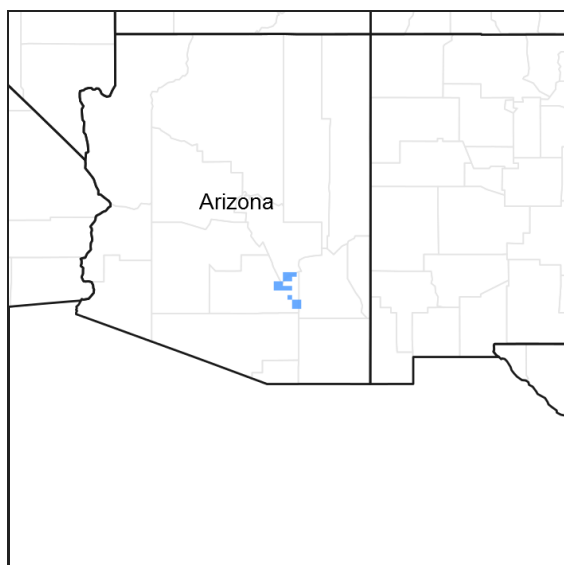


## **Ecological site R040XA103AZ** **Clayey Slopes 10"-13" p.z.**

Accessed: 05/13/2025

### 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

R040XA101AZ	<b>Basalt Hills 10"-13" p.z.</b>
R040XA110AZ	<b>Limy Slopes 10"-13" p.z.</b>
R040XA113AZ	<b>Loamy Slopes 10"-13" p.z.</b>
R040XA123AZ	<b>Volcanic Hills 10"-13" P.Z.</b>

## Similar sites

R038XA108AZ	Clayey Slopes 12-16" p.z.
R041XC303AZ	Clayey Slopes 12-16" p.z.

Table 1. Dominant plant species

Tree	(1) <i>Parkinsonia microphylla</i>
Shrub	(1) <i>Calliandra eriophylla</i> (2) <i>Simmondsia chinensis</i>
Herbaceous	(1) <i>Pleuraphis mutica</i> (2) <i>Hilaria belangeri</i>

## Physiographic features

This site occurs in the upper elevations of the Sonoran Desert in southern Arizona. Slope aspect is site differentiating at elevations near common resource area boundaries.

Table 2. Representative physiographic features

Landforms	(1) Hill (2) Ridge
Flooding frequency	None
Ponding frequency	None
Elevation	671–1,067 m
Slope	15–45%
Aspect	N, E, S

## 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 to shallow soils which have formed in gravelly, clayey alluvium and colluvium, or in place on shale. Soil surfaces are well protected by gravels and rocks. They are non calcareous, but calcareous horizons or bedrock can occur at moderate to shallow depths. Plant-soil moisture relationships are between good. Soil mapped on this site include: SSA-661 Eastern Pinal/Southern Gila Counties MU Granolite-465.

**Table 4. Representative soil features**

Surface texture	(1) Very gravelly sandy loam (2) Cobbly sandy loam (3) Very gravelly loam
Family particle size	(1) Clayey
Drainage class	Well drained
Permeability class	Moderately slow to slow
Soil depth	51–152 cm
Surface fragment cover <=3"	20–60%
Surface fragment cover >3"	5–20%
Available water capacity (0-101.6cm)	7.62–17.78 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)	7.4–8.4
Subsurface fragment volume <=3" (Depth not specified)	30–60%
Subsurface fragment volume >3" (Depth not specified)	0–10%

