

Ecological site R041XC304AZ Clayey Upland 12-16" p.z.

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General information

Provisional. A provisional ecological site description has undergone quality control and quality assurance review. It contains a working state and transition model and enough information to identify the ecological site.



Figure 1. Mapped extent

Areas shown in blue indicate the maximum mapped extent of this ecological site. Other ecological sites likely occur within the highlighted areas. It is also possible for this ecological site to occur outside of highlighted areas if detailed soil survey has not been completed or recently updated.

MLRA notes

Major Land Resource Area (MLRA): 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

R041XC301AZ	Basalt Hills 12-16" p.z.
R041XC302AZ	Clayey Swale 12-16" p.z.
R041XC305AZ	Clay Loam Upland 12-16" p.z.

Similar sites

R040XA104AZ	Clayey Upland 10"-13" p.z.
R038XA102AZ	Clayey Upland 12-16" p.z.
R041XB203AZ	Clayey Upland 8-12" p.z.

Table 1. Dominant plant species

Tree	Not specified	
Shrub	Not specified	
Herbaceous	(1) pleuraphis mutica(2) panicum obtusum	

Physiographic features

This site occurs in the middle elevations of the Madrean Basin and Range province in southeastern Arizona. It occurs on pediments, old fan terraces, basalt flows and mesa tops. It is always in an upland position.

Landforms	(1) Fan piedmont (2) Lava flow (3) Plain
Flooding frequency	None
Ponding frequency	None
Elevation	975–1,524 m
Slope	1–15%
Aspect	Aspect is not a significant factor

Table 2. Representative physiographic features

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 that have formed in clayey alluvium of basic igneous origin or from shale parent materials. They are very dark colored and have high shrink-swell potentials. Churning and cracking cause very uneven surfaces and has resulted in most of the gravels and cobbles being pushed to the surface. Plant-soil moisture relationships are good.

Soils mapped on this site include: SSA-661 Eastern Pinal & Southern Gila counties MU 39 Sontag; SSA-663 Gila--Duncan area MU 5 Bonita; SSA-664 San Simon area MU 8 Bonita; SSA-669 Pima county Eastern part MU 31 Graham; SSA-671 Cochise county Douglas-Tombstone part MU's 13 Bonita, 57 & 114 Outlaw, 61 Epitaph CbVCL, 114 Epitaph and Paramore.

Parent material	(1) Alluvium–basalt
Family particle size	(1) Clayey
Drainage class	Well drained
Permeability class	Moderately slow to slow
Soil depth	76–152 cm
Surface fragment cover <=3"	5–20%
Surface fragment cover >3"	0–10%
Available water capacity (0-101.6cm)	9.14–18.29 cm
Calcium carbonate equivalent (0-101.6cm)	1–15%
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)	0–10%
Subsurface fragment volume >3" (Depth not specified)	0–5%

Table 4. Representative soil features

Ecological dynamics

This plant community is tobosa grassland with a canopy cover from 35 to 55%. It has a diverse flora of native annual forbs and grasses and minor amounts of shrubs. Periodic wildfires occurred, June thru August, and controlled shrubs encroaching from adjacent sites, and maintained tobosa in good vigor. When the tobosa canopy is reduced to less than 5% and its cover is patchy in distribution it will not be able to re-colonize large areas. Tobosa is a very poor seed producer, in the wild, and has almost no viable seed in the soil seed-bank. It is not known what influence the presence of non-native annuals has on the diversity of native species. Lehmann lovegrass is not adapted to this site and will not invade. Possible invasive and exotic weeds on this site include; yellow and malta starthistle, Russian and spotted knapweed; these may occur, especially where cultivated areas have been abandoned.

