USDA Natural Resources
Conservation Service

Ecological site R041XB202AZ
Clayey Swale 8-12" p.z.

Last updated: 4/09/2021
Accessed: 05/21/2025

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.

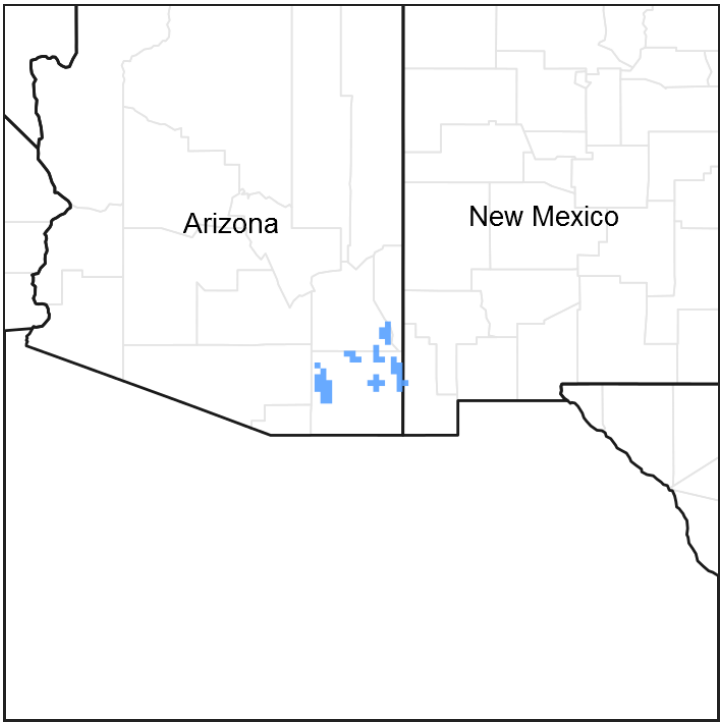


Figure 1. Mapped extent

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): 041X–Madrean Archipelago

AZ 41.2 – Chihuahuan – Sonoran Desert Shrubs

Elevations range from 2600 to 4000 feet and precipitation ranges from 8 to 12 inches per year. Vegetation includes mesquite, palo verde, catclaw acacia, soaptree yucca, creosotebush, whitethorn, staghorn cholla, desert saltbush, Mormon tea, burroweed, snakeweed, tobosa, black grama, threeawns, bush muhly, dropseed, and burrograss. 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

R041XB203AZ	**Clayey Upland 8-12" p.z.**
R041XB204AZ	**Clay Loam Upland 8-12" p.z.**
R041XB223AZ	**Basalt Hills 8-12" p.z.**

Similar sites

R041XC302AZ	**Clayey Swale 12-16" p.z.**
R040XA102AZ	**Clayey Swale 10"-13" p.z.**

Table 1. Dominant plant species

Tree	Not specified
Shrub	Not specified
Herbaceous	(1) *Pleuraphis mutica*

Physiographic features

This site occurs in the lowest elevations of the Madrean Basin and Range province in southeastern Arizona. It occurs on small floodplains, alluvial fans and swales; usually associated with basalt and andesite mountains. The site benefits on an irregular basis from extra water received as runoff from adjacent uplands.

Table 2. Representative physiographic features

Landforms	(1) Flood plain (2) Alluvial fan (3) Swale
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	Rare to occasional
Elevation	2,600–4,000 ft
Slope	0–6%
Aspect	Aspect is not a significant factor

Climatic features

Precipitation ranges from 8-12 inches annually. More than half falls during Jul-Sep in brief, but often heavy, thunderstorms. The rest of the moisture comes as light rain or snow that falls slowly for a day or more, but rarely lasts more than a day. May and June are normally the driest months. Humidity is generally very low.

Temperatures are mild throughout most of the year. Freezing temperatures are common at night Dec-Feb; brief 0 F may be observed some nights. During June, July & August, some days may exceed 100 F.

In years of average or greater winter precipitation, annual grasses and forbs occur abundantly in the interspaces.

Table 3. Representative climatic features

Frost-free period (average)	240 days
Freeze-free period (average)	
Precipitation total (average)	

Influencing water features

There are no water features associated with this site.

Soil features

These soils are deep and clayey textured. They have thin (1-2 inch) surface horizons that range from clayloam to silty clay in texture. They exhibit strong vertic soil properties. Surface soils (10 inches) are usually non-calcareous, but some soils have calcic horizons below the argillic horizon.