## 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.

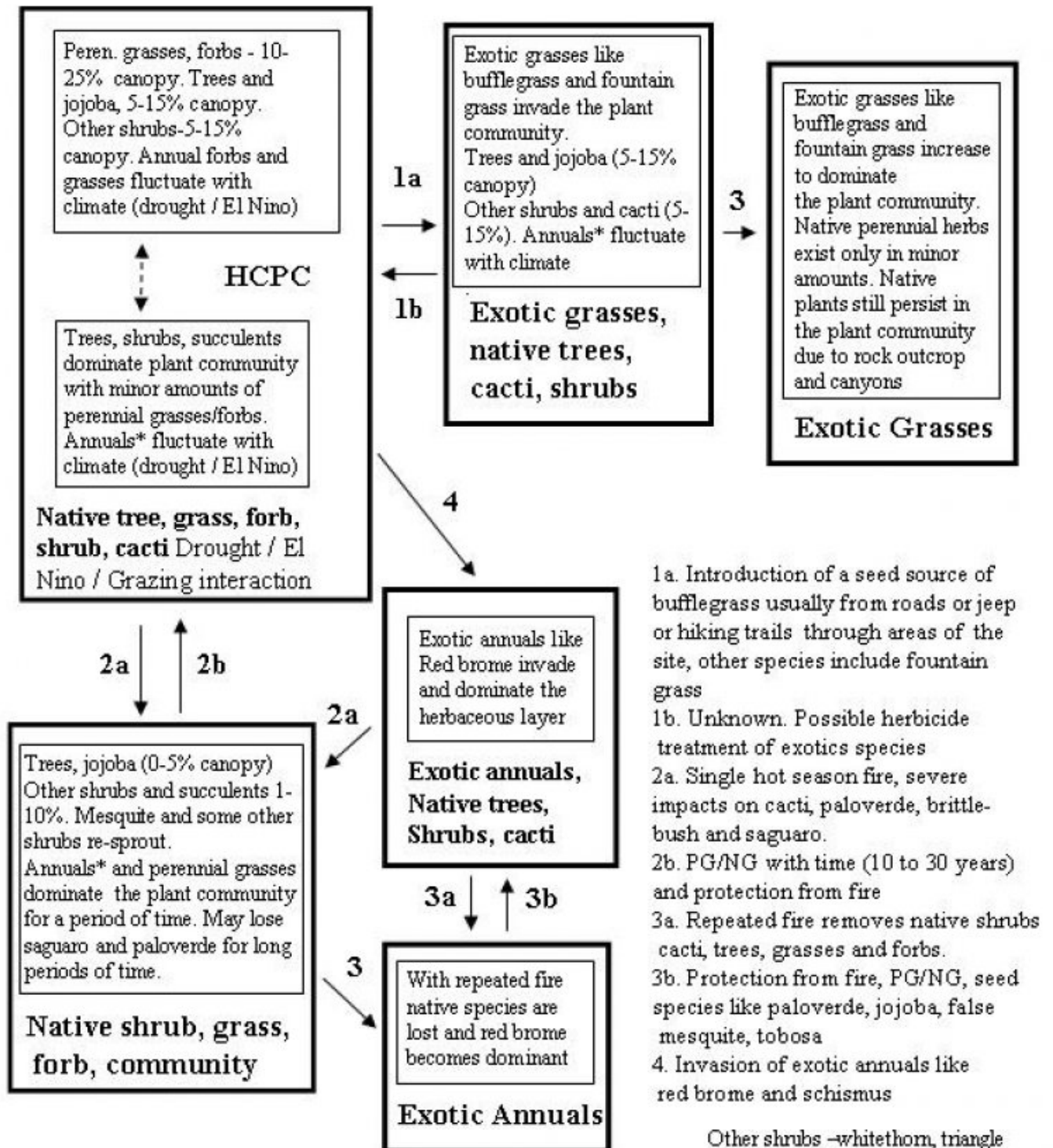
Production data provided in this site description is standardized to air dry weight at the end of the summer growing season. The plant communities described in this site description are based on near normal rainfall years.

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 Slopes



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

Other shrubs -whitethorn, triangle bursage, brittlebush, wolfberry, ocotillo, false mesquite, mormon tea  
Trees - ironwood, mesquite, paloverde

## State 1

### Historic Climax Plant Community

#### Community 1.1

##### Historic Climax Plant Community

The potential plant community on this site is an even mixture of desert shrubs, trees, cacti and perennial grasses. Annual forbs and grasses can be abundant in wet seasons. The aspect is a shrub dotted grassland. The combination of drought, fire and continuous grazing can deplete the dominant species tobosa grass. As the cover of tobosa declines curly mesquite will increase to dominate but will diminish again greatly in drought. As the perennial grass cover is thinned and shrubs like snakeweed, prickley pear and turpentine bush can increase to dominate the overstory. Jojoba is stable on the site unless repeated fires remove it. Trees tend to be shrubby on the site due to clayey textures at nor near the surface.