State and transition model

MLRA 41-3 (12-16"), Clayey Upland



State 1 Native Tobosa Grassland

Community 1.1 Historic Climax Plant Community

The potential plant community on this site is dominated by warm season perennial grasses, primarily tobosa and vine mesquite. Vine mesquite occurs in patches which are not evenly dispersed across the site. With continuous grazing, patches develop which are dominated by annual forbs and grasses, with larger patches of almost pure tobosa. Palatable perennial grasses and forbs disappear. Mesquite does not appear to be able to dominate on this site, perhaps due to soil churning and cracking. Natural fire was 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	538	981	1345
Forb	45	112	247
Shrub/Vine	_	28	112
Total	583	1121	1704

Table 6. Soil surface cover

Tree basal cover	0%
Shrub/vine/liana basal cover	0%
Grass/grasslike basal cover	8-15%

Forb basal cover	0-1%
Non-vascular plants	0-1%
Biological crusts	1-5%
Litter	25-55%
Surface fragments >0.25" and <=3"	0-20%
Surface fragments >3"	0-5%
Bedrock	0%
Water	0%
Bare ground	15-25%

Table 7. Canopy structure (% cover)

Height Above Ground (M)	Tree	Shrub/Vine	Grass/ Grasslike	Forb
<0.15	-	-	0-5%	1-5%
>0.15 <= 0.3	-	0-1%	2-15%	1-10%
>0.3 <= 0.6	-	0-1%	35-55%	0-2%
>0.6 <= 1.4	-	0-1%	0-5%	-
>1.4 <= 4	-	-	-	-
>4 <= 12	-	-	-	-
>12 <= 24	-	-	-	-
>24 <= 37	-	-	-	-
>37	_	_	_	_

Figure 5. Plant community growth curve (percent production by month). AZ4134, 41.3 12-16" p.z. other sites. Growth begins in the spring, semidormancy occurs during the May through June drought, most growth occurs during the summer rains..

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	0	5	10	0	0	30	35	15	5	0	0

State 2 Annual forbs and grasses

Community 2.1 Annual forbs and grasses



Figure 6. Clayey Upland 12-16" pz., annuals and shrubs

Tobosa canopy is reduced (less than 5%) due the interactions of drought, heavy grazing and / or fire. Some areas of this state have been created by cultivation for irrigated farming; with subsequent abandonment. Native and nonnative annual species dominate. Tobosa canopy is gone or very low and patchy in distribution. Tobosa will not be able to re-colonize this state due to a lack of seed production and viable seeds in the soil seed-bank. Vertic soil properties maintain good soil tilth and good infiltration rates, when soils are dry. Plant production remains high, even with the lack of perennial grass cover, due to soil churning and cracking and good hydrologic relationships. Some mesquite, prickly pear, and other shrubs or succulents may be present.

State 3 Mesquite, native grasses

Community 3.1 Mesquite, native grasses

Mesquite has invaded and occurs at canopy levels from 2 to 10%. Other shrubs may also occur like whitethorn acacia and prickly pear. Fire has been excluded for long periods of time. Tobosa still dominates the under-story with annual grasses and forbs, both native and non-native. Fires can still burn through this community, but mesquite is well established and will sprout and quickly re-assume dominance.

State 4 Eroded state

Community 4.1 Eroded state

Very heavy traffic by livestock and or machinery has caused persistent compaction. Diversion of overland flow and runoff water in farming areas may also have caused rilling and / or gullies to form. The soil profile no longer gets wet so the inherent, vertic, soil properties cannot act to maintain good soil tilth and good rainfall infiltration. This state usually occurs in cultivated regions where small areas of rangeland are used as feeding areas for livestock and roads and bar-ditches have interrupted normal hydrologic patterns.

Transition T1A State 1 to 2

Continuous heavy grazing (managing for annuals) or cultivation and abandonment

Transition T1B State 1 to 3

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

Restoration pathway R1A State 2 to 1

Brush management, prescribed grazing

Transition T2A State 2 to 4

Continuous heavy grazing, interuption of overland flow, diversion of run-off, mechanical soil compaction (livestock or equipment)

Restoration pathway R3A State 3 to 1

Brush management, prescribed grazing

Transition T3A State 3 to 4

Continuous heavy grazing coupled with drought or fire

Restoration pathway R4A State 4 to 2

mechanical control of rills and gullies, prescribed grazing

Restoration pathway R3B State 4 to 3

brush management, mechanical land treatment, mechanical gully control, range seeding, prescribed grazing

