

Ecological site R040XA115AZ **Sandy Wash 10"-13" p.z.**

Accessed: 05/11/2025

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.

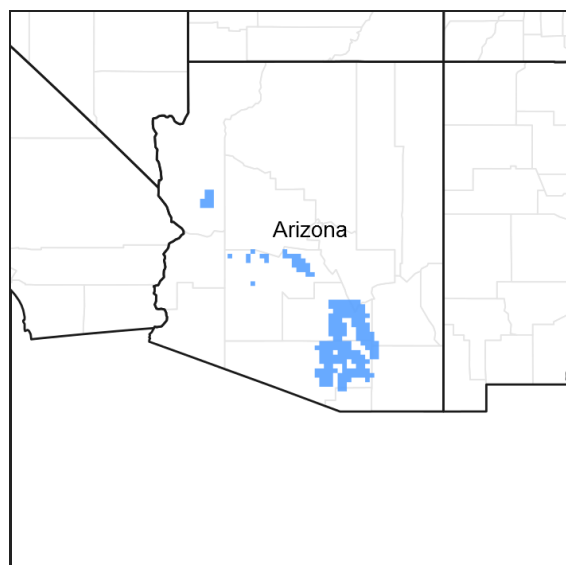


Figure 1. Mapped extent

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

R040XA114AZ	Loamy Upland 10"-13" p.z.
R040XA116AZ	Sandy Upland 10"-13" p.z.
R040XA117AZ	Sandy Loam Upland, Deep 10"-13" p.z.
R040XA118AZ	Sandy Loam Upland 10"-13" p.z.

Similar sites

R041XB213AZ	Sandy Wash 8-12" p.z.
R041XC316AZ	Sandy Wash 12-16" p.z.
R040XB216AZ	Sandy Wash 7"-10" p.z.

Table 1. Dominant plant species

Tree	(1) <i>Parkinsonia florida</i> (2) <i>Prosopis velutina</i>
Shrub	(1) <i>Ambrosia ambrosioides</i>
Herbaceous	(1) <i>Muhlenbergia porteri</i> (2) <i>Sphaeralcea ambigua</i>

Physiographic features

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

Table 2. Representative physiographic features

Landforms	(1) Alluvial fan (2) Flood plain (3) Stream terrace
Flooding duration	Very brief (4 to 48 hours) to brief (2 to 7 days)
Flooding frequency	Rare to occasional
Ponding duration	Very brief (4 to 48 hours) to brief (2 to 7 days)
Ponding frequency	None to rare
Elevation	1,900–3,300 ft
Slope	0–3%
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)	13 in

Influencing water features

There are no water features associated with this site.

Soil features

These are very young soils on gravelly and sandy alluvium of mixed origin. They are deep and excessively well drained. Textures range from sandy loam to very gravelly sands. Although coarse textures make for low water holding capacities, plant-soil moisture relationships are good due to the extra moisture the soils receive. They may or may not be calcareous.

Soils mapped on this site include: in

SSA-627 Southern Mohave County MU Anthony-7;

SSA-645 Aguilla-Carefree MU's Arizo-6, 7 & 8, Anthony-121;

SSA-661 Eastern Pinal Southern Gila counties MU Queencreek-295;

SSA-666 MU Queencreek-200; SSA-668 Tucson Avra Valley MU's Anthony-AhA, AnA, AnB, ApB, AsB & Vu, Arizo-Az, Brazito-Br, BsB & Bt, Comoro-Cm & Co, Gravelly Alluvial Land-Gr & VgB, Vinton-VsA & Vu;

SSA-669 Eastern Pima county MU's Anthony-3 & Arizo-5.

Table 4. Representative soil features

Surface texture	(1) Very gravelly sandy loam (2) Fine sandy loam (3) Very gravelly loamy sand
Family particle size	(1) Sandy
Drainage class	Somewhat excessively drained to well drained
Permeability class	Rapid to moderately rapid
Soil depth	60 in
Surface fragment cover <=3"	5–40%
Surface fragment cover >3"	0–5%
Available water capacity (0-40in)	3–6 in
Calcium carbonate equivalent (0-40in)	0–5%
Electrical conductivity (0-40in)	0–2 mmhos/cm
Sodium adsorption ratio (0-40in)	0–2
Soil reaction (1:1 water) (0-40in)	7.4–8.4
Subsurface fragment volume <=3" (Depth not specified)	0–65%
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"), Sandy Wash