Soil series mapped on areas of this site include: SSA-662 Safford area MU Gy Guest; SSA-664 San Simon area MU's 26 Guest & 27 Guest and Hantz; SSA-666 Cochise county Northwestern part MU's 29, 30, 31, 32 Contention; SSA-671 Cochise county Douglas-Tombstone part MU 35 Contention.

Table 4. Representative soil features

Surface texture	(1) Clay (2) Clay loam (3) Silty clay loam
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)	0–2 mmhos/cm
Sodium adsorption ratio (0-40in)	0–2
Soil reaction (1:1 water) (0-40in)	7–8.2
Subsurface fragment volume <=3" (Depth not specified)	0–5%
Subsurface fragment volume >3" (Depth not specified)	0–1%

Ecological dynamics

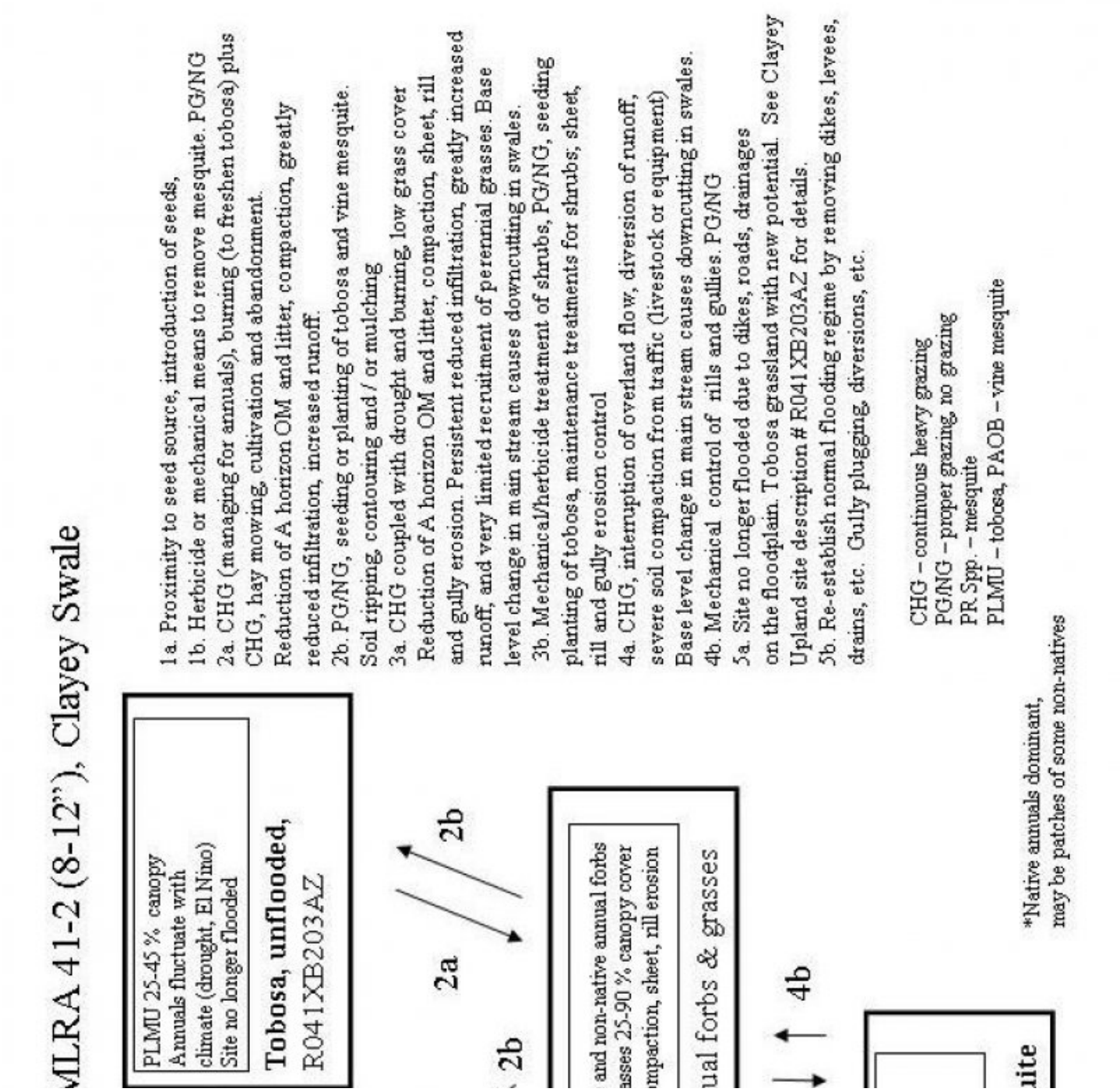
The plant communities found on an ecological site are naturally variable. Composition and production will vary with yearly conditions, location, aspect, and the natural variability of the soils. The historical climax plant community represents the natural potential plant communities found on relict or 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 grazing, fire, 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 shown for the group. Divide the resulting total by the total normal year production shown in the plant community description. If rainfall has been significantly above or below normal, use the total production shown for above or below normal years. If field data is not collected at the end of the summer growing season, then the field data must be corrected to the end of the year production before comparing it to the site description. The growth curve can be used as a guide for estimating production at the end of the summer growing season.