Additional community tables

Table 8. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Kg/Hectare)	Foliar Cover (%)				
Grass	Grass/Grasslike								
1	Dominant mid grasses	6		504–897					
	tobosagrass	PLMU3	Pleuraphis mutica	504–729	-				
	sideoats grama	BOCU	Bouteloua curtipendula	0–90	-				
	vine mesquite	PAOB	Panicum obtusum	22–84	-				
2	Miscellaneous perenn	ial grasses	5	22–78					
	curly-mesquite	HIBE	Hilaria belangeri	0–56	-				
	squirreltail	ELEL5	Elymus elymoides	0–39	-				
	cane bluestem	BOBA3	Bothriochloa barbinodis	0–34	-				
	blue grama	BOGR2	Bouteloua gracilis	0–34	-				
	green sprangletop	LEDU	Leptochloa dubia	0–22	-				
	common wolfstail	LYPH	Lycurus phleoides	0–11	-				
	creeping muhly	MURE	Muhlenbergia repens	0–11	-				
	Hall's panicgrass	PAHA	Panicum hallii	0–11	-				
	burrograss	SCBR2	Scleropogon brevifolius	0–11	-				
	plains bristlegrass	SEVU2	Setaria vulpiseta	0–11	-				
	Rothrock's grama	BORO2	Bouteloua rothrockii	0–11	-				
	Arizona cottontop	DICA8	Digitaria californica	0–11	-				
	black grama	BOER4	Bouteloua eriopoda	0–11	_				
	plains lovegrass	ERIN	Eragrostis intermedia	0–11	_				
3	Perennial threeawns	·		0–56					
	Fendler threeawn	ARPUL	Aristida purpurea var. longiseta	0–22	_				
	spidergrass	ARTE3	Aristida ternipes	0–22	-				
	spidergrass	ARTEG	Aristida ternipes var. gentilis	0–22	-				
	poverty threeawn	ARDI5	Aristida divaricata	0–11	-				
	Havard's threeawn	ARHA3	Aristida havardii	0–11	_				
	Wooton's threeawn	ARPA9	Aristida pansa	0–11					
4	Annual grasses			11–168					