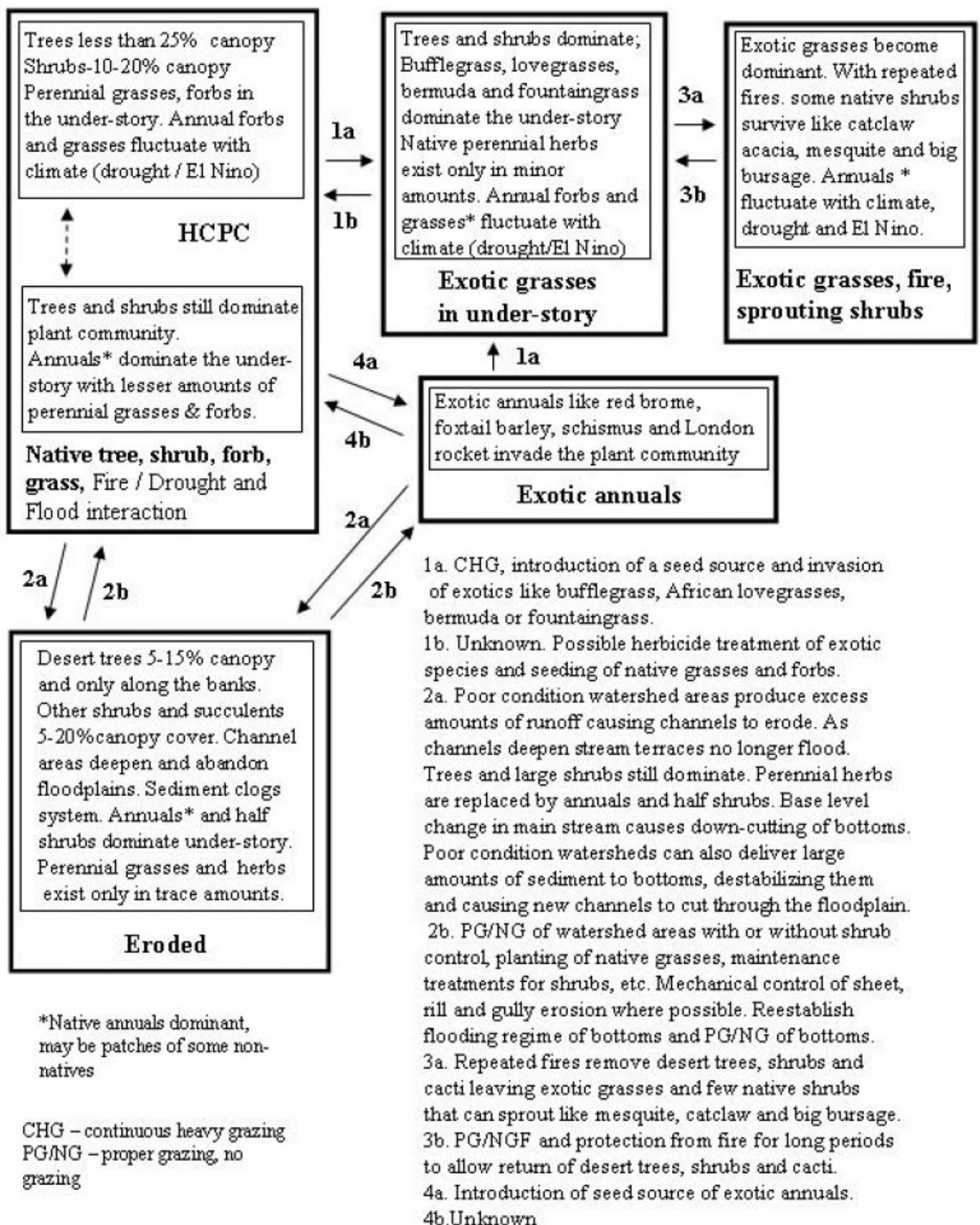


Figure 4. State and Transition, Sandy Wash 10-13" pz.

State 1 Historical Climax Plant Community

Community 1.1

Historical Climax Plant Community

The potential plant community is a diverse mixture of desert trees, shrubs, vines, grasses, and forbs. Major species are well dispersed throughout the plant community. The aspect is shrubland. With continuous, heavy grazing, perennial mid grasses and palatable forbs are removed from the plant community. When the grass cover has been depleted, erosion begins and sandy channels form which remove flood water rapidly and tend to dry the site. With erosion, trees like mesquite, blue paloverde, and retama increase to dominate the site. As palatable understory species are removed, increases occur in shrubs like big bursage, burrowbush, creosotebush, and wolfberry. Base level changes in watersheds can lead to eventual gullyng of this site. Under deteriorated conditions, channel areas develop and are pioneered by shrubs like burrobush and big bursage.

Table 5. Annual production by plant type

Plant Type	Low (Lb/Acre)	Representative Value (Lb/Acre)	High (Lb/Acre)
Grass/Grasslike	175	600	1000
Forb	30	450	800
Tree	250	500	700
Shrub/Vine	62	250	410
Total	517	1800	2910

Table 6. Soil surface cover

Tree basal cover	1-2%
Shrub/vine/liana basal cover	1-2%
Grass/grasslike basal cover	3-8%
Forb basal cover	1-2%
Non-vascular plants	0%
Biological crusts	0-10%
Litter	40-80%
Surface fragments >0.25" and <=3"	5-65%
Surface fragments >3"	0-15%
Bedrock	0-5%
Water	0%
Bare ground	10-50%

Table 7. Canopy structure (% cover)

Height Above Ground (Ft)	Tree	Shrub/Vine	Grass/ Grasslike	Forb
<0.5	—	—	1-5%	0-5%
>0.5 <= 1	—	0-1%	5-15%	1-10%
>1 <= 2	—	0-2%	10-25%	1-15%
>2 <= 4.5	—	1-5%	0-5%	0-5%
>4.5 <= 13	1-10%	1-5%	—	—
>13 <= 40	10-15%	—	—	—
>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
Exotic grasses in under-story

Community 2.1
Exotic grasses in under-story

This state occurs where exotic perennial grasses like buffleggrass, fountain grass, bermuda grass, Lehmann and Boers lovegrasses invade and become dominant in the understory. They replace native grass, perennial forb and vine species. They do not out-compete native trees and shrubs in the deep sandy textured soils of this site.

State 3
Exotic grasses and fire

Community 3.1
Exotic grasses and fire

This state occurs where exotic perennial grasses have invaded the under-story and fire has burned through the plant community. Fire sensitive species like cacti and paloverde are removed from the plant community and sprouting species like mesquite and catclaw acacia recover with exotic grasses dominating the under-story.

