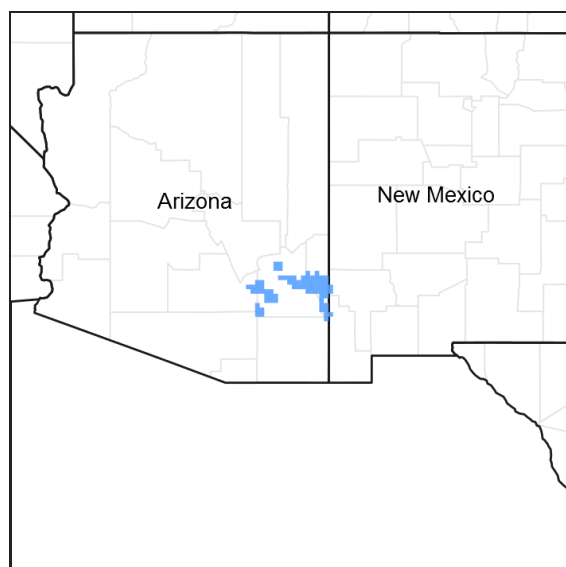


## **Ecological site R041XC303AZ Clayey Slopes 12-16" p.z.**

Last updated: 8/06/2020  
 Accessed: 05/19/2024

### **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 41.3 – Chihuahuan – Sonoran Semidesert Grasslands

Elevations range from 3200 to 5000 feet and precipitation ranges from 12 to 16 inches per year. Vegetation includes mesquite, catclaw acacia, netleaf hackberry, palo verde, false mesquite, range ratany, fourwing saltbush, tarbush, littleleaf sumac, sideoats grama, black grama, plains lovegrass, cane beardgrass, tobosa, vine mesquite, threeawns, Arizona cottontop and bush muhly. The soil temperature regime is thermic and the soil moisture regime is ustic 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**

R041XC304AZ	<b>Clayey Upland 12-16" p.z.</b>
R041XC305AZ	<b>Clay Loam Upland 12-16" p.z.</b>
R041XC312AZ	<b>Loamy Bottom 12-16" p.z.</b>

R041XC313AZ	Loamy Upland 12"-16" p.z.
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## Similar sites

R041XB216AZ	Clayey Slopes 8-12" p.z.
R041XA118AZ	Clayey Slopes 16"-20" p.z.
R040XA103AZ	Clayey Slopes 10"-13" p.z.

**Table 1. Dominant plant species**

Tree	Not specified
Shrub	Not specified
Herbaceous	(1) <i>bouteloua curtipendula</i> (2) <i>pleuraphis mutica</i>

## Physiographic features

This site occurs in the middle elevations of the Madrean Basin and Range province in Southeastern Arizona. It occurs on hill-slopes and ridge-tops. Slope aspect is site differentiating at elevations near land resource area boundaries.

**Table 2. Representative physiographic features**

Landforms	(1) Hill (2) Ridge (3) Scarp slope
Flooding frequency	None
Ponding frequency	None
Elevation	1,006–1,524 m
Slope	15–45%
Aspect	N, E, S

## Climatic features

Precipitation in this common resource area ranges from 12-16 inches yearly in the eastern part with elevations from 3600-5000 feet, and 13-17 inches in the western part where elevations are 3300-4500 feet. Winter-Summer rainfall ratios are 40-60% in the west and 30-70% in the east. Summer rains fall July-September, originate in the Gulf of Mexico and are convective, usually brief, intense thunderstorms. Cool season moisture tends to be frontal, originate in the Pacific and Gulf of California, and falls in widespread storms with long duration and low intensity. Snow rarely lasts more than one day. May and June are the driest months of the year. Humidity is generally very low.

Temperatures are mild. Freezing temperatures are common at night from December-April; however temperatures during the day are frequently above 50 F. Occasionally in December-February, brief 0 F temperatures may be experienced some nights. During June, July and August, some days may exceed 100 F.

Cool season plants start growth in early spring and mature in early summer. Warm season plants take advantage of summer rains and are growing and nutritious July-September. Warm season grasses may remain green throughout the year.

**Table 3. Representative climatic features**

Frost-free period (average)	220 days
Freeze-free period (average)	
Precipitation total (average)	406 mm

## Influencing water features

There are no water features associated with this site.

## Soil features

These are moderately deep to deep soils formed on old lakebed sediments or dissected alluvium of mixed origin. They are non-calcareous in the surface 10 inches. They may have calcic horizons at moderate depths. They have thin (1-2 inch) loamy textured surfaces over clayey subsoil. Surfaces can have well-developed covers of gravels and/or cobbles. Soil surfaces are dark colored. Plant-soil moisture relationships are fair to good.

Soils mapped on this site include: SSA-661 Eastern Pinal & southern Gila counties MU 38 Sontag; SSA-663 Gila-Duncan area MU's 23 Limpia & 38 Signal.