			-	
_	little barley	HOPU	Hordeum pusillum	1–112
	Mexican sprangletop	LEFUU	Leptochloa fusca ssp. uninervia	1–56
	mucronate sprangeltop	LEPAB	Leptochloa panicea ssp. brachiata	1–56
	Arizona signalgrass	URAR	Urochloa arizonica	1–56
	sixweeks fescue	VUOC	Vulpia octoflora	1–56
	sixweeks threeawn	ARAD	Aristida adscensionis	0–56
	prairie threeawn	AROL	Aristida oligantha	0–56
	needle grama	BOAR	Bouteloua aristidoides	1–56
	sixweeks grama	BOBA2	Bouteloua barbata	0–56
	Mexican panicgrass	PAHI5	Panicum hirticaule	1–28
	sticky sprangletop	LEVI5	Leptochloa viscida	0–28
	feather fingergrass	CHVI4	Chloris virgata	0–28
	Arizona brome	BRAR4	Bromus arizonicus	0–22
	tapertip cupgrass	ERACA	Eriochloa acuminata var. acuminata	0–17
	Mexican lovegrass	ERME	Eragrostis mexicana	0–17
	witchgrass	PACA6	Panicum capillare	0–17
	tufted lovegrass	ERPE	Eragrostis pectinacea	0–11
	desert lovegrass	ERPEM	Eragrostis pectinacea var. miserrima	0–11
	delicate muhly	MUFR	Muhlenbergia fragilis	0–6
	littleseed muhly	МОМІ	Muhlenbergia microsperma	0–6
	Bigelow's bluegrass	POBI	Poa bigelovii	0–6
Forb)	<u> </u>	I	I
5	Perennial forbs			22–78
	Lewis flax	LILE3	Linum lewisii	0–28
	Indian rushpea	HOGL2	Hoffmannseggia glauca	6–22
	•		Sphaeralcea ambigua	6_22
	desert globemallow	SPAM2		0-22
	desert globemallow bluedicks	SPAM2 DICA14	Dichelostemma capitatum	1-17
	desert globemallow bluedicks spreading fleabane	SPAM2 DICA14 ERDI4	Dichelostemma capitatum Erigeron divergens	<u> </u>
	desert globemallow bluedicks spreading fleabane Arizona snakecotton	SPAM2 DICA14 ERDI4 FRAR2	Dichelostemma capitatum Erigeron divergens Froelichia arizonica	0-22 1-17 0-17 0-11
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	desert globemallowbluedicksspreading fleabaneArizona snakecottoncoyote gourdpearly globe amaranthweakleaf bur ragweedmilkvetch	SPAM2 DICA14 ERDI4 FRAR2 CUPA GONI AMCO3 ASTRA	Dichelostemma capitatum Erigeron divergens Froelichia arizonica Cucurbita palmata Gomphrena nitida Ambrosia confertiflora Astragalus	0-22 1-17 0-17 0-11 0-11 0-11 1-11 0-11
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	dwarf desertpeony	ACNA2	Acourtia nana	0–6	-
	brownfoot	ACWR5	Acourtia wrightii	0–6	_
	largeflower onion	ALMA4	Allium macropetalum	0–6	-
	scarlet spiderling	BOCO	Boerhavia coccinea	0–6	_
	whitemouth dayflower	COER	Commelina erecta	0–6	_
	southwestern mock vervain	GLGO	Glandularia gooddingii	0–6	-
	small matweed	GUDE	Guilleminea densa	0–2	-
	desert mariposa lily	CAKE	Calochortus kennedyi	0–2	-
	sego lily	CANU3	Calochortus nuttallii	0–2	-
	silverleaf nightshade	SOEL	Solanum elaeagnifolium	0–2	-
	variableleaf bushbean	MAGI2	Macroptilium gibbosifolium	0–2	-
	twinleaf senna	SEBA3	Senna bauhinioides	0–2	_
	shrubby purslane	POSU3	Portulaca suffrutescens	0–2	_
	ragged nettlespurge	JAMA	Jatropha macrorhiza	0–1	-
6	Annual Forbs			22–168	
	longleaf false goldeneye	HELOA2	Heliomeris longifolia var. annua	0–56	_
	carelessweed	AMPA	Amaranthus palmeri	0–34	-
	camphorweed	HESU3	Heterotheca subaxillaris	0–28	_
	tanseyleaf tansyaster	MATA2	Machaeranthera tanacetifolia	0–28	_
	sensitive partridge pea	CHNI2	Chamaecrista nictitans	1–28	_
	Arizona popcornflower	PLAR	Plagiobothrys arizonicus	0–28	_
	western tansymustard	DEPI	Descurainia pinnata	0–22	_
	common sunflower	HEAN3	Helianthus annuus	0–22	-
	Arizona poppy	KAGR	Kallstroemia grandiflora	0–22	-
	intermediate pepperweed	LEVIM	Lepidium virginicum var. medium	0–22	-
	crestrib morning-glory	IPCO2	Ipomoea costellata	0–17	_
	woolly plantain	PLPA2	Plantago patagonica	0–17	_
	spreading fanpetals	SIAB	Sida abutifolia	0–17	_
	slender goldenweed	MAGR10	Machaeranthera gracilis	0–11	_
	shaggyfruit pepperweed	LELA	Lepidium lasiocarpum	0–11	-
	coastal bird's-foot trefoil	LOSAB	Lotus salsuginosus var. brevivexillus	0–11	-
	goosefoot	CHENO	Chenopodium	0–11	_
	miniature woollystar	ERDI2	Eriastrum diffusum	0–11	_
	Coulter's spiderling	BOCO2	Boerhavia coulteri	0–11	_
	New Mexico thistle	CINE	Cirsium neomexicanum	0–11	_
	scrambled eggs	COAU2	Corydalis aurea	0–11	_
	cryptantha	CRYPT	Cryptantha	0–6	_
	fringed redmaids	CACI2	Calandrinia ciliata	0–6	_
	sorrel buckwheat	ERPO4	Eriogonum polycladon	0–6	_
	California poppy	ESCAM	Eschscholzia californica ssp. mexicana	0–6	_
	spurge	EUPHO	Euphorbia	0–6	-