State and transition model



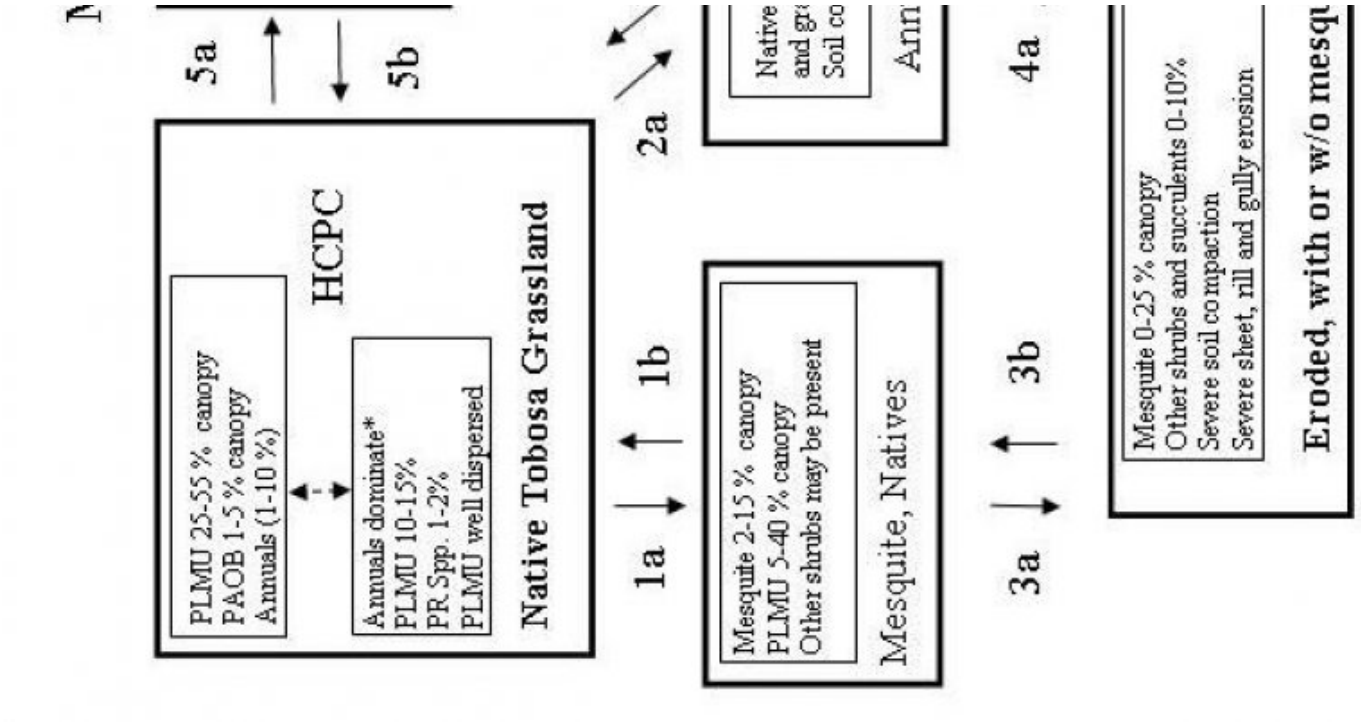


Figure 4. State and Transition, Clayey Swale 8-12" pz.

State 1
Historic Climax Plant Community

Community 1.1
Historic Climax Plant Community

The native potential plant community on this site is grassland with a scattering of desert shrubs and cacti. Annual forbs and grasses, of both winter and summer seasons, are very important in the plant community in their respective (wet) seasons. Tobosa is the dominant perennial grass with lesser amounts of vine mesquite.