**Table 4. Representative soil features**

Surface texture	(1) Very gravelly loam (2) Very gravelly clay loam (3) Gravelly clay
Family particle size	(1) Clayey
Drainage class	Well drained
Permeability class	Slow
Soil depth	152 cm
Surface fragment cover <=3"	10–45%
Surface fragment cover >3"	0–8%
Available water capacity (0-101.6cm)	10.67–15.24 cm
Calcium carbonate equivalent (0-101.6cm)	10–25%
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)	6.6–8.4
Subsurface fragment volume <=3" (Depth not specified)	10–50%
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 each 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

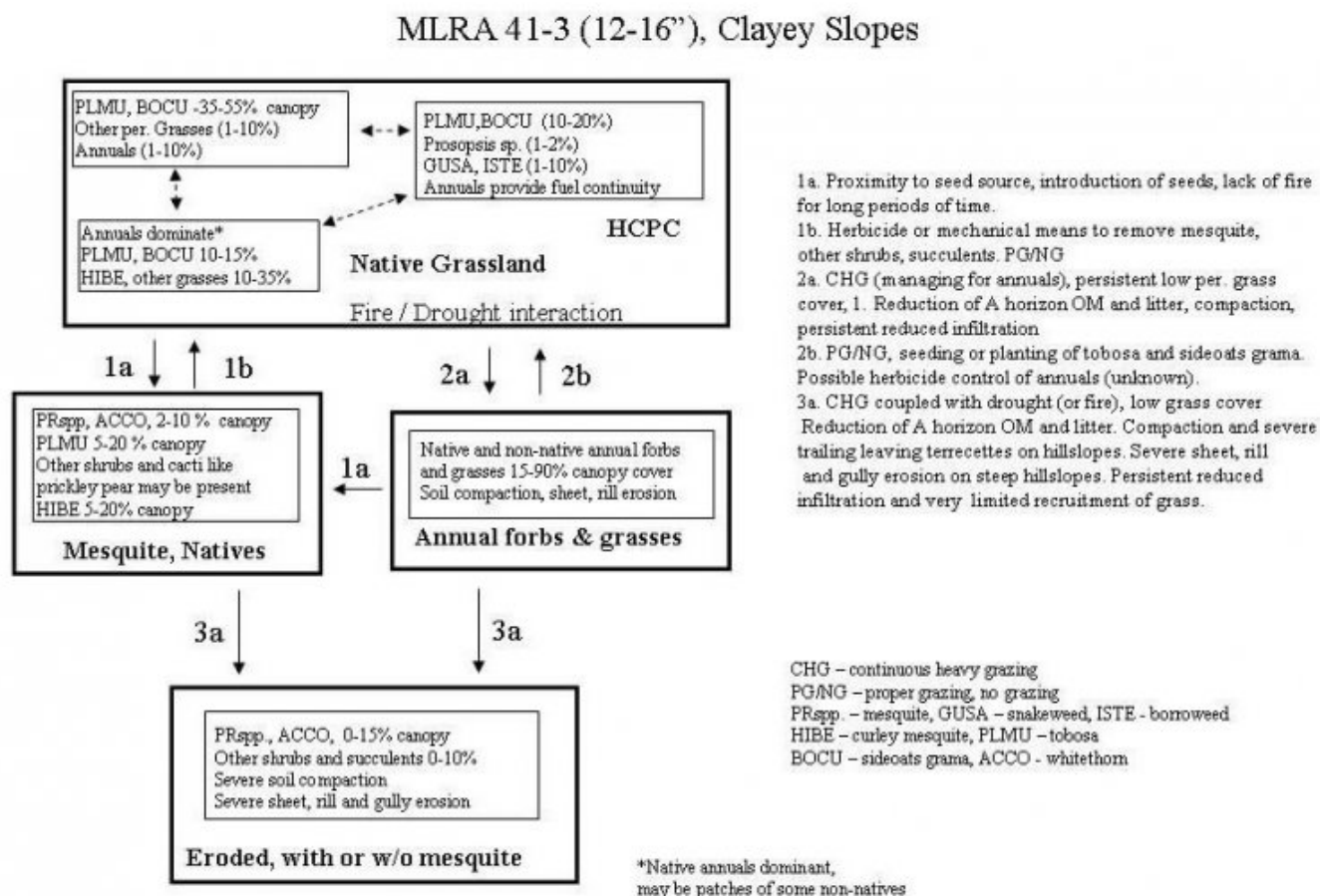


Figure 4. State and Transition, Clayey Slopes 12-16" pz.

## State 1

### Historic Climax Plant Community

#### Community 1.1

#### Historic Climax Plant Community

The historic native state includes the native plant communities that occur on the site, including the historic climax plant community. This state includes other plant communities that naturally occupy the site following fire, drought, flooding, herbivores, and other natural disturbances. The historic climax plant community represents the natural climax community that eventually reoccupies the site with proper management. The potential plant community on this site is dominated by warm season perennial grasses. Shrubs and perennial forbs are well represented on the site. The major perennial grasses, except tobosa and vine mesquite, are well dispersed throughout the plant community. These two species occur in patches of various sizes that may not be well dispersed over larger areas of the site. The aspect is shrub-dotted grassland. With continuous heavy grazing, the more palatable species are taken out of the plant community. Tobosa is left. Species like broom snakeweed, mesquite, and prickly pear and annual forbs and grasses will increase to dominate the plant community. Curly mesquite can increase under

moderate yearlong use and form sod areas of considerable extent. Due to heavy surface textures and steep slopes, this site can become an inefficient user of intense summer rainfall when the perennial grass cover has been greatly reduced. Natural fire may have been important in the development of the potential plant community.