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	blanketflower	GAILL	Gaillardia	0–6	_
	star gilia	GIST	Gilia stellata	0–6	_
	Coulter's lupine	LUSP2	Lupinus sparsiflorus	0–6	_
	hollowleaf annual lupine	LUSU3	Lupinus succulentus	0–6	
	Nuttall's povertyweed	MONU	Monolepis nuttalliana	0–6	_
	green carpetweed	MOVE	Mollugo verticillata	0–6	-
	foothill deervetch	LOHU2	Lotus humistratus	0–6	_
	Goodding's bladderpod	LEGO2	Lesquerella gooddingii	0–6	_
	wheelscale saltbush	ATEL	Atriplex elegans	0–6	_
	sleepy silene	SIAN2	Silene antirrhina	0–6	_
	woolly tidestromia	TILA2	Tidestromia lanuginosa	0–6	-
	purslane	PORTU	Portulaca	0–6	-
	desert Indianwheat	PLOV	Plantago ovata	0–6	_
	sawtooth sage	SASU7	Salvia subincisa	0–6	-
	Texas stork's bill	ERTE13	Erodium texanum	0–3	-
	wedgeleaf draba	DRCU	Draba cuneifolia	0–2	-
	American wild carrot	DAPU3	Daucus pusillus	0–2	_
	sacred thorn-apple	DAWR2	Datura wrightii	0–2	_
	Lemmon's linanthus	LELE29	Leptosiphon lemmonii	0–2	_
	manybristle chinchweed	PEPA2	Pectis papposa	0–2	_
	phlox	PHLOX	Phlox	0–2	_
	Arizona lupine	LUAR4	Lupinus arizonicus	0–2	_
	New Mexico copperleaf	ACNE	Acalypha neomexicana	0–2	-
	ragwort	SENEC	Senecio	0–2	_
	desert unicorn-plant	PRAL4	Proboscidea althaeifolia	0–2	-
	doubleclaw	PRPA2	Proboscidea parviflora	0–2	-
Shrub	Shrub/Vine				
7	Half shrubs			0–56	
	bastardsage	ERWR	Eriogonum wrightii	1–28	_
	broom snakeweed	GUSA2	Gutierrezia sarothrae	0–11	_
	burroweed	ISTE2	Isocoma tenuisecta	0–6	_
	yerba de pasmo	BAPT	Baccharis pteronioides	0–6	_
	threadleaf snakeweed	GUMI	Gutierrezia microcephala	0–2	_
8	Miscellaneous shrubs			0–28	
	catclaw acacia	ACGR	Acacia greggii	0–6	_
	pale desert-thorn	LYPA	Lycium pallidum	0–6	_
	catclaw mimosa	MIACB	Mimosa aculeaticarpa var. biuncifera	0–6	_
	western honey mesquite	PRGLT	Prosopis glandulosa var. torreyana	0–2	_
	velvet mesquite	PRVE	Prosopis velutina	0–2	
	lotebush	ZIOB	Ziziphus obtusifolia	0–2	
	fourwing saltbush	ATCA2	Atriplex canescens	0–2	_
	fainductor	CVED	Calliandra orionhulla	0.2	

	าลแ งนนอเอเ		Gailianura c hophylia	0-2	-
	knifeleaf condalia	COSP3	Condalia spathulata	0–2	-
	Warnock's snakewood	COWA	Condalia warnockii	0–2	-
	trailing krameria	KRLA	Krameria lanceolata	0–2	_
	winterfat	KRLA2	Krascheninnikovia lanata	0–2	-
	whitethorn acacia	ACCO2	Acacia constricta	0–2	_
9	Succulents	•		0–28	
	walkingstick cactus	CYSP8	Cylindropuntia spinosior	0–11	-
	cactus apple	OPEN3	Opuntia engelmannii	0–11	-
	tulip pricklypear	OPPH	Opuntia phaeacantha	0–6	_
	banana yucca	YUBA	Yucca baccata	0–6	-
	Christmas cactus	CYLE8	Cylindropuntia leptocaulis	0–6	-
	dollarjoint pricklypear	OPCH	Opuntia chlorotica	0–6	-
	sacahuista	NOMI	Nolina microcarpa	0–2	-
	soaptree yucca	YUEL	Yucca elata	0–2	-
	Palmer's century plant	AGPA3	Agave palmeri	0–2	-
	rainbow cactus	ECPEP	Echinocereus pectinatus var. pectinatus	0–1	-
	spinystar	ESVI2	Escobaria vivipara	0–1	_
	candy barrelcactus	FEWI	Ferocactus wislizeni	0–1	-

Animal community

The plant community on this site is suitable for grazing at any season by all classes of cattle. Clay soils make for a long summer green season. Dark colored soils, high in organic matter and exchangeable bases make for fairly good quality, green tobosa herbage. Fencing and grazing systems will be needed to effectively utilize this site and take adequate care of adjacent and/or included sites that produce more palatable forage. Herbaceous forage will be deficient in protein in the winter. Dormant tobosa is very unpalatable.