Table 5. Annual production by plant type

Plant Type	Low (Lb/Acre)	Representative Value (Lb/Acre)	High (Lb/Acre)
Grass/Grasslike	226	650	935
Forb	5	50	175
Shrub/Vine	0	5	30
Total	**231**	**705**	**1140**

Table 6. Soil surface cover

Tree basal cover	0-1%
Shrub/vine/liana basal cover	0-1%
Grass/grasslike basal cover	5-10%
Forb basal cover	0-1%

Non-vascular plants	0%
Biological crusts	1-10%
Litter	35-65%
Surface fragments >0.25" and <=3"	1-15%
Surface fragments >3"	0-5%
Bedrock	0%
Water	0%
Bare ground	10-60%

Table 7. Canopy structure (% cover)

Height Above Ground (Ft)	Tree	Shrub/Vine	Grass/ Grasslike	Forb
<0.5	–	0-2%	1-15%	1-15%
>0.5 <= 1	–	0-2%	10-35%	1-10%
>1 <= 2	–	0-2%	10-20%	0-5%
>2 <= 4.5	–	0-2%	–	0-1%
>4.5 <= 13	–	0-2%	–	–
>13 <= 40	–	–	–	–
>40 <= 80	–	–	–	–
>80 <= 120	–	–	–	–
>120	–	–	–	–

Figure 6. Plant community growth curve (percent production by month). AZ4121, 41.2 7-12" p.z. all sites. Growth begins in the late winter to early spring, semi-dormancy occurs during the May through June drought, most growth occurs during the summer rainy season..

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	5	5	10	0	0	25	30	15	5	5	0

State 2
Tobosa - unflooded

Community 2.1
Tobosa - unflooded

This plant community occurs where the site is no longer flooded. The reasons can include the interruption of flood flows by roads, diversions and or floodways. The site acts as Clayey Upland #R041BX203AZ.

State 3
Mesquite, tobosa

Community 3.1
Mesquite, tobosa

This community occurs where mesquite has invaded and increased to dominate the plant community. Tree canopy ranges from 2 to 20%. Mesquite is well established and sprouts readily after fire to quickly assume dominance. Tobosa cover remains intact and production remains high.

State 4
Annual forbs and grasses

Community 4.1
Annual forbs and grasses

This community occurs where the tobosa grass cover has been depleted to less than 5% canopy, and is not uniformly dispersed. Causes include the interactions of drought, fire and continuous grazing. In some cases areas of this state occur where the site was cultivated for irrigation and then abandoned. Native and non-native annual forbs and grasses persist to dominate the community.

State 5
Eroded

Community 5.1
Eroded

This state occurs where the perennial grass cover has been depleted and accelerated erosion has left an imprint of rills and gullies on the site. Flooding is no longer effective as gullies rapidly drain extra water from the site. The plant community is a low production mixture of annuals and shrubs like mesquite and snakeweed. Causes can include the lowering of base levels of larger stream systems causing valley side swales to down-cut. Also in some areas adjacent to the Gila and San Pedro river bottom; these soils have a high percentage of gypsum in the soil profile and erode easily with compaction, trailing and continuous grazing.

Additional community tables

Table 8. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Lb/Acre)	Foliar Cover (%)

Group	Common Name	Symbol	Scientific Name	(Lb./Acre)	(%)
Grass/Grasslike					
1	**Dominant Perennial Grasses**			220–700	
	tobosagrass	PLMU3	*Pleuraphis mutica*	200–600	–
	vine mesquite	PAOB	*Panicum obtusum*	20–100	–
2	**Miscellaneous Perennial Grasses**			1–35	
	sideoats grama	BOCU	*Bouteloua curtipendula*	0–10	–
	blue grama	BOGR2	*Bouteloua gracilis*	0–10	–
	big sacaton	SPWR2	*Sporobolus wrightii*	0–10	–
	burrograss	SCBR2	*Scleropogon brevifolius*	0–5	–
	plains bristlegrass	SEVU2	*Setaria vulpiseta*	0–5	–
	alkali sacaton	SPAI	*Sporobolus airoides*	0–5	–
	black grama	BOER4	*Bouteloua eriopoda*	0–5	–
	curly-mesquite	HIBE	*Hilaria belangeri*	0–5	–
	green sprangletop	LEDU	*Leptochloa dubia*	0–5	–
	creeping muhly	MURE	*Muhlenbergia repens*	0–5	–
	cane bluestem	BOBA3	*Bothriochloa barbinodis*	0–5	–
	spidergrass	ARTE3	*Aristida ternipes*	0–2	–
	poverty threeawn	ARDI5	*Aristida divaricata*	0–2	–
	Fendler threeawn	ARPUL	*Aristida purpurea var. longiseta*	0–2	–
	whiplash pappusgrass	PAVA2	*Pappophorum vaginatum*	0–2	–
	squirreltail	ELEL5	*Elymus elymoides*	0–2	–
	Parish's threeawn	ARPUP5	*Aristida purpurea var. parishii*	0–1	–
	purple threeawn	ARPU9	*Aristida purpurea*	0–1	–
	spidergrass	ARTEG	*Aristida ternipes var. gentilis*	0–1	–
3	**Annual grasses**			5–200	
	mucronate sprangeltop	LEPAB	*Leptochloa panicea ssp. brachiata*	1–100	–
	little barley	HOPU	*Hordeum pusillum*	1–100	–
	Arizona signalgrass	URAR	*Urochloa arizonica*	1–50	–
	Mexican	PAHI5	*Panicum hirticaule*	0–30	–