Table 5. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Grass/Grasslike	58	280	706
Shrub/Vine	84	224	375
Forb	12	34	224
Tree	17	56	112
<b>Total</b>	<b>171</b>	<b>594</b>	<b>1417</b>

Table 6. Soil surface cover

Tree basal cover	0-1%
Shrub/vine/liana basal cover	1-3%
Grass/grasslike basal cover	1-2%
Forb basal cover	0-1%
Non-vascular plants	0%
Biological crusts	0-5%
Litter	15-75%
Surface fragments >0.25" and <=3"	30-75%
Surface fragments >3"	1-30%
Bedrock	0%
Water	0%
Bare ground	5-50%

Table 7. Canopy structure (% cover)

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

### Native trees, shrubs, cacti and grass with fire

#### Community 2.1

##### Native trees, shrubs, cacti and grass with fire

This plant community occurs as a result of a single hot season fire. Paloverde 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 jojoba and triangle bursage can recover. 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 3

### Exotic perennial grasses with natives

#### Community 3.1

##### Exotic perennial grasses with natives

This community occurs where buffleggrass, natal grass or fountain grass invade the native plant community. These species occupy the niches of low shrubs like triangle bursage, grasses like tobosa and curley mesquite and woody forbs like janusia and twinberry.

## State 4

### Exotic perennial grasses and fire

#### Community 4.1

##### Exotic perennial grasses and fire

This community occurs where a native plant community that has been invaded by buffleggrass has burned one or more times. Increasing amounts of buffleggrass 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 5

### Native plant community with exotic annuals

#### Community 5.1

##### Native plant community with exotic annuals

This plant community occurs where the native community has been invaded by red brome, filaree and / or schismus. Red brome occupies the niche of the native winter annual forbs and grasses. This exotic annual grass will fluctuate from nearly nothing in a dry winter to dominance of the understory plant community in a El Nino winter.

## State 6

### Exotic annuals and fire

#### Community 6.1

##### Exotic annuals and fire

This plant community occurs where a native plant community which has been invaded by red brome and / or schismus has burned repeatedly. As fires become more frequent the native trees, shrubs and succulents are removed from the plant community and red brome becomes dominant. In areas of the site near urban areas and along heavily travelled roads this will be a more common occurrence due to an increased source of ignitions.

### Additional community tables

Table 8. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Kg/Hectare)	Foliar Cover (%)
<b>Grass/Grasslike</b>					
1	<b>Dominant mid grass</b>			56–336	
	tobosagrass	PLMU3	<i>Pleuraphis mutica</i>	56–336	–
2	<b>Dominant short grass</b>			1–112	
	curly-mesquite	HIBE	<i>Hilaria belangeri</i>	1–112	–
3	<b>Misc perennial grasses</b>			0–34	
	purple threeawn	ARPU9	<i>Aristida purpurea</i>	0–22	–
	sideoats grama	BOCU	<i>Bouteloua curtipendula</i>	0–17	–
	tanglehead	HECO10	<i>Heteropogon contortus</i>	0–11	–
	Parish's threeawn	ARPUP5	<i>Aristida purpurea</i> var. <i>parishii</i>	0–11	–
	spidergrass	ARTE3	<i>Aristida ternipes</i>	0–11	–
	spidergrass	ARTEG	<i>Aristida ternipes</i> var. <i>gentilis</i>	0–11	–
	cane bluestem	BOBA3	<i>Bothriochloa barbinodis</i>	0–6	–
	squirreltail	ELELE	<i>Elymus elymoides</i> ssp. <i>elymoides</i>	0–2	–
4	<b>Annual grasses</b>			1–224	
	sixweeks threeawn	ARAD	<i>Aristida adscensionis</i>	1–112	–
	mucronate sprangeltop	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	–
	little barley	HOPU	<i>Hordeum pusillum</i>	0–56	–
	Pacific fescue	VUMIP	<i>Vulpia microstachys</i> var. <i>pauciflora</i>	0–17	–
	prairie threeawn	AROL	<i>Aristida oligantha</i>	0–11	–
	needle grama	BOAR	<i>Bouteloua aristidoides</i>	0–11	–