**Table 5. Annual production by plant type**

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Grass/Grasslike	375	785	1065
Forb	22	56	224
Shrub/Vine	45	112	196
<b>Total</b>	<b>442</b>	<b>953</b>	<b>1485</b>

**Table 6. Soil surface cover**

Tree basal cover	0%
Shrub/vine/liana basal cover	0-1%
Grass/grasslike basal cover	6-15%
Forb basal cover	0-1%
Non-vascular plants	0-1%
Biological crusts	0-5%
Litter	20-40%
Surface fragments >0.25" and <=3"	10-45%
Surface fragments >3"	0-8%
Bedrock	0%
Water	0%
Bare ground	20-30%

**Table 7. Canopy structure (% cover)**

Height Above Ground (M)	Tree	Shrub/Vine	Grass/ Grasslike	Forb
<0.15	—	—	1-10%	1-5%
>0.15 <= 0.3	—	1-5%	5-10%	1-20%
>0.3 <= 0.6	—	1-5%	20-40%	0-5%
>0.6 <= 1.4	—	0-2%	0-10%	0-1%
>1.4 <= 4	—	0-1%	—	—
>4 <= 12	—	—	—	—
>12 <= 24	—	—	—	—
>24 <= 37	—	—	—	—
>37	—	—	—	—

**Figure 6. Plant community growth curve (percent production by month). AZ4131, 41.3 12-16" p.z. hill sites. Growth begins in the spring, semi-dormancy occurs during the June drought, most growth occurs during the summer rainy season..**

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

## State 2

## **Mesquite, native grass**

### **Community 2.1**

#### **Mesquite, native grass**



**Figure 7. Clayey Slopes 12-16" pz. mesquite, native grass**

Mesquite invades or increases in the absence of fire for long periods of time. Other shrubs like prickly pear, snakeweed and burroweed can increase. Native perennial grasses still dominate the herbaceous layer; especially tobosa and curly mesquite.

## **State 3**

### **Annual forbs and grasses**

#### **Community 3.1**

##### **Annual forbs and grasses**

The interactions of fire, drought and continuous grazing act to remove perennial grasses from the community. Annuals, both native and non-native dominate the plant community. Some soil compaction has occurred and sheet erosion has accelerated.

## **State 4**

### **Eroded, w/wo mesquite**

#### **Community 4.1**

##### **Eroded, w/wo mesquite**

Severe soil compaction and trailing due to continuous livestock use has resulted in rill and gully erosion on steep slopes; especially where this site has formed on old lakebed sediments. Lakebed alluvium is usually high in gypsum and or salts and very erodible once the surface cover has been removed and compaction and trailing have altered the soil surface hydrology.

## Transition T1A

### State 1 to 2

Proximity to seed source, introduction of seeds, lack of fire for long periods of time.

## Transition T1B

### State 1 to 3

Continuous Heavy Grazing (managing for annuals), persistently low perennial grass cover with reduction of A Horizon, Organic Matter and litter, compaction, persistently reduced infiltration.

## Restoration pathway R2A

### State 2 to 1

Herbicide or mechanical means to remove mesquite, other shrubs, succulents. Prescribed Grazing/No Grazing.

## Transition T2A

### State 2 to 4

Continuous Heavy Grazing coupled with drought (or fire), low grass cover, reduction of A Horizon, Organic Matter and litter. Compaction and severe trailing leaving terracettes on hillslopes. Severe sheet, rill and gully erosion on steep hillslopes. Persistently reduced infiltration and very limited recruitment of grass.

## Restoration pathway R2A

### State 3 to 1

Prescribed Grazing/No Grazing, seeding or planting of tobosa and sideoats grama. Possible herbicide control of annuals (unknown).

## Transition T2B

### State 3 to 2

Proximity to seed source, introduction of seeds, lack of fire for long periods of time.

## Transition T3B

### State 3 to 4

Continuous Heavy Grazing coupled with drought (or fire), low grass cover, reduction of A Horizon, Organic Matter and litter. Compaction and severe trailing leaving terracettes on hillslopes. Severe sheet, rill and gully erosion on steep hillslopes. Persistently reduced infiltration and very limited recruitment of grass.

## 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-grasses</b>			280–504	
	sideoats grama	BOCU	<i>Bouteloua curtipendula</i>	112–280	–
	tobosagrass	PLMU3	<i>Pleuraphis mutica</i>	112–224	–
	vine mesquite	PAOB	<i>Panicum obtusum</i>	28–112	–
	cane bluestem	BOBA3	<i>Bothriochloa barbinodis</i>	28–112	–
2	<b>Dominant short grasses</b>			84–280	
	curly-mesquite	HIBE	<i>Hilaria belangeri</i>	28–112	–