	panicgrass				
	sixweeks fescue	VUOC	*Vulpia octoflora*	1–25	–
	sticky sprangletop	LEVI5	*Leptochloa viscida*	0–25	–
	sixweeks threeawn	ARAD	*Aristida adscensionis*	1–25	–
	needle grama	BOAR	*Bouteloua aristidoides*	0–20	–
	sixweeks grama	BOBA2	*Bouteloua barbata*	0–20	–
	Rothrock's grama	BORO2	*Bouteloua rothrockii*	0–15	–
	prairie threeawn	AROL	*Aristida oligantha*	1–10	–
	witchgrass	PACA6	*Panicum capillare*	0–10	–
	Bigelow's bluegrass	POBI	*Poa bigelovii*	0–5	–
	Mexican sprangletop	LEFUU	*Leptochloa fusca ssp. uninervia*	0–5	–
	Arizona brome	BRAR4	*Bromus arizonicus*	0–5	–
	feather fingergrass	CHVI4	*Chloris virgata*	0–5	–
	tapertip cupgrass	ERACA	*Eriochloa acuminata var. acuminata*	0–5	–
	desert lovegrass	ERPEM	*Eragrostis pectinacea var. miserrima*	0–5	–
	tufted lovegrass	ERPEP2	*Eragrostis pectinacea var. pectinacea*	0–5	–
	delicate muhly	MUFR	*Muhlenbergia fragilis*	0–2	–
	littleseed muhly	MUMI	*Muhlenbergia microsperma*	0–2	–
Forb					
4	**Perennial Forbs**			5–25	
	dwarf desertpeony	ACNA2	*Acourtia nana*	1–10	–
	bluedicks	DICA14	*Dichelostemma capitatum*	0–5	–
	Indian rushpea	HOGL2	*Hoffmannseggia glauca*	1–5	–
	weakleaf bur ragweed	AMCO3	*Ambrosia confertiflora*	1–5	–
	desert globemallow	SPAM2	*Sphaeralcea ambigua*	1–5	–
	brownplume wirelettuce	STPA4	*Stephanomeria pauciflora*	0–5	–

	slender poreleaf	POGR5	*Porophyllum gracile*	1–5	–
	Coues' cassia	SECO10	*Senna covesii*	0–1	–
	silverleaf nightshade	SOEL	*Solanum elaeagnifolium*	0–1	–
	pricklyleaf dogweed	THAC	*Thymophylla acerosa*	0–1	–
	Rocky Mountain zinnia	ZIGR	*Zinnia grandiflora*	0–1	–
	tuber anemone	ANTU	*Anemone tuberosa*	0–1	–
	narrowleaf silverbush	ARLA12	*Argythamnia lanceolata*	0–1	–
	New Mexico silverbush	ARNE2	*Argythamnia neomexicana*	0–1	–
	perennial rockcress	ARPE2	*Arabis perennans*	0–1	–
	dense ayenia	AYMI	*Ayenia microphylla*	0–1	–
	hairyseed bahia	BAAB	*Bahia absinthifolia*	0–1	–
	desert marigold	BAMU	*Baileya multiradiata*	0–1	–
	scarlet spiderling	BOCO	*Boerhavia coccinea*	0–1	–
	desert mariposa lily	CAKE	*Calochortus kennedyi*	0–1	–
	sego lily	CANU3	*Calochortus nuttallii*	0–1	–
	whitemargin sandmat	CHAL11	*Chamaesyce albomarginata*	0–1	–
	whitemouth dayflower	COER	*Commelina erecta*	0–1	–
	leatherweed	CRPO5	*Croton pottsii*	0–1	–
	fingerleaf gourd	CUDI	*Cucurbita digitata*	0–1	–
	Missouri gourd	CUFO	*Cucurbita foetidissima*	0–1	–
	coyote gourd	CUPA	*Cucurbita palmata*	0–1	–
	ragged nettlespurge	JAMA	*Jatropha macrorhiza*	0–1	–
	San Pedro daisy	LAPO4	*Lasianthaea podocephala*	0–1	–
	Parry's false prairie-clover	MAPA7	*Marina parryi*	0–1	–
	lacy tansyaster	MAPIP4	*Machaeranthera pinnatifida ssp. pinnatifida var. pinnatifida*	0–1	–
	plains blackfoot	MELE2	*Melampodium leucanthum*	0–1	–