State 4
Exotic annuals

Community 4.1
Exotic annuals

This state occurs where exotic annual grasses and forbs have invaded the under-story. These species include red brome, schismus, foxtail barley, London rocket and filaree. These species compete with native annual forbs and grasses. They do not affect the over-story of native trees and shrubs.

State 5
Eroded

Community 5.1
Eroded

This state occurs where poor condition watershed areas contribute excess amounts of runoff to the site and in some cases excess sediment. Sediment can clog channels and extra water can cause channels to deepen and streambanks to erode. Continuous grazing of this site leads to loss of herbaceous species in the under-story and makes the site more susceptible to channel and bank erosion. In some areas base level changes in major stream systems will affect tributary washes by causing channel deepening, increase erosion and reduce the size of the flooded area.

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 grasses			150–250	
	bush muhly	MUPO2	<i>Muhlenbergia porteri</i>	50–200	–
	Arizona cottontop	DICA8	<i>Digitaria californica</i>	5–150	–
	tanglehead	HECO10	<i>Heteropogon contortus</i>	0–100	–
	sideoats grama	BOCU	<i>Bouteloua curtipendula</i>	5–100	–
	spike dropseed	SPCO4	<i>Sporobolus contractus</i>	1–100	–
	plains bristlegrass	SEVU2	<i>Setaria vulpiseta</i>	1–50	–
	giant dropseed	SPGI	<i>Sporobolus giganteus</i>	0–3	–
2	Perennial threeawns			10–150	
	Santa Rita threeawn	ARCAG	<i>Aristida californica</i> var. <i>glabrata</i>	1–50	–
	purple threeawn	ARPU9	<i>Aristida purpurea</i>	0–50	–
	Parish's threeawn	ARPUP5	<i>Aristida purpurea</i> var. <i>parishii</i>	0–50	–
	spidergrass	ARTE3	<i>Aristida ternipes</i>	5–50	–
	spidergrass	ARTEG	<i>Aristida ternipes</i> var. <i>gentilis</i>	1–50	–
	blue threeawn	ARPUN	<i>Aristida purpurea</i> var. <i>nealleyi</i>	0–15	–
3	Misc perennial grasses			5–100	
	whiplash pappusgrass	PAVA2	<i>Pappophorum vaginatum</i>	0–50	–
	big galleta	PLRI3	<i>Pleuraphis rigida</i>	0–50	–
	big sacaton	SPWR2	<i>Sporobolus wrightii</i>	0–20	–
	false Rhodes grass	TRCR9	<i>Trichloris crinita</i>	0–20	–
	cane bluestem	BOBA3	<i>Bothriochloa barbinodis</i>	0–15	–
	black grama	BOER4	<i>Bouteloua eriopoda</i>	0–10	–
	low woollygrass	DAPU7	<i>Dasyochloa pulchella</i>	0–10	–
	desert needlegrass	ACSP12	<i>Achnatherum speciosum</i>	0–10	–
	slim tridens	TRMU	<i>Tridens muticus</i>	0–10	–
	sand dropseed	SPCR	<i>Sporobolus cryptandrus</i>	0–10	–
	squirreltail	ELELE	<i>Elymus elymoides</i> ssp. <i>elymoides</i>	0–5	–
	slender grama	BORE2	<i>Bouteloua repens</i>	0–5	–
	green sprangletop	LEDU	<i>Leptochloa dubia</i>	0–2	–
	large-spike bristlegrass	SEMA5	<i>Setaria macrostachya</i>	0–2	–
	spidergrass	ARTE3	<i>Aristida ternipes</i>	0–2	–
4	Annual grasses			10–500	
	prairie threeawn	AROL	<i>Aristida oligantha</i>	2–100	–
	canyon cupgrass	ERLE7	<i>Eriochloa lemmonii</i>	1–100	–
	mucronate sprangletop	LEPAB	<i>Leptochloa panicea</i> ssp. <i>brachiata</i>	0–100	–
	Mexican panicgrass	PAHI5	<i>Panicum hirticaule</i>	0–50	–
	sixweeks fescue	VUOC	<i>Vulpia octoflora</i>	0–50	–
	Rothrock's grama	BORO2	<i>Bouteloua rothrockii</i>	0–50	–
	feather fingergrass	CHVI4	<i>Chloris virgata</i>	0–50	–
	needle grama	BOAR	<i>Bouteloua aristidoides</i>	0–50	–
	sixweeks grama	BOBA2	<i>Bouteloua barbata</i>	0–25	–
	bearded cupgrass	ERAR5	<i>Eriochloa aristata</i>	0–25	–
	tufted lovegrass	ERPEP2	<i>Eragrostis pectinacea</i> var. <i>pectinacea</i>	0–25	–
	Arizona signalgrass	URAR	<i>Urochloa arizonica</i>	0–25	–