	black grama	BOER4	<i>Bouteloua eriopoda</i>	56–112	–
	blue grama	BOGR2	<i>Bouteloua gracilis</i>	0–56	–
	hairy grama	BOHI2	<i>Bouteloua hirsuta</i>	0–56	–
	Hall's panicgrass	PAHA	<i>Panicum hallii</i>	0–56	–
	purple grama	BORA	<i>Bouteloua radicata</i>	0–28	–
	common wolfstail	LYPH	<i>Lycurus phleoides</i>	0–28	–
	sprucetop grama	BOCH	<i>Bouteloua chondrosioides</i>	0–28	–
3	<b>Perennial threeawns</b>			8–56	
	spidergrass	ARTE3	<i>Aristida ternipes</i>	6–22	–
	spidergrass	ARTEG	<i>Aristida ternipes</i> var. <i>gentilis</i>	1–17	–
	purple threeawn	ARPU9	<i>Aristida purpurea</i>	0–17	–
	Fendler threeawn	ARPUL	<i>Aristida purpurea</i> var. <i>longiseta</i>	1–17	–
	Parish's threeawn	ARPUP5	<i>Aristida purpurea</i> var. <i>parishii</i>	0–11	–
	blue threeawn	ARPUN	<i>Aristida purpurea</i> var. <i>nealleyi</i>	0–6	–
	poverty threeawn	ARDI5	<i>Aristida divaricata</i>	0–6	–
	Havard's threeawn	ARHA3	<i>Aristida havardii</i>	0–6	–
	Wooton's threeawn	ARPA9	<i>Aristida pansa</i>	0–6	–
4	<b>Miscellaneous perennial grasses</b>			0–56	
	plains lovegrass	ERIN	<i>Eragrostis intermedia</i>	0–28	–
	bush muhly	MUPO2	<i>Muhlenbergia porteri</i>	0–28	–
	plains bristlegrass	SEVU2	<i>Setaria vulpiseta</i>	0–28	–
	tanglehead	HECO10	<i>Heteropogon contortus</i>	0–22	–
	green sprangletop	LEDU	<i>Leptochloa dubia</i>	0–22	–
	sand dropseed	SPCR	<i>Sporobolus cryptandrus</i>	0–17	–
	squirreltail	ELEL5	<i>Elymus elymoides</i>	0–17	–
	big sacaton	SPWR2	<i>Sporobolus wrightii</i>	0–11	–
	alkali sacaton	SPAI	<i>Sporobolus airoides</i>	0–11	–
	burrograss	SCBR2	<i>Scleropogon brevifolius</i>	0–11	–
	Rothrock's grama	BORO2	<i>Bouteloua rothrockii</i>	0–11	–
	Arizona cottontop	DICA8	<i>Digitaria californica</i>	0–11	–
	fall witchgrass	DICO6	<i>Digitaria cognata</i>	0–11	–
	low woollygrass	DAPU7	<i>Dasyochloa pulchella</i>	0–6	–
	Arizona muhly	MUAR3	<i>Muhlenbergia arizonica</i>	0–6	–
	slim tridens	TRMU	<i>Tridens muticus</i>	0–6	–
	slender grama	BORE2	<i>Bouteloua repens</i>	0–6	–
5	<b>Annual grasses</b>			6–168	
	Mexican panicgrass	PAHI5	<i>Panicum hirticaule</i>	0–56	–
	Mexican sprangletop	LEFUU	<i>Leptochloa fusca</i> ssp. <i>uninervia</i>	1–56	–
	mucronate sprangletop	LEPAB	<i>Leptochloa panicea</i> ssp. <i>brachiata</i>	1–56	–
	little barley	HOPU	<i>Hordeum pusillum</i>	0–28	–
	prairie threeawn	AROL	<i>Aristida oligantha</i>	1–28	–
	sixweeks fescue	VUOC	<i>Vulpia octoflora</i>	0–28	–
	needle grama	BOAR	<i>Bouteloua aristoides</i>	1–17	–
	feather fingergrass	OLVH4	<i>Chloris virgata</i>	0–17	–