	wishbone-bush	MILAV	*Mirabilis laevis var. villosa*	0–1	–
	desert tobacco	NIOB	*Nicotiana obtusifolia*	0–1	–
	spreading fleabane	ERDI4	*Erigeron divergens*	0–1	–
	desert trumpet	ERIN4	*Eriogonum inflatum*	0–1	–
	southwestern mock vervain	GLGO	*Glandularia gooddingii*	0–1	–
	brownfoot	ACWR5	*Acourtia wrightii*	0–1	–
	poreleaf dogweed	ADPO2	*Adenophyllum porophyllum*	0–1	–
	trailing windmills	ALIN	*Allionia incarnata*	0–1	–
	largeflower onion	ALMA4	*Allium macropetalum*	0–1	–
5	**Annual forbs**			0–150	
	California poppy	ESCAM	*Eschscholzia californica ssp. mexicana*	0–25	–
	western tansymustard	DEPI	*Descurainia pinnata*	0–20	–
	combseed	PECTO	*Pectocarya*	0–20	–
	Arizona popcornflower	PLAR	*Plagiobothrys arizonicus*	0–20	–
	desert Indianwheat	PLOV	*Plantago ovata*	0–20	–
	shaggyfruit pepperweed	LELA	*Lepidium lasiocarpum*	0–15	–
	intermediate pepperweed	LEVIM	*Lepidium virginicum var. medium*	0–15	–
	coastal bird's-foot trefoil	LOSAB	*Lotus salsuginosus var. brevivexillus*	0–15	–
	tanseyleaf tansyaster	MATA2	*Machaeranthera tanacetifolia*	0–15	–
	bristly fiddleneck	AMTE3	*Amsinckia tessellata*	0–15	–
	miniature woollystar	ERDI2	*Eriastrum diffusum*	0–10	–
	Coulter's lupine	LUSP2	*Lupinus sparsiflorus*	0–10	–
	Arizona poppy	KAGR	*Kallstroemia grandiflora*	0–10	–
	manybristle chinchweed	PEPA2	*Pectis papposa*	0–10	–
	New Mexico	RANE	*Rafinesquia neomexicana*	0–5	–

	New Mexico plumeseed	RANE	*Ratibida neomexicana*	0–5	–
	slender goldenweed	MAGR10	*Machaeranthera gracilis*	0–5	–
	Gordon's bladderpod	LEGO	*Lesquerella gordonii*	0–5	–
	longleaf false goldeneye	HELOA2	*Heliomeris longifolia var. annua*	0–5	–
	camphorweed	HESU3	*Heterotheca subaxillaris*	0–5	–
	foothill deervetch	LOHU2	*Lotus humistratus*	0–5	–
	Nuttall's povertyweed	MONU	*Monolepis nuttalliana*	0–5	–
	sorrel buckwheat	ERPO4	*Eriogonum polycladon*	0–5	–
	Texas stork's bill	ERTE13	*Erodium texanum*	0–5	–
	wedgeleaf draba	DRCU	*Draba cuneifolia*	0–5	–
	flatcrown buckwheat	ERDE6	*Eriogonum deflexum*	0–5	–
	cryptantha	CRYPT	*Cryptantha*	0–5	–
	pitseed goosefoot	CHBE4	*Chenopodium berlandieri*	0–5	–
	milkvetch	ASTRA	*Astragalus*	0–5	–
	wheelscale saltbush	ATEL	*Atriplex elegans*	0–5	–
	Coulter's spiderling	BOCO2	*Boerhavia coulteri*	0–5	–
	carelessweed	AMPA	*Amaranthus palmeri*	0–5	–
	white tackstem	CAWR	*Calycoseris wrightii*	0–2	–
	fringed redmaids	CACI2	*Calandrinia ciliata*	0–2	–
	brittle spineflower	CHBR	*Chorizanthe brevicornu*	0–2	–
	hyssopleaf sandmat	CHHY3	*Chamaesyce hyssopifolia*	0–2	–
	Esteve's pincushion	CHST	*Chaenactis stevioides*	0–2	–
	hairy prairie clover	DAMO	*Dalea mollis*	0–2	–
	American wild	DAPU3	*Daucus pusillus*	0–2	–