	Parry's grama	BOPA2	<i>Bouteloua parryi</i>	0–20	–
	sixweeks threeawn	ARAD	<i>Aristida adscensionis</i>	0–10	–
	Mexican sprangletop	LEFUU	<i>Leptochloa fusca</i> ssp. <i>uninervia</i>	0–10	–
	Arizona brome	BRAR4	<i>Bromus arizonicus</i>	0–10	–
	witchgrass	PACA6	<i>Panicum capillare</i>	5–10	–
	delicate muhly	MUFR	<i>Muhlenbergia fragilis</i>	0–5	–
	littleseed muhly	MUMI	<i>Muhlenbergia microsperma</i>	0–5	–
	Bigelow's bluegrass	POBI	<i>Poa bigelovii</i>	0–5	–
	Madagascar dropseed	SPPY2	<i>Sporobolus pyramidatus</i>	0–5	–
	desert lovegrass	ERPEM	<i>Eragrostis pectinacea</i> var. <i>miserrima</i>	0–5	–
	Eastwood fescue	VUMIC	<i>Vulpia microstachys</i> var. <i>ciliata</i>	0–2	–
Forb					
5	Parasitic plants			10–50	
	mesquite mistletoe	PHCA8	<i>Phoradendron californicum</i>	10–50	–
	bigseed alfalfa dodder	CUIN	<i>Cuscuta indecora</i>	0–25	–
	manyflower broomrape	ORLUM	<i>Orobanche ludoviciana</i> ssp. <i>multiflora</i>	0–5	–
6	Perennial vines			5–100	
	slender janusia	JAGR	<i>Janusia gracilis</i>	0–25	–
	coyote gourd	CUPA	<i>Cucurbita palmata</i>	1–20	–
	climbing wartclub	BOSC	<i>Boerhavia scandens</i>	1–20	–
	fingerleaf gourd	CUDI	<i>Cucurbita digitata</i>	0–20	–
	fringed twinevine	FUCYC	<i>Funastrum cynanchoides</i> ssp. <i>cynanchoides</i>	0–15	–
	Coulter's lyrepod	LYCO4	<i>Lyrocarpa coulteri</i>	0–10	–
	roving sailor	MAAN9	<i>Maurandella antirrhiniflora</i>	0–10	–
	Gila manroot	MAGI	<i>Marah gilensis</i>	0–5	–
	spearleaf	MAPA9	<i>Matelea parvifolia</i>	0–5	–
	wishbone-bush	MILAV	<i>Mirabilis laevis</i> var. <i>villosa</i>	0–5	–
	Schott's yellowhood	NISC	<i>Nissolia schottii</i>	0–5	–
	desert rosemallow	HICO	<i>Hibiscus coulteri</i>	0–5	–
	Missouri gourd	CUFO	<i>Cucurbita foetidissima</i>	0–5	–
	climbing arrowheads	SIGR	<i>Sicyosperma gracile</i>	0–1	–
7	Perennial forbs			5–50	
	desert globemallow	SPAM2	<i>Sphaeralcea ambigua</i>	5–50	–
	canaigre dock	RUHY	<i>Rumex hymenosepalus</i>	1–20	–
	slender janusia	JAGR	<i>Janusia gracilis</i>	0–20	–
	Arizona foldwing	DIRE4	<i>Dicliptera resupinata</i>	0–10	–
	smooth threadleaf ragwort	SEFLM	<i>Senecio flaccidus</i> var. <i>monoensis</i>	1–10	–
	desert tobacco	NIOBO	<i>Nicotiana obtusifolia</i> var. <i>obtusifolia</i>	1–10	–
	trailing windmills	ALIN	<i>Allionia incarnata</i>	0–10	–
	weakleaf bur ragweed	AMCO3	<i>Ambrosia confertiflora</i>	1–5	–
	dwarf desertpeony	ACNA2	<i>Acourtia nana</i>	0–5	–
	desert marigold	BAMU	<i>Baileya multiradiata</i>	0–5	–
	scarlet spiderling	BOCO	<i>Boerhavia coccinea</i>	0–5	–

	red-gland spurge	CHME5	<i>Chamaesyce melanadenia</i>	0–5	–
	pricklyburr	DAIN2	<i>Datura inoxia</i>	0–5	–
	brownplume wirelettuce	STPA4	<i>Stephanomeria pauciflora</i>	0–5	–
	spreading fleabane	ERDI4	<i>Erigeron divergens</i>	0–5	–
	lacy tansyaster	MAPIP4	<i>Machaeranthera pinnatifida</i> ssp. <i>pinnatifida</i> var. <i>pinnatifida</i>	0–5	–
	caliche globemallow	SPLA	<i>Sphaeralcea laxa</i>	0–2	–
	Parry's beardtongue	PEPA24	<i>Penstemon parryi</i>	0–2	–
	spreading fanpetals	SIAB	<i>Sida abutifolia</i>	0–2	–
	hairy fourwort	TENE	<i>Tetramerium nervosum</i>	0–2	–
	Arizona wrightwort	CAAR7	<i>Carlowrightia arizonica</i>	0–2	–
	brownfoot	ACWR5	<i>Acourtia wrightii</i>	0–2	–
	San Felipe dogweed	ADPO	<i>Adenophyllum porophylloides</i>	0–2	–
	Palmer's Indian mallow	ABPA	<i>Abutilon palmeri</i>	0–2	–
	narrowleaf silverbush	ARLA12	<i>Argythamnia lanceolata</i>	0–1	–
	New Mexico silverbush	ARNE2	<i>Argythamnia neomexicana</i>	0–1	–
	Braun's rockcress	ARPE3	<i>Arabis perstellata</i>	0–1	–
	pineneedle milkweed	ASLI6	<i>Asclepias linaria</i>	0–1	–
	desert larkspur	DEPA	<i>Delphinium parishii</i>	0–1	–
	tall mountain larkspur	DESC	<i>Delphinium scaposum</i>	0–1	–
	bluedicks	DICA14	<i>Dichelostemma capitatum</i>	0–1	–
	hairy five eyes	CHSO	<i>Chamaesaracha sordida</i>	0–1	–
	Texas bindweed	COEQ	<i>Convolvulus equitans</i>	0–1	–
	leatherweed	CRPOP	<i>Croton pottsii</i> var. <i>pottsii</i>	0–1	–
	desert thorn-apple	DADI2	<i>Datura discolor</i>	0–1	–
	catnip noseburn	TRNE	<i>Tragia nepetifolia</i>	0–1	–
	Tumamoc globeberry	TUMA	<i>Tumamoca macdougalii</i>	0–1	–
	orange fameflower	PHAU13	<i>Phemeranthus aurantiacus</i>	0–1	–
	jewels of Opar	TAPA2	<i>Talinum paniculatum</i>	0–1	–
	Coulter's wrinklefruit	TECO	<i>Tetraclea coulteri</i>	0–1	–
	monkeyflower	MIMUL	<i>Mimulus</i>	0–1	–
	Parry's false prairie- clover	MAPA7	<i>Marina parryi</i>	0–1	–
	desert trumpet	ERIN4	<i>Eriogonum inflatum</i>	0–1	–
	California fagonbush	FALA	<i>Fagonia laevis</i>	0–1	–
8	Annual forbs			10–600	
	carelessweed	AMPA	<i>Amaranthus palmeri</i>	1–100	–
	bristly fiddleneck	AMTE3	<i>Amsinckia tessellata</i>	10–100	–
	fringed amaranth	AMFI	<i>Amaranthus fimbriatus</i>	0–50	–
	thelypody	THELY	<i>Thelypodium</i>	0–50	–
	western tansymustard	DEPI	<i>Descurainia pinnata</i>	0–50	–
	shaggyfruit pepperweed	LELA	<i>Lepidium lasiocarpum</i>	0–40	–
	combseed	PECTO	<i>Pectocarya</i>	0–40	–