	teatner fingergrass	CHV14	<i>Crionis virgata</i>	0–17	–
	sixweeks threeawn	ARAD	<i>Aristida adscensionis</i>	1–17	–
	desert lovegrass	ERPEM	<i>Eragrostis pectinacea</i> var. <i>miserrima</i>	0–11	–
	tufted lovegrass	ERPEP2	<i>Eragrostis pectinacea</i> var. <i>pectinacea</i>	0–11	–
	sixweeks grama	BOBA2	<i>Bouteloua barbata</i>	0–11	–
	Arizona signalgrass	URAR	<i>Urochloa arizonica</i>	0–11	–
	witchgrass	PACA6	<i>Panicum capillare</i>	0–6	–
	Arizona brome	BRAR4	<i>Bromus arizonicus</i>	0–6	–
	tapertip cupgrass	ERACA	<i>Eriochloa acuminata</i> var. <i>acuminata</i>	0–6	–
	tufted lovegrass	ERPE	<i>Eragrostis pectinacea</i>	0–6	–
	sticky sprangletop	LEVI5	<i>Leptochloa viscida</i>	0–6	–
	delicate muhly	MUFR	<i>Muhlenbergia fragilis</i>	0–1	–
	littleseed muhly	MUMI	<i>Muhlenbergia microsperma</i>	0–1	–
	Bigelow's bluegrass	POBI	<i>Poa bigelovii</i>	0–1	–
<b>Forb</b>					
6	<b>Perennial Forbs</b>			11–56	
	desert globemallow	SPAM2	<i>Sphaeralcea ambigua</i>	1–17	–
	Louisiana vetch	VILUL2	<i>Vicia ludoviciana</i> ssp. <i>ludoviciana</i>	0–17	–
	lacy tansyaster	MAPI	<i>Machaeranthera pinnatifida</i>	0–11	–
	Indian rushpea	HOGL2	<i>Hoffmannseggia glauca</i>	1–11	–
	dwarf desertpeony	ACNA2	<i>Acourtia nana</i>	1–11	–
	wealeaf bur ragweed	AMCO3	<i>Ambrosia confertiflora</i>	1–11	–
	bluedicks	DICA14	<i>Dichelostemma capitatum</i>	1–11	–
	American vetch	VIAM	<i>Vicia americana</i>	0–11	–
	small matweed	GUDED	<i>Guilleminea densa</i> var. <i>densa</i>	0–6	–
	trailing windmills	ALIN	<i>Allionia incarnata</i>	0–6	–
	largeflower onion	ALMA4	<i>Allium macropetalum</i>	0–6	–
	Lewis flax	LILE3	<i>Linum lewisii</i>	0–6	–
	plains blackfoot	MELE2	<i>Melampodium leucanthum</i>	0–6	–
	Wright's cudweed	PSCAC2	<i>Pseudognaphalium canescens</i> ssp. <i>canescens</i>	0–6	–
	tufted evening primrose	OECA10	<i>Oenothera caespitosa</i>	0–2	–
	brownplume wirelettuce	STPA4	<i>Stephanomeria pauciflora</i>	0–2	–
	brownfoot	ACWR5	<i>Acourtia wrightii</i>	0–2	–
	tuber anemone	ANTU	<i>Anemone tuberosa</i>	0–2	–
	white sagebrush	ARLU	<i>Artemisia ludoviciana</i>	0–2	–
	perennial rockcress	ARPE2	<i>Arabis perennans</i>	0–2	–
	dense ayenia	AYMI	<i>Ayenia microphylla</i>	0–2	–
	southwestern mock vervain	GLGO	<i>Glandularia gooddingii</i>	0–2	–
	spreading fleabane	ERDI4	<i>Erigeron divergens</i>	0–2	–
	Cooley's bundleflower	DECO2	<i>Desmanthus cooleyi</i>	0–2	–
	rose heath	CHER2	<i>Chaetopappa ericoides</i>	0–2	–
	whitemouth dayflower	COER	<i>Commelina erecta</i>	0–2	–
	leatherweed	CRPO5	<i>Croton pottsii</i>	0–2	–

	James' prairie clover	DAJA	<i>Dalea jamesii</i>	0–1	–
	desert larkspur	DEPA	<i>Delphinium parishii</i>	0–1	–
	spreading snakeherb	DYSCD	<i>Dyschoriste schiedeana</i> var. <i>decumbens</i>	0–1	–
	wild dwarf morning-glory	EVAR	<i>Evolvulus arizonicus</i>	0–1	–
	Arizona snakecotton	FRAR2	<i>Froelichia arizonica</i>	0–1	–
	beeblossom	GAURA	<i>Gaura</i>	0–1	–
	pearly globe amaranth	GONI	<i>Gomphrena nitida</i>	0–1	–
	Arizona rosemallow	HIBI	<i>Hibiscus biseptus</i>	0–1	–
	desert rosemallow	HICO	<i>Hibiscus coulteri</i>	0–1	–
	hairyseed bahia	BAAB	<i>Bahia absinthifolia</i>	0–1	–
	desert marigold	BAMU	<i>Baileya multiradiata</i>	0–1	–
	lyreleaf greeneyes	BELY	<i>Berlandiera lyrata</i>	0–1	–
	scarlet spiderling	BOCO	<i>Boerhavia coccinea</i>	0–1	–
	Arizona wrightwort	CAAR7	<i>Carlowrightia arizonica</i>	0–1	–
	desert mariposa lily	CAKE	<i>Calochortus kennedyi</i>	0–1	–
	sego lily	CANU3	<i>Calochortus nuttallii</i>	0–1	–
	Indian paintbrush	CAST12	<i>Castilleja</i>	0–1	–
	Watson's dutchman's pipe	ARWA	<i>Aristolochia watsonii</i>	0–1	–
	San Felipe dogweed	ADPO	<i>Adenophyllum porophylloides</i>	0–1	–
	jewels of Opar	TAPA2	<i>Talinum paniculatum</i>	0–1	–
	branched noseburn	TRRA5	<i>Tragia ramosa</i>	0–1	–
	Rocky Mountain zinnia	ZIGR	<i>Zinnia grandiflora</i>	0–1	–
	slimleaf bean	PHAN3	<i>Phaseolus angustissimus</i>	0–1	–
	orange fameflower	PHAU13	<i>Phemeranthus aurantiacus</i>	0–1	–
	ivyleaf groundcherry	PHHE4	<i>Physalis hederifolia</i>	0–1	–
	slender poreleaf	POGR5	<i>Porophyllum gracile</i>	0–1	–
	velvetseed milkwort	POOB	<i>Polygala obscura</i>	0–1	–
	shrubby purslane	POSU3	<i>Portulaca suffrutescens</i>	0–1	–
	Wright's deervetch	LOWR	<i>Lotus wrightii</i>	0–1	–
	variableleaf bushbean	MAGI2	<i>Macroptilium gibbosifolium</i>	0–1	–
	ragged nettlespurge	JAMA	<i>Jatropha macrorhiza</i>	0–1	–
	twingleaf senna	SEBA3	<i>Senna bauhinioides</i>	0–1	–
	New Mexico fanpetals	SINE	<i>Sida neomexicana</i>	0–1	–
	silverleaf nightshade	SOEL	<i>Solanum elaeagnifolium</i>	0–1	–
	wishbone-bush	MILAV	<i>Mirabilis laevis</i> var. <i>villosa</i>	0–1	–
	gooseberryleaf globemallow	SPGR2	<i>Sphaeralcea grossulariifolia</i>	0–1	–
7	<b>Annual Forbs</b>			11–168	
	longleaf false goldeneye	HELOA2	<i>Heliomeris longifolia</i> var. <i>annua</i>	1–28	–
	tanseyleaf tansyaster	MATA2	<i>Machaeranthera tanacetifolia</i>	0–22	–
	carelessweed	AMPA	<i>Amaranthus palmeri</i>	1–22	–