	Rothrock's grama	BORO2	<i>Bouteloua rothrockii</i>	0–11	–
	sixweeks grama	BOBA2	<i>Bouteloua barbata</i>	0–6	–
	Mexican sprangletop	LEFUU	<i>Leptochloa fusca ssp. uninervia</i>	0–6	–
	Bigelow's bluegrass	POBI	<i>Poa bigelovii</i>	0–6	–
	delicate muhly	MUFR	<i>Muhlenbergia fragilis</i>	0–2	–
	littleseed muhly	MUMI	<i>Muhlenbergia microsperma</i>	0–2	–
	Arizona brome	BRAR4	<i>Bromus arizonicus</i>	0–1	–
	feather fingergrass	CHVI4	<i>Chloris virgata</i>	0–1	–
<b>Forb</b>					
5	<b>Perennial forbs</b>			11–56	
	slender janusia	JAGR	<i>Janusia gracilis</i>	1–17	–
	desert globemallow	SPAM2	<i>Sphaeralcea ambigua</i>	1–17	–
	brownplume wirelettuce	STPA4	<i>Stephanomeria pauciflora</i>	0–11	–
	bluedicks	DICA14	<i>Dichelostemma capitatum</i>	0–11	–
	spreading fleabane	ERDI4	<i>Erigeron divergens</i>	0–6	–
	largeflower onion	ALMA4	<i>Allium macropetalum</i>	0–6	–
	weakleaf bur ragweed	AMCO3	<i>Ambrosia confertiflora</i>	1–6	–
	tuber anemone	ANTU	<i>Anemone tuberosa</i>	1–6	–
	lacy tansyaster	MAPIP4	<i>Machaeranthera pinnatifida ssp. pinnatifida</i> var. <i>pinnatifida</i>	0–6	–
	slender poreleaf	POGR5	<i>Porophyllum gracile</i>	0–6	–
	glandleaf milkwort	POMA7	<i>Polygala macradenia</i>	0–2	–
	wishbone-bush	MILAV	<i>Mirabilis laevis</i> var. <i>villosa</i>	0–2	–
	red-gland spurge	CHME5	<i>Chamaesyce melanadenia</i>	0–2	–
	dwarf desertpeony	ACNA2	<i>Acourtia nana</i>	0–2	–
	brownfoot	ACWR5	<i>Acourtia wrightii</i>	0–1	–
	San Felipe dogweed	ADPO	<i>Adenophyllum porophylloides</i>	0–1	–
	spearleaf	MAPA9	<i>Matelea parvifolia</i>	0–1	–
	desert rosemallow	HICO	<i>Hibiscus coulteri</i>	0–1	–
	Indian rushpea	HOGL2	<i>Hoffmannseggia glauca</i>	0–1	–
	leatherweed	CRPOP	<i>Croton pottsii</i> var. <i>pottsii</i>	0–1	–
	desert larkspur	DEPA	<i>Delphinium parishii</i>	0–1	–
	tall mountain larkspur	DESC	<i>Delphinium scaposum</i>	0–1	–
	Braun's rockcress	ARPE3	<i>Arabis perstellata</i>	0–1	–
	dense ayenia	AYMI	<i>Ayenia microphylla</i>	0–1	–
	desert tobacco	NIOBO	<i>Nicotiana obtusifolia</i> var. <i>obtusifolia</i>	0–1	–
	Parry's beardtongue	PEPA24	<i>Penstemon parryi</i>	0–1	–
	orange fameflower	PHAU13	<i>Phemeranthus aurantiacus</i>	0–1	–
	Coues' cassia	SECO10	<i>Senna covesii</i>	0–1	–
	spreading fanpetals	SIAB	<i>Sida abutifolia</i>	0–1	–
	silverleaf nightshade	SOEL	<i>Solanum elaeagnifolium</i>	0–1	–
	Coulter's wrinklefruit	TECO	<i>Tetradlea coulteri</i>	0–1	–
	caliche globemallow	SPLA	<i>Sphaeralcea laxa</i>	0–1	–
	Palmer's Indian mallow	ABPA	<i>Abutilon palmeri</i>	0–1	–



