's horsenettle	SOFE	<i>Solanum fendleri</i>	0–1	–
	doubleclaw	PRPA2	<i>Proboscidea parviflora</i>	0–1	–
	redseed plantain	PLRH	<i>Plantago rhodosperma</i>	0–1	–
	shaggyfruit pepperweed	LELA	<i>Lepidium lasiocarpum</i>	0–1	–
	Mojave desertstar	MOBE2	<i>Monoptilon bellioides</i>	0–1	–

	tanseyleaf tansyaster	MATA2	<i>Machaeranthera tanacetifolia</i>	0–1	–
	disc mayweed	MADI6	<i>Matricaria discoidea</i>	0–1	–
	slender goldenweed	MAGR10	<i>Machaeranthera gracilis</i>	0–1	–
	Palmer's spectaclepod	DICA31	<i>Dimorphocarpa candicans</i>	0–1	–
	touristplant	DIWI2	<i>Dimorphocarpa wislizeni</i>	0–1	–
	Mexican fireplant	EUHE4	<i>Euphorbia heterophylla</i>	0–1	–
	hoary bowlesia	BOIN3	<i>Bowlesia incana</i>	0–1	–
	common fiddleneck	AMMEI2	<i>Amsinckia menziesii</i> var. <i>intermedia</i>	0–1	–
	desert tobacco	NIOBO	<i>Nicotiana obtusifolia</i> var. <i>obtusifolia</i>	0–1	–
	desert evening primrose	OEPR	<i>Oenothera primiveris</i>	0–1	–
	Florida pellitory	PAFL3	<i>Parietaria floridana</i>	0–1	–
	manybristle chinchweed	PEPA2	<i>Pectis papposa</i>	0–1	–
Shrub/Vine					
6	Misc shrubs			0–10	
	fairyduster	CAER	<i>Calliandra eriophylla</i>	0–2	–
	spiny hackberry	CEEH	<i>Celtis ehrenbergiana</i>	0–2	–
	snakewood	CONDA	<i>Condalia</i>	0–2	–
	soaptree yucca	YUEL	<i>Yucca elata</i>	0–2	–
	lotebush	ZIOB	<i>Ziziphus obtusifolia</i>	0–1	–
	Nevada jointfir	EPNE	<i>Ephedra nevadensis</i>	0–1	–
	water jacket	LYAN	<i>Lycium andersonii</i>	0–1	–
	Berlandier's wolfberry	LYBE	<i>Lycium berlandieri</i>	0–1	–
	Arizona desert-thorn	LYEX	<i>Lycium exsertum</i>	0–1	–
	pale desert-thorn	LYPA	<i>Lycium pallidum</i>	0–1	–
	rough menodora	MESC	<i>Menodora scabra</i>	0–1	–
	whitethorn acacia	ACCO2	<i>Acacia constricta</i>	0–1	–
	catclaw acacia	ACGR	<i>Acacia greggii</i>	0–1	–
	fourwing saltbush	ATCA2	<i>Atriplex canescens</i>	0–1	–
	crucifixion thorn	CAEM4	<i>Castela emoryi</i>	0–1	–
7	Succulents			1–20	
	walkingstick cactus	CYSP8	<i>Cylindropuntia spinosior</i>	0–5	–
	dollarjoint pricklypear	OPCH	<i>Opuntia chlorotica</i>	0–5	–
	cactus apple	OPEN3	<i>Opuntia engelmannii</i>	0–5	–
	staghorn cholla	CYVE3	<i>Cylindropuntia versicolor</i>	0–1	–
	Engelmann's hedgehog cactus	ECEN	<i>Echinocereus engelmannii</i>	0–1	–
	candy barrelcactus	FEWI	<i>Ferocactus wislizeni</i>	0–1	–
	devil's cholla	GRKU	<i>Grusonia kunzei</i>	0–1	–
	buck-horn cholla	CYAC8	<i>Cylindropuntia acanthocarpa</i>	0–1	–
	Arizona pencil cholla	CYAR14	<i>Cylindropuntia arbuscula</i>	0–1	–
	jumping cholla	CYFU10	<i>Cylindropuntia fulgida</i>	0–1	–
	Christmas cactus	CYLE8	<i>Cylindropuntia leptocaulis</i>	0–1	–
Tree					
8	Trees			0–10	

	velvet mesquite	PRVE	<i>Prosopis velutina</i>	0–10	–
	blue paloverde	PAFL6	<i>Parkinsonia florida</i>	0–2	–
	yellow paloverde	PAMI5	<i>Parkinsonia microphylla</i>	0–2	–

Animal community

The plant community on this site is suitable for grazing by all classes of cattle. Tobosa grass is very unpalatable when cured and dormant and best use is made of this species in either spring or summer growing seasons. Prescribed burning or mowing can be used to freshen old growth tobosa grass. Burning should only be done in February or March and only in years with good enough winter rainfall for soils to have 3 inches of available moisture in the profile. Spring regrowth should then be rested until the first summer flood. The plant community will be deficient in digestible protein in the fall or winter.

This site is mainly a foraging area for large wildlife species. Free water is usually available in the summer rainy season in natural charcos and discontinuous gullies. Being open grassland, this site is home to a variety of small wildlife species and their predators.

Hydrological functions

When dry, these soils produce little runoff due to cracks and depressions that hold water. When wet they produce good amounts of runoff due to heavy soil textures and swelling to seal cracks and holes.

Recreational uses

Hunting, hiking, horseback riding, photography, camping

Wood products

Little to nothing except in areas where mesquite has increased. In areas heavily invaded by mesquite good supplies of fuelwood are available.

Other products

Grass nuts, hog potatoes, prickly pear tunas and clay.

Inventory data references

Range 417s include 2 in fair condition.

Type locality

Location 1: Pima County, AZ	
Township/Range/Section	T9S R2E S7
General legal description	SELLS FIELD OFFICE - HICKIWAN DIST. HEADWATERS OF THE VEKOL VALLEY
Location 2: Pima County, AZ	
Township/Range/Section	T16S R15E S14
General legal description	TUCSON FIELD OFFICE - PIMA COUNTY FAIRGROUNDS

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)	
Contact for lead author	
Date	
Approved by	
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

Indicators

1. **Number and extent of rills:**

2. **Presence of water flow patterns:**

3. **Number and height of erosional pedestals or terracettes:**

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

5. **Number of gullies and erosion associated with gullies:**

6. **Extent of wind scoured, blowouts and/or depositional areas:**

7. **Amount of litter movement (describe size and distance expected to travel):**

8. **Soil surface (top few mm) resistance to erosion (stability values are averages - most sites will show a range of values):**

9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):**

10. **Effect of community phase composition (relative proportion of different functional groups) and spatial**

distribution on infiltration and runoff:

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

12. **Functional/Structural Groups (list in order of descending dominance by above-ground annual-production or live foliar cover using symbols: >>, >, = to indicate much greater than, greater than, and equal to):**

Dominant:

Sub-dominant:

Other:

Additional:

13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):**
-

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

15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):**
-

16. **Potential invasive (including noxious) species (native and non-native). List species which BOTH characterize degraded states and have the potential to become a dominant or co-dominant species on the ecological site if their future establishment and growth is not actively controlled by management interventions. Species that become dominant for only one to several years (e.g., short-term response to drought or wildfire) are not invasive plants. Note that unlike other indicators, we are describing what is NOT expected in the reference state for the ecological site:**
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17. **Perennial plant reproductive capability:**
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