	carrot				
	hairy desertsunflower	GECA2	*Geraea canescens*	0–2	–
	star gilia	GIST	*Gilia stellata*	0–2	–
	green carpetweed	MOVE	*Mollugo verticillata*	0–2	–
	Arizona lupine	LUAR4	*Lupinus arizonicus*	0–2	–
	woolly tidestromia	TILA2	*Tidestromia lanuginosa*	0–2	–
	woollyhead neststraw	STMI2	*Stylocline micropoides*	0–2	–
	sleepy silene	SIAN2	*Silene antirrhina*	0–2	–
	phacelia	PHACE	*Phacelia*	0–2	–
	desert evening primrose	OEPR	*Oenothera primiveris*	0–2	–
	Florida pellitory	PAFL3	*Parietaria floridana*	0–2	–
	chia	SACO6	*Salvia columbariae*	0–1	–
	sawtooth sage	SASU7	*Salvia subincisa*	0–1	–
	spreading fanpetals	SIAB	*Sida abutifolia*	0–1	–
	Coulter's globemallow	SPCO2	*Sphaeralcea coulteri*	0–1	–
	doubleclaw	PRPA2	*Proboscidea parviflora*	0–1	–
	sand fringepod	THCU	*Thysanocarpus curvipes*	0–1	–
	tumblemustard	THELY3	*Thelypodiopsis*	0–1	–
	crestrib morning-glory	IPCO2	*Ipomoea costellata*	0–1	–
	bristly nama	NAHI	*Nama hispidum*	0–1	–
	glandular threadplant	NEGL	*Nemacladus glanduliferus*	0–1	–
	Fendler's desertdandelion	MAFE	*Malacothrix fendleri*	0–1	–
	whitestem blazingstar	MEAL6	*Mentzelia albicaulis*	0–1	–
	Mexican fireplant	EUHE4	*Euphorbia heterophylla*	0–1	–
	common woolly sunflower	ERLA6	*Eriophyllum lanatum*	0–1	–
	scrambled eggs	COAU2	*Corydalis aurea*	0–1	–

	Canadian horseweed	COCA5	*Conyza canadensis*	0–1	–
	exserted Indian paintbrush	CAEXE	*Castilleja exserta ssp. exserta*	0–1	–
	yellow tackstem	CAPA7	*Calycoseris parryi*	0–1	–
	hoary bowlesia	BOIN3	*Bowlesia incana*	0–1	–
	southwestern pricklypoppy	ARPL3	*Argemone pleiacantha*	0–1	–
	annual agoseris	AGHE2	*Agoseris heterophylla*	0–1	–
Shrub/Vine					
6	**Miscellaneous Shrubs**			0–10	
	fourwing saltbush	ATCA2	*Atriplex canescens*	0–5	–
	western honey mesquite	PRGLT	*Prosopis glandulosa var. torreyana*	0–5	–
	lotebush	ZIOB	*Ziziphus obtusifolia*	0–1	–
	spiny hackberry	CEEH	*Celtis ehrenbergiana*	0–1	–
	longleaf jointfir	EPTR	*Ephedra trifurca*	0–1	–
	American tarwort	FLCE	*Flourensia cernua*	0–1	–
	creosote bush	LATR2	*Larrea tridentata*	0–1	–
	water jacket	LYAN	*Lycium andersonii*	0–1	–
	pale desert-thorn	LYPA	*Lycium pallidum*	0–1	–
	catclaw mimosa	MIACB	*Mimosa aculeaticarpa var. biuncifera*	0–1	–
	whitethorn acacia	ACCO2	*Acacia constricta*	0–1	–
	catclaw acacia	ACGR	*Acacia greggii*	0–1	–
7	**Half shrubs**			0–10	
	bastardsage	ERWR	*Eriogonum wrightii*	0–5	–
	fairyduster	CAER	*Calliandra eriophylla*	0–2	–
	broom snakeweed	GUSA2	*Gutierrezia sarothrae*	0–2	–
	burroweed	ISTE2	*Isocoma tenuisecta*	0–1	–
	littleleaf ratany	KRER	*Krameria erecta*	0–1	–
	winterfat	KRLA2	*Krascheninnikovia lanata*	0–1	–
	rough menodora	MESC	*Menodora scabra*	0–1	–