6	<b>Annual forbs</b>			1–168	
	California poppy	ESCAM	<i>Eschscholzia californica</i> ssp. <i>mexicana</i>	0–112	–
	coastal bird's-foot trefoil	LOSA	<i>Lotus salsuginosus</i>	0–56	–
	western tansymustard	DEPI	<i>Descurainia pinnata</i>	0–56	–
	Arizona popcornflower	PLAR	<i>Plagiobothrys arizonicus</i>	0–56	–
	smallflowered milkvetch	ASNU4	<i>Astragalus nuttallianus</i>	0–34	–
	shaggyfruit pepperweed	LELA	<i>Lepidium lasiocarpum</i>	0–34	–
	Arizona poppy	KAGR	<i>Kallstroemia grandiflora</i>	0–34	–
	fringed redmaids	CACI2	<i>Calandrinia ciliata</i>	0–28	–
	pitseed goosefoot	CHBE4	<i>Chenopodium berlandieri</i>	0–28	–
	bristly fiddleneck	AMTE3	<i>Amsinckia tessellata</i>	0–28	–
	desert Indianwheat	PLOV	<i>Plantago ovata</i>	0–22	–
	New Mexico plumeseed	RANE	<i>Rafinesquia neomexicana</i>	0–22	–
	mesa tansyaster	MATA	<i>Machaeranthera tagetina</i>	0–17	–
	tanseyleaf tansyaster	MATA2	<i>Machaeranthera tanacetifolia</i>	0–17	–
	woolly plantain	PLPA2	<i>Plantago patagonica</i>	0–17	–
	combseed	PECTO	<i>Pectocarya</i>	0–17	–
	distant phacelia	PHDI	<i>Phacelia distans</i>	0–17	–
	thelypody	THELY	<i>Thelypodium</i>	0–17	–
	Louisiana vetch	VILU	<i>Vicia ludoviciana</i>	0–17	–
	fringed amaranth	AMFI	<i>Amaranthus fimbriatus</i>	0–17	–
	carelessweed	AMPA	<i>Amaranthus palmeri</i>	0–17	–
	wedgeleaf draba	DRCU	<i>Draba cuneifolia</i>	0–17	–
	Abert's buckwheat	ERAB2	<i>Eriogonum abertianum</i>	0–17	–
	miniature woollystar	ERDI2	<i>Eriastrum diffusum</i>	0–17	–
	foothill deervetch	LOHU2	<i>Lotus humistratus</i>	0–17	–
	California desertydandelion	MACA6	<i>Malacothrix californica</i>	0–11	–
	Esteve's pincushion	CHST	<i>Chaenactis stevioides</i>	0–11	–
	pincushion flower	CHFR	<i>Chaenactis fremontii</i>	0–11	–
	yellow tackstem	CAPA7	<i>Calycoseris parryi</i>	0–11	–
	white tackstem	CAWR	<i>Calycoseris wrightii</i>	0–11	–
	sleepy silene	SIAN2	<i>Silene antirrhina</i>	0–11	–
	Lindley's silverpuffs	MILI5	<i>Microseris lindleyi</i>	0–11	–
	Nuttall's povertyweed	MONU	<i>Monolepis nuttalliana</i>	0–6	–
	desert evening primrose	OEPR	<i>Oenothera primiveris</i>	0–6	–
	manybristle chinchweed	PEPA2	<i>Pectis papposa</i>	0–6	–
	Arizona phacelia	PHAR13	<i>Phacelia arizonica</i>	0–6	–
	cleftleaf wildheliotrope	PHCR	<i>Phacelia crenulata</i>	0–6	–
	whitestem blazingstar	MEAL6	<i>Mentzelia albicaulis</i>	0–6	–
	Sonoran sandmat	CHMI7	<i>Chamaesyce micromera</i>	0–6	–
	cruciantha	CPVBT	<i>Cruciantha</i>	0–6	–

