USDA Natural Resources Conservation Service

Ecological site R038XB203AZ
Clay Loam Upland 16-20" p.z.

Accessed: 05/12/2025

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.

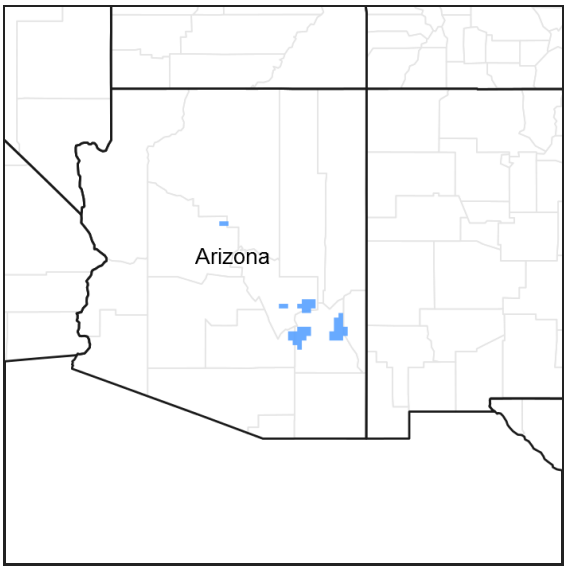

Figure 1. Mapped extent

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): 038X–Mogollon Transition South

AZ 38.2 - Middle Mogollon Transition

Elevations range from 4000 to 5500 feet and precipitation averages 16 to 20 inches per year. Vegetation includes turbinella oak, Wright silktassel, hollyleaf buckthorn, desert buckbrush, one-seed juniper, alligator juniper, pinyon, algerita, sugar sumac, prairie junegrass, blue grama, curly mesquite, bottlebrush squirreltail, muttongrass, cane beardgrass, plains lovegrass and bullgrass. The soil temperature regime ranges from thermic to mesic and the soil moisture regime is aridic ustic. This unit occurs within the Transition Zone Physiographic Province and is characterized by canyons and structural troughs or valleys. Igneous, metamorphic and sedimentary rock classes occur on rough mountainous terrain in association with less extensive sediment filled valleys exhibiting little integrated drainage.

Classification relationships

Similar site to TES (Terrestrial Ecosystem Sites) map unit no's. 463 and 481 on the Prescott National Forest.

Associated sites

R038XB202AZ	**Clayey Upland 16-20" p.z.**
R038XB209AZ	**Loamy Upland 16-20" p.z.**
R038XB215AZ	**Clayey Hills 16-20" p.z.**

Similar sites

R038XA103AZ	**Clay Loam Upland 12-16" p.z.**
R041XA109AZ	**Clay Loam Upland 16-20" p.z.**
R038XA102AZ	**Clayey Upland 12-16" p.z.**

Table 1. Dominant plant species

Tree	Not specified
Shrub	(1) *Eriogonum wrightii*
Herbaceous	(1) *Bouteloua gracilis* (2) *Bouteloua curtipendula*

Physiographic features

This site occurs in the mid to upper elevations of the Mogollon Transition zone south of the Rim in central Arizona. This site is in an upland position. It neither benefits significantly from run-in moisture nor suffers from excess runoff. It occurs on valley slopes, plains and plateaus.

Table 2. Representative physiographic features

Landforms	(1) Fan piedmont (2) Plateau (3) Plain
Flooding frequency	None
Ponding frequency	None
Elevation	1,341–1,707 m
Slope	0–8%
Aspect	Aspect is not a significant factor

Climatic features

Precipitation in this common resource area averages 16 to 20 inches annually. The winter-summer rainfall ratio ranges from about 60/40% in the western part of the area to 45/55% in the eastern part. Summer rains fall July through September; and are from high-intensity convective thunderstorms. This moisture originates primarily from the Gulf of Mexico, but can come from the remnants of Pacific hurricanes in September. Winter moisture is frontal, originates in the north Pacific, and falls as rain or snow in widespread storms of low intensity and long duration. Snowfall ranges from 5 to 35 inches per year and can occur from November through April. Snow seldom persists for more than a week. May and June are the driest months of the year. Humidity is generally low all year. Average annual air temperatures range from 51 to 60 degrees F
(thermic temperature regime). Daytime temps in the summer are commonly in the low 90's. Freezing temperatures are common from October through April. The actual precipitation, avaliable moisture and temperature varies, depending on, region, elevation, rain shadow effect and aspect.