goosefoot	CHENO	<i>Chenopodium</i>	1–22	–
sensitive partridge pea	CHNI2	<i>Chamaecrista nictitans</i>	0–17	–
Coulter's spiderling	BOCO2	<i>Boerhavia coulteri</i>	0–17	–
milkvetch	ASTRA	<i>Astragalus</i>	0–17	–
wheelscale saltbush	ATEL	<i>Atriplex elegans</i>	0–17	–
phacelia	PHACE	<i>Phacelia</i>	0–17	–
intermediate pepperweed	LEVIM	<i>Lepidium virginicum</i> var. <i>medium</i>	0–17	–
coastal bird's-foot trefoil	LOSAB	<i>Lotus salsuginosus</i> var. <i>brevivexillus</i>	0–17	–
Coulter's lupine	LUSP2	<i>Lupinus sparsiflorus</i>	0–17	–
slender goldenweed	MAGR10	<i>Machaeranthera gracilis</i>	0–17	–
western tansymustard	DEPI	<i>Descurainia pinnata</i>	0–17	–
flatcrown buckwheat	ERDE6	<i>Eriogonum deflexum</i>	0–17	–
Arizona popcornflower	PLAR	<i>Plagiobothrys arizonicus</i>	0–17	–
foothill deervetch	LOHU2	<i>Lotus humistratus</i>	0–11	–
woolly tidentromia	TILA2	<i>Tidentromia lanuginosa</i>	0–11	–
California poppy	ESCAM	<i>Eschscholzia californica</i> ssp. <i>mexicana</i>	0–11	–
Arizona poppy	KAGR	<i>Kallstroemia grandiflora</i>	0–11	–
curlytop gumweed	GRNUA	<i>Grindelia nuda</i> var. <i>aphanactis</i>	0–11	–
shaggyfruit pepperweed	LELA	<i>Lepidium lasiocarpum</i>	0–11	–
New Mexico thistle	CINE	<i>Cirsium neomexicanum</i>	0–11	–
cryptantha	CRYPT	<i>Cryptantha</i>	0–6	–
combseed	PECTO	<i>Pectocarya</i>	0–6	–
manybristle chinchweed	PEPA2	<i>Pectis papposa</i>	0–6	–
Nuttall's povertyweed	MONU	<i>Monolepis nuttalliana</i>	0–6	–
sorrel buckwheat	ERPO4	<i>Eriogonum polycladon</i>	0–6	–
camphorweed	HESU3	<i>Heterotheca subaxillaris</i>	0–6	–
crestrib morning-glory	IPCO2	<i>Ipomoea costellata</i>	0–6	–
spurge	EUPHO	<i>Euphorbia</i>	0–6	–
spreading fanpetals	SIAB	<i>Sida abutifolia</i>	0–6	–
desert Indianwheat	PLOV	<i>Plantago ovata</i>	0–6	–
woolly plantain	PLPA2	<i>Plantago patagonica</i>	0–6	–
purslane	PORTU	<i>Portulaca</i>	0–6	–
sawtooth sage	SASU7	<i>Salvia subincisa</i>	0–2	–
New Mexico plumeseed	RANE	<i>Rafinesquia neomexicana</i>	0–2	–
sleepy silene	SIAN2	<i>Silene antirrhina</i>	0–2	–
miniature woollystar	ERDI2	<i>Eriastrum diffusum</i>	0–2	–
warty caltrop	KAPA	<i>Kallstroemia parviflora</i>	0–2	–
green carpetweed	MOVE	<i>Mollugo verticillata</i>	0–2	–
desert evening primrose	OEPR	<i>Oenothera primiveris</i>	0–2	–
phlox	PHLOX	<i>Phlox</i>	0–2	–
Arizona lupine	LUAR4	<i>Lupinus arizonicus</i>	0–2	–
New Mexico copperleaf	ACNE	<i>Acalypha neomexicana</i>	0–2	–