	Cryptantha	CRYPT	Cryptantha	0-6	-
	American wild carrot	DAPU3	<i>Daucus pusillus</i>	0-6	-
	Thurber's buckwheat	ERTH3	<i>Eriogonum thurberi</i>	0-6	-
	slender goldenweed	MAGR10	<i>Machaeranthera gracilis</i>	0-6	-
	Coulter's lupine	LUSP2	<i>Lupinus sparsiflorus</i>	0-6	-
	California suncup	CACA32	<i>Camissonia californica</i>	0-6	-
	Goodding's bladderpod	LEGO2	<i>Lesquerella gooddingii</i>	0-6	-
	star gilia	GIST	<i>Gilia stellata</i>	0-6	-
	New Mexico thistle	CINE	<i>Cirsium neomexicanum</i>	0-3	-
	goosefoot	CHENO	<i>Chenopodium</i>	1-3	-
	hoary bowlesia	BOIN3	<i>Bowlesia incana</i>	0-2	-
	sand pygmyweed	CRCOC	<i>Crassula connata</i> var. <i>connata</i>	0-2	-
	dainty desert hideseed	EUMI2	<i>Eucrypta micrantha</i>	0-2	-
	Arizona cottonrose	LOAR12	<i>Logfia arizonica</i>	0-2	-
	limestone bedstraw	GAPR	<i>Galium proliferum</i>	0-1	-
	Mexican fireplant	EUHE4	<i>Euphorbia heterophylla</i>	0-1	-
	California mustard	GULA4	<i>Guillenia lasiophylla</i>	0-1	-
	Lemmon's ragwort	SELE8	<i>Senecio lemmonii</i>	0-1	-
	doubleclaw	PRPA2	<i>Proboscidea parviflora</i>	0-1	-
	Florida pellitory	PAFL3	<i>Parietaria floridana</i>	0-1	-
<b>Shrub/Vine</b>					
7	<b>Dominant half shrubs</b>			17-84	
	fairyduster	CAER	<i>Calliandra eriophylla</i>	17-28	-
	Eastern Mojave buckwheat	ERFA2	<i>Eriogonum fasciculatum</i>	0-17	-
	triangle bur ragweed	AMDE4	<i>Ambrosia deltoidea</i>	0-17	-
	bastardsage	ERWR	<i>Eriogonum wrightii</i>	0-11	-
	brittlebush	ENFA	<i>Encelia farinosa</i>	0-11	-
	button brittlebush	ENFR	<i>Encelia frutescens</i>	0-11	-
	littleleaf ratany	KRER	<i>Krameria erecta</i>	0-11	-
	rough menodora	MESC	<i>Menodora scabra</i>	0-11	-
	Parish's goldeneye	VIPA14	<i>Viguiera parishii</i>	0-11	-
	broom snakeweed	GUSA2	<i>Gutierrezia sarothrae</i>	0-6	-
	white ratany	KRGR	<i>Krameria grayi</i>	0-2	-
8	<b>Dominant large shrubs</b>			56-224	
	jojoba	SICH	<i>Simmondsia chinensis</i>	45-168	-
	whitethorn acacia	ACCO2	<i>Acacia constricta</i>	0-22	-
	catclaw acacia	ACGR	<i>Acacia greggii</i>	6-22	-
	ocotillo	FOSP2	<i>Fouquieria splendens</i>	0-17	-
	pelotazo	ABIN	<i>Abutilon incanum</i>	0-6	-
9	<b>Misc shrubs</b>			0-6	
	banana yucca	YUBA	<i>Yucca baccata</i>	0-6	-
	Berlandier's wolfberry	LYBE	<i>Lycium berlandieri</i>	0-2	-
	Warnock's snakewood	COWA	<i>Condalia warnockii</i>	0-2	-
	Nevada jointfir	EDNE	<i>Ephedra nevadensis</i>	0-1	-