Table 3. Representative climatic features

Frost-free period (average)	180 days
Freeze-free period (average)	240 days
Precipitation total (average)	508 mm

Influencing water features

There are no water features associated with this site.

Soil features

These soils are deep (60 inches), clayey throughout, and well drained. They are formed in alluvium from basalt, andesite and related volcanic tuffs and ash. The surface textures are clayloam and gravelly clayloam. They do not exhibit vertic properties. The effective rooting depth is 40 to 60 inches. Runoff is moderate to high on moist soils. The erosion hazard is slight unless heavy traffic causes trailing and compaction.

Soil series mapped include; SSA639 MU's 411 Cockscomb & 414 Whitehouse GrSL and SSA675 San Carlos IR Area MU 1 Cherrycow.

Table 4. Representative soil features

Parent material	(1) Alluvium–basalt
Surface texture	(1) Clay loam (2) Gravelly clay loam
Family particle size	(1) Clayey
Drainage class	Well drained to moderately well drained
Permeability class	Moderate to slow
Soil depth	152 cm
Surface fragment cover <=3"	5–45%
Surface fragment cover >3"	1–5%
Available water capacity (0-101.6cm)	12.19–23.37 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)	6.6–8.2
Subsurface fragment volume <=3" (Depth not specified)	0–20%
Subsurface fragment volume >3" (Depth not specified)	0–5%

Ecological dynamics

The native plant community is a grama grassland (canopy cover of 40 to 60%) with an important component of cool season grasses that fluctuate with climate. Cool and warm season annual grasses and forbs are well represented in the flora. Half shrubs and perennial forbs are an important group also. Periodic wildfires occured every 10 to 15 years; June through August, and controlled shrubs and succulents invading from adjacent, shallow soil, areas. In the abscence of fire for long periods of time; shrubs, trees and cacti can dominate the site. The interactions of drought, fire and grazing can result in a loss of perennial grass cover. In these situations annuals, both native and non-native, can dominate the plant community. Non-native annuals can, over time, diminish the soil seedbank of native annual species.