	sorrel buckwheat	ERPO4	<i>Eriogonum polycladon</i>	0–25	–
	pitseed goosefoot	CHBE4	<i>Chenopodium berlandieri</i>	0–25	–
	wheelscale saltbush	ATEL	<i>Atriplex elegans</i>	0–25	–
	Coulter's spiderling	BOCO2	<i>Boerhavia coulteri</i>	0–20	–
	cryptantha	CRYPT	<i>Cryptantha</i>	0–20	–
	ivyleaf morning-glory	IPHE	<i>Ipomoea hederacea</i>	0–20	–
	manybristle chinchweed	PEPA2	<i>Pectis papposa</i>	0–20	–
	cleftleaf wildheliotrope	PHCR	<i>Phacelia crenulata</i>	0–20	–
	slender goldenweed	MAGR10	<i>Machaeranthera gracilis</i>	0–20	–
	whitestem blazingstar	MEAL6	<i>Mentzelia albicaulis</i>	0–20	–
	woolly tidestromia	TILA2	<i>Tidestromia lanuginosa</i>	0–20	–
	woolly plantain	PLPA2	<i>Plantago patagonica</i>	0–15	–
	tripleleaf morning-glory	IPTE5	<i>Ipomoea ternifolia</i>	0–15	–
	California poppy	ESCAM	<i>Eschscholzia californica</i> ssp. <i>mexicana</i>	0–15	–
	Esteve's pincushion	CHST	<i>Chaenactis stevioides</i>	0–15	–
	yellow tackstem	CAPA7	<i>Calycoseris parryi</i>	0–15	–
	white tackstem	CAWR	<i>Calycoseris wrightii</i>	0–15	–
	smallflowered milkvetch	ASNU4	<i>Astragalus nuttallianus</i>	0–10	–
	fewflower beggarticks	BILE	<i>Bidens leptcephala</i>	0–10	–
	Abert's buckwheat	ERAB2	<i>Eriogonum abertianum</i>	0–10	–
	miniature woollystar	ERDI2	<i>Eriastrum diffusum</i>	0–10	–
	Arizona poppy	KAGR	<i>Kallstroemia grandiflora</i>	0–10	–
	New Mexico plumeseed	RANE	<i>Rafinesquia neomexicana</i>	0–10	–
	sleepy silene	SIAN2	<i>Silene antirrhina</i>	0–10	–
	lyreleaf jewelflower	STCAA	<i>Streptanthus carinatus</i> ssp. <i>arizonicus</i>	0–10	–
	woollyhead neststraw	STMI2	<i>Stylocline micropoides</i>	0–10	–
	desert Indianwheat	PLOV	<i>Plantago ovata</i>	0–10	–
	Lindley's silverpuffs	MILI5	<i>Microseris lindleyi</i>	0–10	–
	glandular threadplant	NEGL	<i>Nemacladus glanduliferus</i>	0–10	–
	Coulter's lupine	LUSP2	<i>Lupinus sparsiflorus</i>	0–10	–
	California desertdandelion	MACA6	<i>Malacothrix californica</i>	0–10	–
	Gordon's bladderpod	LEGO	<i>Lesquerella gordonii</i>	0–5	–
	Arizona lupine	LUAR4	<i>Lupinus arizonicus</i>	0–5	–
	lineleaf whitepuff	OLLI	<i>Oligomeris linifolia</i>	0–5	–
	distant phacelia	PHDI	<i>Phacelia distans</i>	0–5	–
	Arizona phacelia	PHAR13	<i>Phacelia arizonica</i>	0–5	–
	Arizona cottonrose	LOAR12	<i>Logfia arizonica</i>	0–5	–
	crestrib morning-glory	IPCO2	<i>Ipomoea costellata</i>	0–5	–
	redstar	IPCO3	<i>Ipomoea coccinea</i>	0–5	–
	hairy desertsunflower	GECA2	<i>Geraea canescens</i>	0–5	–
	California mustard	GULA4	<i>Guillenia lasiophylla</i>	0–5	–