	<i>Nevada juncea</i>	ERL12	<i>Ericameria laricifolia</i>	0–1	–
	turpentine bush	ERLA12	<i>Ericameria laricifolia</i>	0–1	–
	sangre de cristo	JACA2	<i>Jatropha cardiophylla</i>	0–1	–
	rayless goldenhead	ACSP	<i>Acamptopappus sphaerocephalus</i>	0–1	–
	Wright's beebrush	ALWR	<i>Aloysia wrightii</i>	0–1	–
	lotebush	ZIOB	<i>Ziziphus obtusifolia</i>	0–1	–
10	<b>Succulents</b>			11–62	
	cactus apple	OPEN3	<i>Opuntia engelmannii</i>	6–34	–
	saguaro	CAGI10	<i>Carnegiea gigantea</i>	0–22	–
	buck-horn cholla	CYAC8	<i>Cylindropuntia acanthocarpa</i>	1–17	–
	walkingstick cactus	CYSP8	<i>Cylindropuntia spinosior</i>	1–11	–
	staghorn cholla	CYVE3	<i>Cylindropuntia versicolor</i>	0–6	–
	jumping cholla	CYFU10	<i>Cylindropuntia fulgida</i>	0–6	–
	purple pricklypear	OPMA8	<i>Opuntia macrocentra</i>	0–6	–
	tulip pricklypear	OPPH	<i>Opuntia phaeacantha</i>	0–6	–
	Christmas cactus	CYLE8	<i>Cylindropuntia leptocaulis</i>	0–2	–
	candy barrelcactus	FEWI	<i>Ferocactus wislizeni</i>	0–2	–
	desert agave	AGDE	<i>Agave deserti</i>	0–2	–
	Arizona pencil cholla	CYAR14	<i>Cylindropuntia arbuscula</i>	0–1	–
	Graham's nipple cactus	MAGR9	<i>Mammillaria grahamii</i>	0–1	–
	Engelmann's hedgehog cactus	ECEN	<i>Echinocereus engelmannii</i>	0–1	–
	pinkflower hedgehog cactus	ECFA	<i>Echinocereus fasciculatus</i>	0–1	–
	spiny star	ESVI2	<i>Escobaria vivipara</i>	0–1	–
<b>Tree</b>					
11	<b>Trees</b>			17–112	
	yellow paloverde	PAMI5	<i>Parkinsonia microphylla</i>	11–112	–
	velvet mesquite	PRVE	<i>Prosopis velutina</i>	0–22	–
	blue paloverde	PAFL6	<i>Parkinsonia florida</i>	0–11	–

## Animal community

Steep slopes and cobbly or gravelly surfaces limit grazing distribution especially in the hotter months of the year. Stocker cattle will use areas of this site fairly well at any season. Forage species grow year-round with available moisture. The plant community provides adequate nutrition for livestock throughout the year.

Water developments are very important to wildlife species on this site. Even though vegetative cover is lacking, rugged topography and forage diversity make the site home to a great variety of wildlife including the larger desert mammals.

## Hydrological functions

This site is a good producer of runoff due to steep slopes and soils with argillic horizons near the surface. Very gravelly and cobbly soil surfaces tend to hold water on the site.

## Recreational uses

Hunting, hiking, birdwatching, photography, horseback riding, rock hounding.

## Wood products

Some paloverde, catclaw and mesquite for camp-fires and branding fires.

## Other products

Stones and cobbles, clay, saguaro ribs, cholla skeletons. Traditional foods like saguaro fruits, prickly pear tunas, cactus flower buds, grass nuts and jojoba nuts. Traditional herbs like globe mallow, wild onion and anemone.

## Type locality

Location 1: Pima County, AZ	
Township/Range/Section	T9S R18E S15
General legal description	TUCSON FIELD OFFICE - RAFTER T RANCH
Location 2: Pima County, AZ	
General legal description	SELLS FIELD OFFICE - BABOQUIVARI DIST. NEAR FRESNAL VILLAGE - UNSURVEYED 111 DEGREES 41' X 31 DEGREES 48' 30"
Location 3: Pima County, AZ	
Township/Range/Section	T14S R13E S15
General legal description	Tumamoc Hill, UA Desert Laboratory, inclusions of Lehman's soil in the Basalt Hills complex.

## 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:

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### 2. Presence of water flow patterns:

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

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

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

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

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

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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):**

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

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10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:**

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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):**

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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:

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):**

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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):**

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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:**

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17. **Perennial plant reproductive capability:**

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