State and transition model

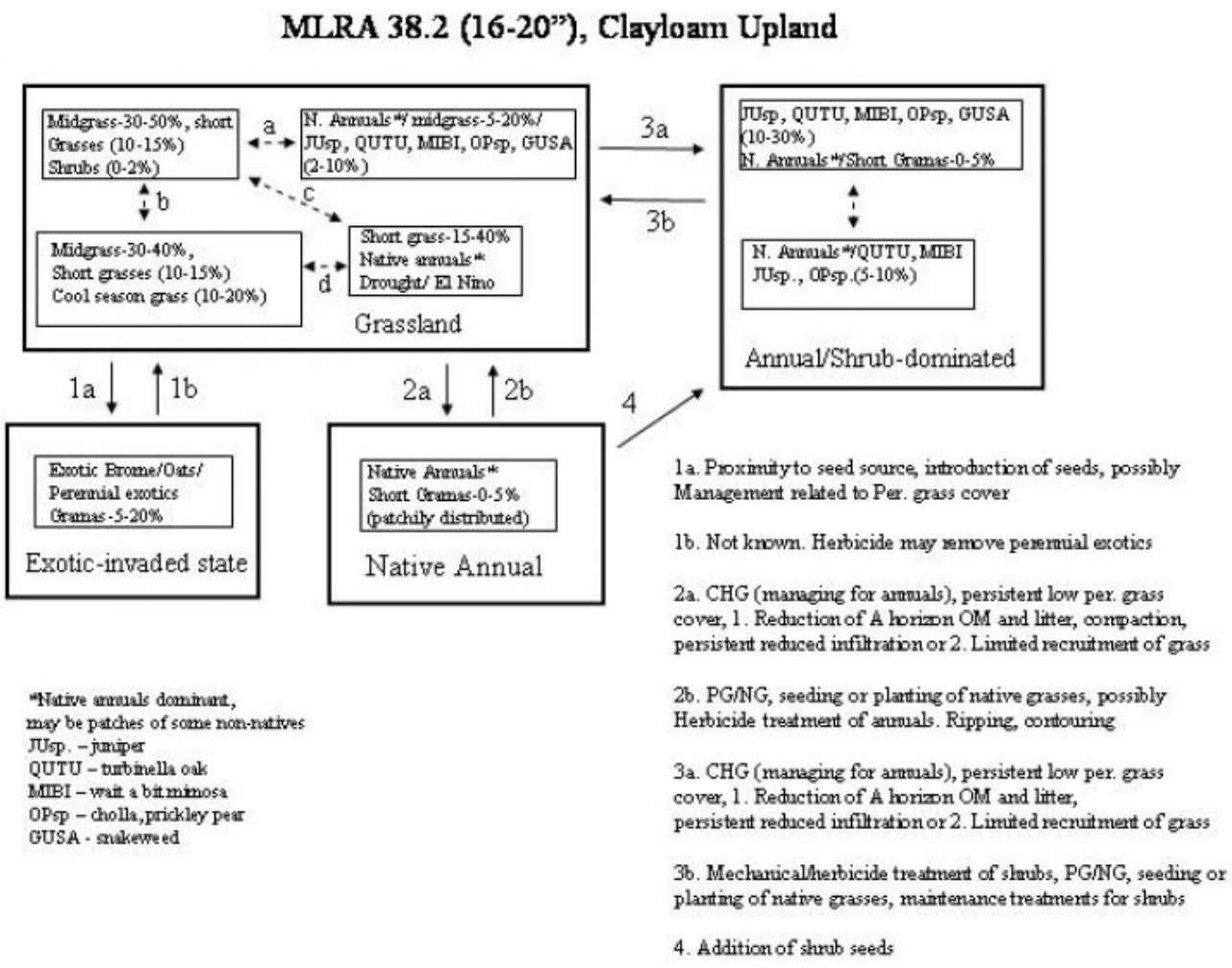

Figure 4. State & Transition Model, Clayloam Upland 16-20"pz

State 1
Mixed Native Grassland State

Community 1.1
Historic Native Plant Community

The historic, native, plant community is a grassland dominated by blue grama, sideoats grama, black grama, tobosa and curley mesquite. Prairie junegrass and bottlebrush squirreltail are an important in the plant community, but can diminish to low levels after severe winter - spring drought. Shrubby buckwheat is an important half-shrub in the plant community. A rich flora of native annual forbs and grasses, of both the winter and summer seasons, exist in the plant community. Periodic, naturally occuring, wildfires were important in maintaining 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	594	1401	1821
Forb	22	168	448
Shrub/Vine	56	112	168
Tree	–	–	28
Total	**672**	**1681**	**2465**

Table 6. Ground cover

Tree foliar cover	0%
Shrub/vine/liana foliar cover	0-5%
Grass/grasslike foliar cover	10-18%
Forb foliar cover	0-1%
Non-vascular plants	0-1%
Biological crusts	0-5%
Litter	20-60%
Surface fragments >0.25" and <=3"	5-45%
Surface fragments >3"	0-5%
Bedrock	0%
Water	0%
Bare ground	15-35%

Table 7. Canopy structure (% cover)

Height Above Ground (M)	Tree	Shrub/Vine	Grass/ Grasslike	Forb
<0.15	–	1-5%	0-5%	1-5%
>0.15 <= 0.3	–	1-10%	2-25%	1-10%
>0.3 <= 0.6	–	1-5%	25-40%	1-2%
>0.6 <= 1.4	–	0-1%	–	–
>1.4 <= 4	0-2%	–	–	–
>4 <= 12	0-2%	–	–	–
>12 <= 24	–	–	–	–
>24 <= 37	–	–	–	–
>37	–	–	–	–

Figure 6. Plant community growth curve (percent production by month). AZ3812, 38.2 16-20" p.z. all sites. Growth begins in the spring and continues into the summer and fall..