	Thurber's buckwheat	ERTH3	<i>Eriogonum thurberi</i>	0–5	–
	American wild carrot	DAPU3	<i>Daucus pusillus</i>	0–5	–
	New Mexico thistle	CINE	<i>Cirsium neomexicanum</i>	0–5	–
	hyssopleaf sandmat	CHHY3	<i>Chamaesyce hyssopifolia</i>	0–5	–
	Sonoran sandmat	CHMI7	<i>Chamaesyce micromera</i>	0–5	–
	desert sand verbena	ABVI	<i>Abronia villosa</i>	0–5	–
	hoary bowlesia	BOIN3	<i>Bowlesia incana</i>	0–2	–
	California suncup	CACA32	<i>Camissonia californica</i>	0–2	–
	pincushion flower	CHFR	<i>Chaenactis fremontii</i>	0–2	–
	sand pygmyweed	CRCOC	<i>Crassula connata</i> var. <i>connata</i>	0–2	–
	wedgeleaf draba	DRCU	<i>Draba cuneifolia</i>	0–2	–
	Palmer's grapplinghook	HAPA7	<i>Harpagonella palmeri</i>	0–2	–
	star gilia	GIST	<i>Gilia stellata</i>	0–2	–
	dainty desert hideseed	EUMI2	<i>Eucrypta micrantha</i>	0–2	–
	foothill deervetch	LOHU2	<i>Lotus humistratus</i>	0–2	–
	California goldfields	LACAC2	<i>Lasthenia californica</i> ssp. <i>californica</i>	0–2	–
	flatspine stickseed	LAOCO	<i>Lappula occidentalis</i> var. <i>occidentalis</i>	0–2	–
	slimjim bean	PHFI3	<i>Phaseolus filiformis</i>	0–2	–
	desert evening primrose	OEPR	<i>Oenothera primiveris</i>	0–2	–
	Louisiana vetch	VILU	<i>Vicia ludoviciana</i>	0–2	–
	spectacle fruit	WIRE	<i>Wislizenia refracta</i>	0–2	–
	sand fringe pod	THCU	<i>Thysanocarpus curvipes</i>	0–2	–
	chia	SACO6	<i>Salvia columbariae</i>	0–2	–
	Lemmon's ragwort	SELE8	<i>Senecio lemmonii</i>	0–2	–
	sandyseed clammyweed	PODOT	<i>Polanisia dodecandra</i> ssp. <i>trachysperma</i>	0–2	–
	doubleclaw	PRPA2	<i>Proboscidea parviflora</i>	0–1	–
	London rocket	SIIR	<i>Sisymbrium irio</i>	0–1	–
	bristly scaleseed	SPEC2	<i>Spermolepis echinata</i>	0–1	–
	false carrot	YAMI	<i>Yabea microcarpa</i>	0–1	–
	pellitory	PARIE	<i>Parietaria</i>	0–1	–
	mesa tansyaster	MATA	<i>Machaeranthera tagetina</i>	0–1	–
	tanseyleaf tansyaster	MATA2	<i>Machaeranthera tanacetifolia</i>	0–1	–
	spring pygmycudweed	EVVE	<i>Evax verna</i>	0–1	–
	Mexican fireplant	EUHE4	<i>Euphorbia heterophylla</i>	0–1	–
	Palmer's spectaclepod	DICA31	<i>Dimorphocarpa candicans</i>	0–1	–
	touristplant	DIWI2	<i>Dimorphocarpa wislizeni</i>	0–1	–
	hairy prairie clover	DAMO	<i>Dalea mollis</i>	0–1	–
	shepherd's purse	CABU2	<i>Capsella bursa-pastoris</i>	0–1	–
	ragweed	AMBRO	<i>Ambrosia</i>	0–1	–
	common fiddleneck	AMMEI2	<i>Amsinckia menziesii</i> var. <i>intermedia</i>	0–1	–
	milkweed	ASCLE	<i>Asclepias</i>	0–1	–