Water developments are very important to wildlife species on this site. Being open grassland, this site is home to a variety of small herbivores, birds, and their associated predators. With the exception of antelope, larger wildlife species use this site mainly as a foraging area.

Hydrological functions

Due to severe soil cracking and churning (producing rough and porous surfaces), this site has very high infiltration rates when soils are dry. It produces runoff only when soils are moist. Vertic soil properties eliminate soil compaction by livestock traffic each year, as long as stocking rates are moderate and heavy stocking is not persistent during times of the year when soils are moist.

Recreational uses

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

Wood products

Mesquite is shrubby if on this site due to clayey soils. Mesquite fuelwood, if present, is barely sufficient for campfires and branding fires.

Other products

Clay

Inventory data references

Range 417s include 4 in good condition and 1 in fair condition.

Type locality

Location 1: Cochise County, AZ				
Township/Range/Section	T23S R30E S1			
General legal description	Peterson Ranch			
Location 2: Graham County, AZ				
Township/Range/Section	T11S R22E S9			
General legal description	Sierra Bonita Ranch			
Location 3: Greenlee County, AZ				
Township/Range/Section	T10S R31E S14			
General legal description	Lazy B Ranch			

Contributors

Dan Robinett Larry D. Ellicott Steve Barker Unknown

Approval

Scott Woodall, 7/21/2020

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	02/24/2005
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.
- 2. **Presence of water flow patterns:** Uncommon; probably cover no more than 2-5% of area; discontinuous, 2-20 feet in length in low gravel cover areas, broken by plants and micro topography from cracking and swelling; High gravel cover areas (50% cover) at this site results in sheet flow of these areas; Gravel cover averaged 9% across site.

- 3. Number and height of erosional pedestals or terracettes: Accumulated pedastals are 1 inch tall and are common on perennial grass plants; terracettes are very uncommon due to low slope.
- 4. Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground): Estimated from 200 points at 60%.
- 5. Number of gullies and erosion associated with gullies: None present on this site.
- 6. Extent of wind scoured, blowouts and/or depositional areas: None present on this site.
- 7. Amount of litter movement (describe size and distance expected to travel): All litter size classes staying in place.
- 8. Soil surface (top few mm) resistance to erosion (stability values are averages most sites will show a range of values): No slake test done; expect values of 1-2 in bare ground areas and 4-6 in canopy areas.
- Soil surface structure and SOM content (include type of structure and A-horizon color and thickness): Thin (1/8 inch) rain drop compacted laminar layer, weak granular; Color is 10YR5/4 Dry, 10YR3/3 Moist; No A horizon, Clayloam texture to 6 inches.
- 10. Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff: Cover estimated from 200 points was: Canopy 14%, Basal 7% Litter 7% and Gravel 9%; 85% of canopy cover is perennial grasses and 14% is subshrubs and 1% shrubs & succulents. Cover is relatively well dispersed thoughout site, with bare patches 10-20 feet wide 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 present on this site. Penetrometer tests with weight dropped 5 times at a distance from top of weight to topo of impact ring = 2.24 feet were: average = 3.26 inches, s.d = 0.46 inches.
- 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 forbs

Additional: Perennial grass >> subshrubs > annual forbs > shrubs > perennial forbs > succulents

- 13. Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence): 20% basal mortality (prior years mortality not well evidenced).
- 14. Average percent litter cover (%) and depth (in):
- 15. Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annualproduction): 600 lbs/acre unfavorable precipitation, 1,000 lbs/acre normal precipitation, 1,500 lbs/acre 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: None present on this site. Shrubs not likely to tolerate shrink/swell soil properties.
- 17. **Perennial plant reproductive capability:** Not affected even following several years of prolonged drought period for region.