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	5	5	15	10	10	15	20	10	5	5	0

State 2
Native Annuals State

Community 2.1
Native Annuals Plant Community

Perennial grass canopy cover is reduced due to the interactions of drought, grazing and / or fire. Native and non-native annual forbs and grasses dominate the plant community. If this plant community persists for long periods of time; the seed-bank of native perennial grasses can diminish to a point where artificial reseeding will be necessary to return to a native potential plant community

State 3
Annual-Shrub Dominated State

Community 3.1
Annual and Shrub Dominated Plant Community

Shrubs like; mesquite, wait a bit mimosa, catclaw acacia and turbinella oak; succulents like; prickley pear, cholla and yucca, and trees like one-seed juniper, alligator juniper, redberry juniper and pinyon pine, invade from adjacent, shallow soil, areas, to dominate the site in the absense of fire. Native and non-native annual forbs and grasses dominate the understory. In "El Nino" years, herbaceous fuels can be sufficient to carry fire through the heavy canopy of shrubs. The major woody shrubs are, however, fire resistant once established.

State 4
Exotic Invaded State

Community 4.1
Exotic Forb and Grass Plant Community

Non-native annual grasses and forbs like; red brome, cheatgrass, kochia, tumble pigweed, russian thistle, tumble mustard, yellow starthistle, wild oats and filaree, can invade and dominate areas of the site with very low perennial grass cover. Perennial forbs like russian knapweed and leafy spurge could invade and, perhaps, dominate this site. These species can, over time, reduce the seed-bank of native annual grasses and forbs. Their presence can increase the fire frequency (of man made fires) especially where roads and urban areas are adjacent to areas of the site.

Additional community tables

Table 8. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Kg/Hectare)	Foliar Cover (%)
Grass/Grasslike					
1	**mid grasses**			336–785	
	sideoats grama	BOCU	*Bouteloua curtipendula*	112–560	–
	green sprangletop	LEDU	*Leptochloa dubia*	28–224	–
	tobosagrass	PLMU3	*Pleuraphis mutica*	56–224	–
	cane bluestem	BOBA3	*Bothriochloa barbinodis*	56–224	–
	plains lovegrass	ERIN	*Eragrostis intermedia*	28–112	–
2	**short grasses**			224–448	
	blue grama	BOGR2	*Bouteloua gracilis*	112–336	–
	black grama	BOER4	*Bouteloua eriopoda*	112–224	–
	sprucetop grama	BOCH	*Bouteloua chondrosioides*	0–112	–
	hairy grama	BOHI2	*Bouteloua hirsuta*	0–112	–
3	**cool season grasses**			56–336	
	squirreltail	ELEL5	*Elymus elymoides*	11–224	–
	prairie Junegrass	KOMA	*Koeleria macrantha*	11–224	–
4	**misc. perennial grasses**			11–56	
	threeawn	ARIST	*Aristida*	0–28	–
	Fendler threeawn	ARPUL	*Aristida purpurea var. longiseta*	0–28	–
	spidergrass	ARTE3	*Aristida ternipes*	0–28	–
	curly-mesquite	HIBE	*Hilaria belangeri*	0–28	–
	vine mesquite	PAOB	*Panicum obtusum*	0–28	–
	sand dropseed	SPCR	*Sporobolus cryptandrus*	0–28	–
	common wolfstail	LYPH	*Lycurus phleoides*	0–17	–