	fewflower beggarticks	BILE	<i>Bidens leptocephala</i>	0–1	–
	southwestern pricklypoppy	ARPL3	<i>Argemone pleiacantha</i>	0–1	–
	American wild carrot	DAPU3	<i>Daucus pusillus</i>	0–1	–
	fringed redmaids	CACI2	<i>Calandrinia ciliata</i>	0–1	–
	miner's lettuce	CLPEP	<i>Claytonia perfoliata</i> ssp. <i>perfoliata</i>	0–1	–
	scrambled eggs	COAU2	<i>Corydalis aurea</i>	0–1	–
	Lemmon's linanthus	LELE29	<i>Leptosiphon lemmonii</i>	0–1	–
	plains flax	LIPU4	<i>Linum puberulum</i>	0–1	–
	Texas stork's bill	ERTE13	<i>Erodium texanum</i>	0–1	–
	wedgeleaf draba	DRCU	<i>Draba cuneifolia</i>	0–1	–
	sanddune wallflower	ERCA14	<i>Erysimum capitatum</i>	0–1	–
	Arizona blanketflower	GAAR2	<i>Gaillardia arizonica</i>	0–1	–
	star gilia	GIST	<i>Gilia stellata</i>	0–1	–
	golden crownbeard	VEEN	<i>Verbesina encelioides</i>	0–1	–
	chia	SACO6	<i>Salvia columbariae</i>	0–1	–
	desert unicorn-plant	PRAL4	<i>Proboscidea althaeifolia</i>	0–1	–
	doubleclaw	PRPA2	<i>Proboscidea parviflora</i>	0–1	–
<b>Shrub/Vine</b>					
8	<b>Dominant half shrubs</b>			28–95	
	fairyduster	CAER	<i>Calliandra eriophylla</i>	6–62	–
	bastardsage	ERWR	<i>Eriogonum wrightii</i>	6–56	–
	winterfat	KRLA2	<i>Krascheninnikovia lanata</i>	0–28	–
	broom snakeweed	GUSA2	<i>Gutierrezia sarothrae</i>	1–17	–
	burroweed	ISTE2	<i>Isocoma tenuisecta</i>	0–6	–
9	<b>Miscellaneous Shrubs</b>			11–56	
	longleaf jointfir	EPTR	<i>Ephedra trifurca</i>	0–11	–
	oneseed juniper	JUMO	<i>Juniperus monosperma</i>	0–6	–
	whitethorn acacia	ACCO2	<i>Acacia constricta</i>	0–6	–
	catclaw acacia	ACGR	<i>Acacia greggii</i>	0–6	–
	fourwing saltbush	ATCA2	<i>Atriplex canescens</i>	0–6	–
	ocotillo	FOSP2	<i>Fouquieria splendens</i>	0–6	–
	pale desert-thorn	LYPA	<i>Lycium pallidum</i>	0–6	–
	catclaw mimosa	MIACB	<i>Mimosa aculeaticarpa</i> var. <i>biuncifera</i>	0–6	–
	velvetpod mimosa	MIDY	<i>Mimosa dysocarpa</i>	0–6	–
	western honey mesquite	PRGLT	<i>Prosopis glandulosa</i> var. <i>torreyana</i>	0–6	–
	velvet mesquite	PRVE	<i>Prosopis velutina</i>	0–6	–
	desert zinnia	ZIAC	<i>Zinnia acerosa</i>	0–6	–
	jojoba	SICH	<i>Simmondsia chinensis</i>	0–6	–
	algerita	MATR3	<i>Mahonia trifoliolata</i>	0–2	–
	yerba de pasmo	BAPT	<i>Baccharis pteronioides</i>	0–2	–
	spiny hackberry	CEEH	<i>Celtis ehrenbergiana</i>	0–2	–
	littleleaf ratany	KRER	<i>Krameria erecta</i>	0–2	–
	trailing krameria	KRLA	<i>Krameria lanceolata</i>	0–2	–

	trailing krameria	KKLA	<i>Krameria lanceolata</i>	0–2	–
	desert-thorn	LYCIU	<i>Lycium</i>	0–2	–
	turpentine bush	ERLA12	<i>Ericameria laricifolia</i>	0–1	–
	threadleaf snakeweed	GUMI	<i>Gutierrezia microcephala</i>	0–1	–
	whitestem paperflower	PSCO2	<i>Psilostrophe cooperi</i>	0–1	–
	yellow trumpetbush	TEST	<i>Tecoma stans</i>	0–1	–
	lotebush	ZIOB	<i>Ziziphus obtusifolia</i>	0–1	–
10	<b>Succulents</b>			6–45	
	cactus apple	OPEN3	<i>Opuntia engelmannii</i>	1–22	–
	banana yucca	YUBA	<i>Yucca baccata</i>	0–11	–
	soaptree yucca	YUEL	<i>Yucca elata</i>	1–11	–
	Christmas cactus	CYLE8	<i>Cylindropuntia leptocaulis</i>	0–6	–
	walkingstick cactus	CYSP8	<i>Cylindropuntia spinosior</i>	0–6	–
	candy barrelcactus	FEWI	<i>Ferocactus wislizeni</i>	1–6	–
	sacahuista	NOMI	<i>Nolina microcarpa</i>	0–6	–
	Palmer's century plant	AGPA3	<i>Agave palmeri</i>	0–6	–
	Arizona pencil cholla	CYAR14	<i>Cylindropuntia arbuscula</i>	0–6	–
	Parry's agave	AGPA4	<i>Agave parryi</i>	0–2	–
	dollarjoint pricklypear	OPCH	<i>Opuntia chlorotica</i>	0–2	–
	staghorn cholla	CYVE3	<i>Cylindropuntia versicolor</i>	0–2	–
	hedghehog cactus	ECHIN3	<i>Echinocereus</i>	0–1	–
	white fishhook cactus	ECIN2	<i>Echinomastus intertextus</i>	0–1	–
	rainbow cactus	ECPEP	<i>Echinocereus pectinatus</i> var. <i>pectinatus</i>	0–1	–
	spiny star	ESVI2	<i>Escobaria vivipara</i>	0–1	–
	Graham's nipple cactus	MAGR9	<i>Mammillaria grahamii</i>	0–1	–
	little nipple cactus	MAHE2	<i>Mammillaria heyderi</i>	0–1	–
	purple pricklypear	OPMAM	<i>Opuntia macrocentra</i> var. <i>macrocentra</i>	0–1	–
	tulip pricklypear	OPPH	<i>Opuntia phaeacantha</i>	0–1	–
	buck-horn cholla	CYAC8	<i>Cylindropuntia acanthocarpa</i>	0–1	–
	jumping cholla	CYFU10	<i>Cylindropuntia fulgida</i>	0–1	–