Shrub/Vine

9	Half shrubs			5–40	
	singlewhorl burrobrush	HYMO	<i>Hymenoclea monogyra</i>	0–15	–
	white ratany	KRGR	<i>Krameria grayi</i>	0–10	–
	fairyduster	CAER	<i>Calliandra eriophylla</i>	0–10	–
	brittlebush	ENFA	<i>Encelia farinosa</i>	0–5	–
	sweetbush	BEJU	<i>Bebbia juncea</i>	0–5	–
	Coulter's brickellbush	BRCO	<i>Brickellia coulteri</i>	0–5	–
	triangle bur ragweed	AMDE4	<i>Ambrosia deltoidea</i>	0–5	–
	rough menodora	MESC	<i>Menodora scabra</i>	0–5	–
	burroweed	ISTE2	<i>Isocoma tenuisecta</i>	0–5	–
	littleleaf ratany	KRER	<i>Krameria erecta</i>	0–5	–
	broom snakeweed	GUSA2	<i>Gutierrezia sarothrae</i>	0–5	–
	Parish's goldeneye	VIPA14	<i>Viguiera parishii</i>	0–5	–
	desert zinnia	ZIAC	<i>Zinnia acerosa</i>	0–5	–
	toothleaf goldeneye	VIDE3	<i>Viguiera dentata</i>	0–2	–
	whitestem paperflower	PSCO2	<i>Psilostrophe cooperi</i>	0–2	–
	woolly fruit bur ragweed	AMER	<i>Ambrosia eriocentra</i>	0–2	–
	narrowleaf silverbush	ARLA12	<i>Argythamnia lanceolata</i>	0–2	–
	big saltbush	ATLE	<i>Atriplex lentiformis</i>	0–1	–
	rubber rabbitbrush	ERNAG	<i>Ericameria nauseosa</i> ssp. <i>nauseosa</i> var. <i>glabrata</i>	0–1	–
	Douglas' ragwort	SEFLD	<i>Senecio flaccidus</i> var. <i>douglasii</i>	0–1	–
10	Large shrubs			50–300	
	spiny hackberry	CEEH	<i>Celtis ehrenbergiana</i>	10–100	–
	creosote bush	LATR2	<i>Larrea tridentata</i>	0–50	–
	whitethorn acacia	ACCO2	<i>Acacia constricta</i>	2–50	–
	ambrosia leaf bur ragweed	AMAM2	<i>Ambrosia ambrosioides</i>	2–50	–
	soaptree yucca	YUEL	<i>Yucca elata</i>	1–20	–
	Berlandier's wolfberry	LYBE	<i>Lycium berlandieri</i>	2–20	–
	Arizona desert-thorn	LYEX	<i>Lycium exsertum</i>	0–15	–
	Warnock's snakewood	COWA	<i>Condalia warnockii</i>	0–10	–
	burrobrush	HYSA	<i>Hymenoclea salsola</i>	0–10	–
	water jacket	LYAN	<i>Lycium andersonii</i>	0–5	–
	desertbroom	BASA2	<i>Baccharis sarothroides</i>	1–5	–
	lotebush	ZIOB	<i>Ziziphus obtusifolia</i>	1–5	–
	hollyleaf redberry	RHIL	<i>Rhamnus ilicifolia</i>	0–2	–
	mule-fat	BASA4	<i>Baccharis salicifolia</i>	0–2	–
11	Misc shrubs			5–40	
	fourwing saltbush	ATCA2	<i>Atriplex canescens</i>	0–10	–
	Drummond's clematis	CLDR	<i>Clematis drummondii</i>	0–10	–
	longleaf jointfir	EPTR	<i>Ephedra trifurca</i>	0–10	–
	Mexican bladdersage	SAME	<i>Salazaria mexicana</i>	0–10	–
	ironbush	SICH	<i>Simmondsia chinensis</i>	0–10	–

	Eastern Mojave buckwheat	ERFA2	<i>Eriogonum fasciculatum</i>	0–5	–
	desert lavender	HYEM	<i>Hyptis emoryi</i>	0–5	–
	sangre de cristo	JACA2	<i>Jatropha cardiophylla</i>	0–5	–
	Thurber's desert honeysuckle	ANTH2	<i>Anisacanthus thurberi</i>	0–5	–
	Wright's beebrush	ALWR	<i>Aloysia wrightii</i>	0–5	–
	pelotazo	ABIN	<i>Abutilon incanum</i>	0–5	–
	Palmer's bluestar	AMPA5	<i>Amsonia palmeri</i>	0–2	–
	shortleaf baccharis	BABR	<i>Baccharis brachyphylla</i>	0–2	–
	Arizona mimosa	MIDIL	<i>Mimosa distachya</i> var. <i>laxiflora</i>	0–2	–
	Schott's yellowhood	NISC	<i>Nissolia schottii</i>	0–2	–
	Thurber's sandpaper plant	PETH4	<i>Petalonyx thurberi</i>	0–2	–
	American threefold	TRCA8	<i>Trixis californica</i>	0–2	–
	desert zinnia	ZIAC	<i>Zinnia acerosa</i>	0–2	–
	Nevada jointfir	EPNE	<i>Ephedra nevadensis</i>	0–2	–
	fringed twinevine	FUCYC	<i>Funastrum cynanchoides</i> ssp. <i>cynanchoides</i>	0–1	–
	Hartweg's twinevine	FUCYH	<i>Funastrum cynanchoides</i> ssp. <i>heterophyllum</i>	0–1	–
	sorrelvine	CITR2	<i>Cissus trifoliata</i>	0–1	–
	western white clematis	CLLI2	<i>Clematis ligusticifolia</i>	0–1	–
	cattle saltbush	ATPO	<i>Atriplex polycarpa</i>	0–1	–
	prairie acacia	ACANH	<i>Acacia angustissima</i> var. <i>hirta</i>	0–1	–
	burrobush	AMDU2	<i>Ambrosia dumosa</i>	0–1	–
12	Succulents			2–30	
	saguaro	CAGI10	<i>Carnegiea gigantea</i>	0–10	–
	cactus apple	OPEN3	<i>Opuntia engelmannii</i>	1–10	–
	tulip pricklypear	OPPH	<i>Opuntia phaeacantha</i>	0–5	–
	walkingstick cactus	CYSP8	<i>Cylindropuntia spinosior</i>	0–2	–
	candy barrelcactus	FEWI	<i>Ferocactus wislizeni</i>	1–2	–
	Arizona pencil cholla	CYAR14	<i>Cylindropuntia arbuscula</i>	0–2	–
	jumping cholla	CYFU10	<i>Cylindropuntia fulgida</i>	0–1	–
	Christmas cactus	CYLE8	<i>Cylindropuntia leptocaulis</i>	0–1	–
	buck-horn cholla	CYAC8	<i>Cylindropuntia acanthocarpa</i>	0–1	–
	Graham's nipple cactus	MAGR9	<i>Mammillaria grahamii</i>	0–1	–
	staghorn cholla	CYVE3	<i>Cylindropuntia versicolor</i>	0–1	–
	pinkflower hedgehog cactus	ECFA	<i>Echinocereus fasciculatus</i>	0–1	–
	nightblooming cereus	PEGR3	<i>Peniocereus greggii</i>	0–1	–
Tree					
13	Trees			150–700	
	velvet mesquite	PRVE	<i>Prosopis velutina</i>	125–500	–
	catclaw acacia	ACGR	<i>Acacia greggii</i>	25–150	–
	blue paloverde	PAFL6	<i>Parkinsonia florida</i>	10–100	–