	creeping muhly	MURE	*Muhlenbergia repens*	0–11	–
	slender muhly	MUTE4	*Muhlenbergia tenuifolia*	0–11	–
	poverty threeawn	ARDI5	*Aristida divaricata*	0–11	–
	western wheatgrass	PASM	*Pascopyrum smithii*	0–11	–
	muttongrass	POFE	*Poa fendleriana*	0–11	–
	muttongrass	POFEL	*Poa fendleriana ssp. longiligula*	0–11	–
5	**annual grasses**			28–336	
	Mexican sprangletop	LEFUU	*Leptochloa fusca ssp. uninervia*	11–224	–
	mucronate sprangeltop	LEPAB	*Leptochloa panicea ssp. brachiata*	11–224	–
	Mexican panicgrass	PAHI5	*Panicum hirticaule*	6–224	–
	prairie threeawn	AROL	*Aristida oligantha*	6–112	–
	needle grama	BOAR	*Bouteloua aristidoides*	0–56	–
	sticky sprangletop	LEVI5	*Leptochloa viscida*	0–56	–
	sixweeks threeawn	ARAD	*Aristida adscensionis*	0–56	–
	feather fingergrass	CHVI4	*Chloris virgata*	0–56	–
	tufted lovegrass	ERPE	*Eragrostis pectinacea*	0–56	–
	desert lovegrass	ERPEM	*Eragrostis pectinacea var. miserrima*	0–56	–
	little barley	HOPU	*Hordeum pusillum*	0–56	–
	small fescue	VUMI	*Vulpia microstachys*	0–56	–
	Eastwood fescue	VUMIC	*Vulpia microstachys var. ciliata*	0–56	–
	sixweeks fescue	VUOC	*Vulpia octoflora*	6–56	–
	witchgrass	PACA6	*Panicum capillare*	0–56	–
	Bigelow's bluegrass	POBI	*Poa bigelovii*	0–28	–
	canyon cupgrass	ERLE7	*Eriochloa lemmonii*	0–28	–
	delicate muhly	MUFR	*Muhlenbergia fragilis*	0–28	–
	littleseed muhly	MUMI	*Muhlenbergia microsperma*	0–28	–
	sixweeks grama	BOBA2	*Bouteloua barbata*	0–28	–
	Arizona brome	BRAR4	*Bromus arizonicus*	0–28	–
	Arizona signalgrass	URAR	*Urochloa arizonica*	0–17	–
Forb					
6	**perennial forbs**			17–112	
	largeflower onion	ALMA4	*Allium macropetalum*	1–56	–
	Lewis flax	LILE3	*Linum lewisii*	0–56	–
	desert globemallow	SPAM2	*Sphaeralcea ambigua*	0–28	–
	copper globemallow	SPAN3	*Sphaeralcea angustifolia*	0–28	–
	brownplume wirelettuce	STPA4	*Stephanomeria pauciflora*	0–28	–
	weakleaf bur ragweed	AMCO3	*Ambrosia confertiflora*	1–28	–
	bluedicks	DICA14	*Dichelostemma capitatum*	1–28	–
	Indian rushpea	HOGL2	*Hoffmannseggia glauca*	1–28	–
	leastdaisy	CHAET2	*Chaetopappa*	0–17	–
	Greene's bird's-foot trefoil	LOGR4	*Lotus greenei*	0–17	–
	Wright's deervetch	LOWR	*Lotus wrightii*	0–17	–