	turpentine bush	ERLA12	*Ericameria laricifolia*	0–1	–
	threadleaf snakeweed	GUMI	*Gutierrezia microcephala*	0–1	–
9	**Succulents**			0–10	
	tulip pricklypear	OPPH	*Opuntia phaeacantha*	0–5	–
	banana yucca	YUBA	*Yucca baccata*	0–2	–
	soaptree yucca	YUEL	*Yucca elata*	0–2	–
	dollarjoint pricklypear	OPCH	*Opuntia chlorotica*	0–2	–
	cactus apple	OPEN3	*Opuntia engelmannii*	0–2	–
	Christmas cactus	CYLE8	*Cylindropuntia leptocaulis*	0–2	–
	walkingstick cactus	CYSP8	*Cylindropuntia spinosior*	0–2	–
	candy barrelcactus	FEWI	*Ferocactus wislizeni*	0–1	–
	devil's cholla	GRKU	*Grusonia kunzei*	0–1	–
	buck-horn cholla	CYAC8	*Cylindropuntia acanthocarpa*	0–1	–

Animal community

This site produces considerable perennial forage for livestock. Tobosa is very poor quality forage when cured and only fair forage when green. In wet (El Nino) winters the site produces a tremendous amount of annual forbs and grasses, all of which are excellent forage. The site is home to a variety of small mammals and grassland bird species and their associated predators. It is mainly a foraging area for larger mammals like mule deer and javalina.

Hydrological functions

These soils are heavy textured and good producers of runoff.

Recreational uses

Hunting, horseback riding, hiking, wildlife observation, photography, rock hounding and bird watching.

Wood products

None unless the site has been invaded by mesquite.

Other products

Red clay for pot making. Herbs like grass nuts, wild onions and hog potatos.

Type locality

Location 1: Cochise County, AZ	
Township/Range/Section	T17S R21E S19
General legal description	Kartchner Ranch, Lonesome Valley, St. David area.

Contributors

Dan Robinett
Larry D. Ellicott

Approval

Curtis Talbot, 4/09/2021

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)	Wilma Renken, Dan Robinett, Larry Humphrey, Gwen Dominguez, Clay Stewart
Contact for lead author	Tucson MLRA Soil Survey Office
Date	08/07/2013
Approved by	Curtis Talbot
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 paths occupy less than 5% of the surface area. Sheet flow dominates as a process on this site. Sheet flow lengths are 20-40 feet.

3. **Number and height of erosional pedestals or terracettes:** Pedestals are common on tobosa and about 1 inch high. Terracettes (1-2’ diam x 0.5” ht) are not common on the site making up less than 5% of the area.

4. **Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):** Bare ground is approximately 35-40%. Bare areas, 2’-8’ in diameter, occasionally connected, are common. Bare areas are often masked by annuals and perennial herbaceous overstory.

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):** Fine litter size classes are moving a 2-3 feet in sheet flow areas. Coarse litter staying in place.

8. **Soil surface (top few mm) resistance to erosion (stability values are averages - most sites will show a range of values):** Values of 2-3 in bare areas and 4-6 within vegetated patches.

9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** A horizon is a silty clayloam, 0-3 inches thick with weak platy to weak, fine and medium subangular blocky structure. Colors are 10 YR 6/4 dry and 10 YR 4/3 moist.

10. **Effect of community phase composition (relative proportion of different functional**

groups) and spatial distribution on infiltration and runoff: Aspect is grassland. Perennial grasses (tobosa, burrograss and vine mesquite) dominate the site. Hydrology functions as sheet flow run-off supplementing soil moisture to perennial grass patches. Bare areas contribute to sheet flow and make up approximately 38% of area; vegetated areas are dense and occupy the remaining 62% of the area.

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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):** None present, average depth of penetration from an ARS field penetrometer with a 2.2 kg. sliding hammer, set at 20 inches fall height, is 5 cm. The dense (massive structure) silty clay C2 horizon at 3 inches can feel like a compacted layer.

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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: perennial grasses >

    Sub-dominant: annual grasses >> annual forbs > perennial forbs > large shrubs > sub-shrubs > succulents

    Other: large shrubs, sub-shrubs and succulents absent or in minor amounts

    Additional:

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13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):** Mortality estimated at about 10% on perennial grasses, as expected for this site.

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14. **Average percent litter cover (%) and depth (in):** From the ESD, litter cover can be from 35-60% on this site.

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15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):** 231 lbs/ac. in a below average year; 705 lbs/ac. in an average year; 1140 lbs/ac. in an above average year. Production of summer annual grasses

can exceed expected on years with above average seasonal 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:** mesquite, wolfberry, creosotebush, tumbleweed are present and can increase on the site but occur in trace amounts at present

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17. **Perennial plant reproductive capability:** Not impaired.