	yellow paloverde	PAMI5	<i>Parkinsonia microphylla</i>	0–50	–
	desert ironwood	OLTE	<i>Olneya tesota</i>	0–50	–
	desert willow	CHLI2	<i>Chilopsis linearis</i>	0–15	–
	Jerusalem thorn	PAAC3	<i>Parkinsonia aculeata</i>	0–5	–
	Fremont cottonwood	POFR2	<i>Populus fremontii</i>	0–2	–
	Joshua tree	YUBR	<i>Yucca brevifolia</i>	0–2	–
	netleaf hackberry	CELAR	<i>Celtis laevigata</i> var. <i>reticulata</i>	0–2	–

Animal community

The plant community on this site is suitable for grazing by all classes of livestock. It usually occurs as small inclusions in large areas of upland sites. Having an excellent variety of forage species, long green seasons, shade, and occasional free water, this site will be over used especially in the summer season before proper use is made of adjacent, upland areas. For this reason, grazing systems must be used to allow recovery of herbaceous species on this site. The plant community provides adequate nutrition for livestock throughout the year.

Forage diversity, cover, shade and occasional free water make this site excellent habitat for a great variety of wildlife. It is critical to the large desert mammals inhabiting desert plains. Water developments will lengthen the time of year that free water is available and are very important to wildlife using this site.

Hydrological functions

With deep sandy soils and flat slopes this site is a poor producer of runoff. Depending upon the size of the watershed contributing runoff to the site, it can produce streamflow for short times, in the summer rainy season, to fill ponds.

Recreational uses

Hunting, hiking, camping, photography, horseback riding.

Wood products

Good supplies of mesquite and catclaw acacia for firewood.

Other products

Mesquite beans, cactus fruits and medicinal plants like creosote, coyote tobacco and canaigra.

Inventory data references

Range 417s include 1 in good condition.

Type locality

Location 1: Pima County, AZ	
Township/Range/Section	T16S R7E S3
General legal description	Sells Field Office - Tribal Herd Ranch NE pasture on Santa Rosa Cell SW 1/4 Sec. 3
Location 2: Pima County, AZ	
Township/Range/Section	T17S R9E S25
General legal description	Palo Alto ranch, Soldier well pasture, in NE corner.
Location 3: Pima County, AZ	
Township/Range/Section	T18S R14E S30

General legal description	Santa Rita Experimental Range, Gravelly Ridge Enclosure, Big wash in southern end. Fenced in 1937.
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Contributors

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Rangeland health reference sheet

Interpreting Indicators of Rangeland Health is a qualitative assessment protocol used to determine ecosystem condition based on benchmark characteristics described in the Reference Sheet. A suite of 17 (or more) indicators are typically considered in an assessment. The ecological site(s) representative of an assessment location must be known prior to applying the protocol and must be verified based on soils and climate. Current plant community cannot be used to identify the ecological site.

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

Indicators

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

2. **Presence of water flow patterns:** Highly variable, function of upland overland flow input. Water flow paths are braided channels which change with a frequent flooding regime.

3. **Number and height of erosional pedestals or terracettes:** No accululated or erosional pedestals on most perennial plants. Woody debris dams form around larger shrubs and trees from frequent flooding.

4. **Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):** 15-40%

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):** Highly variable, function of upland

overland flow input.

8. **Soil surface (top few mm) resistance to erosion (stability values are averages - most sites will show a range of values):** Expect ratings of 1-3 across site.
-
9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** Weak platy to granular; color is 7.5-10YR6/4 dry; 7.5-10YR4/4 moist, thickness to 16 inches.
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10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:** Canopy 60-70%; 10-30 perennial grass, 40% shrubs, 10% subshrubs, 10% perennial forbs, and 5-10% trees. Cover is well dispersed throughout site.
-
11. **Presence and thickness of compaction layer (usually none; describe soil profile features which may be mistaken for compaction on this site):** None
-
12. **Functional/Structural Groups (list in order of descending dominance by above-ground annual-production or live foliar cover using symbols: >>, >, = to indicate much greater than, greater than, and equal to):**
- Dominant: Perennial grasses = trees > subshrubs > perennial forbs > succulents (Not: annual forbs and grasses may be greater than subshrubs in El Nino years.)
- Sub-dominant:
- Other:
- Additional:
-
13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):** 20-30% canopy mortality in trees and shrubs; 90-100% mortality of perennial grasses.
-
14. **Average percent litter cover (%) and depth (in):**
-
15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):** 517 lbs/ac unfavorable precipitation, 1800 lbs/ac normal precipitation; 2910 lbs/ac favorable precipitation.
-
16. **Potential invasive (including noxious) species (native and non-native). List species which BOTH characterize degraded states and have the potential to become a dominant or co-dominant species on the ecological site if their future establishment and growth is not actively controlled by management interventions. Species that become dominant for only one to several years (e.g., short-term response to drought or wildfire) are not invasive plants. Note that unlike other indicators, we are describing what is NOT expected in the reference state for the ecological site:** mesquite, blue paloverde, retama, big bursage, burrobrush, buffleggrass, London Rocket, malta

starthistle, desert broom Bermuda grass

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