	vetch	VICIA	*Vicia*	0–11	–
	rose heath	CHER2	*Chaetopappa ericoides*	0–11	–
	Texas bindweed	COEQ	*Convolvulus equitans*	0–11	–
	onion	ALLIU	*Allium*	0–11	–
	Forb, perennial	2FP	*Forb, perennial*	0–11	–
	scarlet spiderling	BOCO	*Boerhavia coccinea*	0–11	–
	ragwort	SENEC	*Senecio*	0–11	–
	sego lily	CANU3	*Calochortus nuttallii*	0–6	–
	brownfoot	ACWR5	*Acourtia wrightii*	0–6	–
	tuber anemone	ANTU	*Anemone tuberosa*	0–6	–
	Braun's rockcress	ARPE3	*Arabis perstellata*	0–6	–
	beeblossom	GAURA	*Gaura*	0–6	–
	southwestern mock vervain	GLGO	*Glandularia gooddingii*	0–6	–
	desert larkspur	DEPA	*Delphinium parishii*	0–6	–
	Parry's beardtongue	PEPA24	*Penstemon parryi*	0–6	–
	orange fameflower	PHAU13	*Phemeranthus aurantiacus*	0–6	–
	canaigre dock	RUHY	*Rumex hymenosepalus*	0–6	–
	twinleaf senna	SEBA3	*Senna bauhinioides*	0–6	–
7	**annual forbs**			6–336	
	common sunflower	HEAN3	*Helianthus annuus*	0–112	–
	longleaf false goldeneye	HELOA2	*Heliomeris longifolia var. annua*	0–56	–
	crestrib morning-glory	IPCO2	*Ipomoea costellata*	1–56	–
	spreading fleabane	ERDI4	*Erigeron divergens*	0–56	–
	Arizona popcornflower	PLAR	*Plagiobothrys arizonicus*	1–56	–
	creamcups	PLCA5	*Platystemon californicus*	0–56	–
	Forb, annual	2FA	*Forb, annual*	0–56	–
	aster	ASTER	*Aster*	0–56	–
	carelessweed	AMPA	*Amaranthus palmeri*	0–56	–
	New Mexico thistle	CINE	*Cirsium neomexicanum*	2–56	–
	goldeneye	VIGUI	*Viguiera*	0–56	–
	milkvetch	ASTRA	*Astragalus*	0–28	–
	Coulter's spiderling	BOCO2	*Boerhavia coulteri*	0–28	–
	lambsquarters	CHAL7	*Chenopodium album*	0–28	–
	aridland goosefoot	CHDE	*Chenopodium desiccatum*	0–28	–
	desert Indianwheat	PLOV	*Plantago ovata*	0–28	–
	woolly plantain	PLPA2	*Plantago patagonica*	0–28	–
	New Mexico plumeseed	RANE	*Rafinesquia neomexicana*	0–28	–
	miniature woollystar	ERDI2	*Eriastrum diffusum*	0–28	–
	miniature lupine	LUBI	*Lupinus bicolor*	0–28	–
	Coulter's lupine	LUSP2	*Lupinus sparsiflorus*	0–28	–
	hollowleaf annual lupine	LUSU3	*Lupinus succulentus*	0–28	–
	tanseyleaf tansyaster	MATA2	*Machaeranthera tanacetifolia*	0–28	–
	manybristle chinchweed	PEPA2	*Pectis papposa*	0–28	–