## Animal community

The plant community on this site is suitable for grazing at any season by all classes of cattle. Steep slopes can hinder utilization. Ridge-tops, canyon bottoms, and adjacent areas of level uplands will be overused before appreciable use is made of this site. Care must be taken to avoid overuse of the palatable perennial grasses in attempts to utilize tobosa grass on the site. Because of these reasons, fencing and grazing systems are needed to adequately manage areas of this site. Herbaceous forage will be deficient in protein in the winter.

Water developments are very important to wildlife on this site. Even though the site is open grassland, it is topographically diverse and home to a variety of large and small wildlife species.

## Hydrological functions

With moderate to steep slopes and clayey soils this site is a producer of runoff.

## Recreational uses

Hunting, hiking, horseback riding, photography, bird-watching.

## Wood products

Mesquite, where it has increased on the site, is shrubby and there may be only enough fuel-wood for campfires and branding fires.

## Other products

Grass nuts, wild onions and hog potatoes

## Inventory data references

Range 417s include 2 in excellent condition, 6 in good condition and 2 in fair condition.

## Type locality

Location 1: Cochise County, AZ	
Township/Range/Section	T21S R20E S7
General legal description	Fort Huachuca, west range
Location 2: Cochise County, AZ	
Township/Range/Section	T11S R26E S33
General legal description	Safford Hwy ROW
Location 3: Santa Cruz County, AZ	
Township/Range/Section	T21S R12E S11
General legal description	Sopori Ranch
Location 4: Graham County, AZ	
Township/Range/Section	T9S R22E S28
General legal description	Just outside of west boundary of Eureka Springs Ranch on south side of Aravaipa road.

## Contributors

Dan Robinett  
Larry D. Ellicott  
Steve Barker  
Unknown

## Approval

Scott Woodall, 8/06/2020

## 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
Contact for lead author	NRCS Tucson Area Office

Date	03/07/2005
Approved by	Scott Woodall
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

## Indicators

1. **Number and extent of rills:** None present on this site.  

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2. **Presence of water flow patterns:** Uncommon, probably cover no more than 10% of area; discontinuous; very short, usually less than 1-3 feet in length.  

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3. **Number and height of erosional pedestals or terracettes:** Pedestals are uncommon on perennial grass and shrubs; Terracettes uncommon.  

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4. **Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):** 0-5%  

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5. **Number of gullies and erosion associated with gullies:** None present on this site.  

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6. **Extent of wind scoured, blowouts and/or depositional areas:** None present on this site.  

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7. **Amount of litter movement (describe size and distance expected to travel):** All litter size classes staying in place.  

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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):** Expect values of 1-3 in canopy interspaces and 4-6 under plant canopies.  

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9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** Weak fine granular; Color is 5YR4/2 Dry, 5YR3/2 Moist; thickness 2 to 8 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 30-40%, Basal 5%, Litter 45-55%; 60-70% of canopy cover is perennial grasses, 5% perennial forbs, 15-25% shrubs & subshrubs. Cover is well dispersed throughout site.  

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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 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: perennial grass

Sub-dominant: subshrubs

Other: annual grasses & forbs

Additional: perennial grass > subshrubs > annual grasses & forbs > shrubs succulents = perennial forbs

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13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):** 50% of basal cover of perennial grasses has likely been lost in recent prolonged drought.
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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):** 500 lbs/acre unfavorable precipitation, 850 lbs/acre normal precipitation, 1,200 lbs/acre favorable precipitation
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16. **Potential invasive (including noxious) species (native and non-native). List species which BOTH characterize degraded states and have the potential to become a dominant or co-dominant species on the ecological site if their future establishment and growth is not actively controlled by management interventions. Species that become dominant for only one to several years (e.g., short-term response to drought or wildfire) are not invasive plants. Note that unlike other indicators, we are describing what is NOT expected in the reference state for the ecological site:** jojoba, whitethorn, mesquite, prickley pear, cane cholla & ocotillo may increase to undesirable levels in the absence of natural fires; Red brome and wild oats.
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17. **Perennial plant reproductive capability:** Not affected even following several years of prolonged drought period for region
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