	California poppy	ESCAM	*Eschscholzia californica ssp. mexicana*	0–28	–
	western tansymustard	DEPI	*Descurainia pinnata*	0–28	–
	California goldfields	LACA7	*Lasthenia californica*	0–28	–
	camphorweed	HESU3	*Heterotheca subaxillaris*	0–28	–
	Thurber's pepperweed	LETH2	*Lepidium thurberi*	0–28	–
	foothill deervetch	LOHU2	*Lotus humistratus*	0–28	–
	coastal bird's-foot trefoil	LOSA	*Lotus salsuginosus*	0–28	–
	trefoil	LOTUS	*Lotus*	0–28	–
	Arizona lupine	LUAR4	*Lupinus arizonicus*	0–17	–
	Goodding's bladderpod	LEGO2	*Lesquerella gooddingii*	0–17	–
	shaggyfruit pepperweed	LELA	*Lepidium lasiocarpum*	0–17	–
	purslane	PORTU	*Portulaca*	0–17	–
	desert unicorn-plant	PRAL4	*Proboscidea althaeifolia*	0–17	–
	doubleclaw	PRPA2	*Proboscidea parviflora*	0–17	–
	sand fringepod	THCU	*Thysanocarpus curvipes*	0–17	–
	sleepy silene	SIAN2	*Silene antirrhina*	0–11	–
	ragwort	SENEC	*Senecio*	0–11	–
	phacelia	PHACE	*Phacelia*	0–11	–
	green carpetweed	MOVE	*Mollugo verticillata*	0–11	–
	evening primrose	OENOT	*Oenothera*	0–11	–
	grassleaf lettuce	LAGRA	*Lactuca graminifolia var. arizonica*	0–11	–
	sanddune wallflower	ERCA14	*Erysimum capitatum*	0–11	–
	American wild carrot	DAPU3	*Daucus pusillus*	0–11	–
	spurge	EUPHO	*Euphorbia*	0–11	–
	New Mexico fleabane	ERNE3	*Erigeron neomexicanus*	0–11	–
	sorrel buckwheat	ERPO4	*Eriogonum polycladon*	0–11	–
	bristly fiddleneck	AMTE3	*Amsinckia tessellata*	0–11	–
	annual agoseris	AGHE2	*Agoseris heterophylla*	0–11	–
	scrambled eggs	COAU2	*Corydalis aurea*	0–6	–
	cryptantha	CRYPT	*Cryptantha*	0–6	–
	Florida pellitory	PAFL3	*Parietaria floridana*	0–6	–
	spreading fanpetals	SIAB	*Sida abutifolia*	0–6	–
Shrub/Vine					
8	**shrubs**			0–56	
	catclaw acacia	ACGR	*Acacia greggii*	0–28	–
	catclaw mimosa	MIACB	*Mimosa aculeaticarpa var. biuncifera*	0–28	–
	velvet mesquite	PRVE	*Prosopis velutina*	0–28	–
	Sonoran scrub oak	QUTU2	*Quercus turbinella*	0–28	–
	skunkbush sumac	RHTR	*Rhus trilobata*	0–17	–
	pale desert-thorn	LYPA	*Lycium pallidum*	0–17	–
	algerita	MATR3	*Mahonia trifoliolata*	0–17	–
	fourwing saltbush	ATCA2	*Atriplex canescens*	0–17	–
	sugarberry	CELA	*Celtis laevigata*	0–11	–

9	**half shrubs**			56–168	
	bastardsage	ERWR	*Eriogonum wrightii*	45–168	–
	broom snakeweed	GUSA2	*Gutierrezia sarothrae*	0–28	–
	yerba de pasmo	BAPT	*Baccharis pteronioides*	1–28	–
	Coville's bundleflower	DECO4	*Desmanthus covillei*	0–17	–
	prairie acacia	ACAN	*Acacia angustissima*	0–17	–
10	**succulents**			0–56	
	walkingstick cactus	CYSP8	*Cylindropuntia spinosior*	0–28	–
	sacahuista	NOMI	*Nolina microcarpa*	0–28	–
	cactus apple	OPEN3	*Opuntia engelmannii*	0–28	–
	banana yucca	YUBA	*Yucca baccata*	0–17	–
	soaptree yucca	YUEL	*Yucca elata*	0–17	–
	Whipple cholla	CYWH	*Cylindropuntia whipplei*	0–17	–
	goldenflower century plant	AGCH2	*Agave chrysantha*	0–17	–
	chaparral yucca	HEWH	*Hesperoyucca whipplei*	0–11	–
	common sotol	DAWH2	*Dasylirion wheeleri*	0–11	–
	spinystar	ESVI2	*Escobaria vivipara*	0–6	–
Tree					
11	**evergreen trees**			0–28	
	redberry juniper	JUCO11	*Juniperus coahuilensis*	0–28	–
	alligator juniper	JUDE2	*Juniperus deppeana*	0–28	–
	oneseed juniper	JUMO	*Juniperus monosperma*	0–28	–
	twoneedle pinyon	PIED	*Pinus edulis*	0–28	–
	Utah juniper	JUOS	*Juniperus osteosperma*	0–17	–

Animal community

This site is suitable for grazing year round and is easily traversed by all classes of livestock. the site is very susceptible to erosion in overgrazed areas, old roads, cattle trails and concentration areas like bed grounds, water-lots and salt grounds.
The site has good habitat diversity for grassland wildlife species. Where it is adjacent to hill sites, with tree species or chaparral, it is a foraging area for elk.

Hydrological functions

This site produces runoff when soils are moist. Surfaces can be easily compacted by traffic and high densities of livestock when soils are moist. Normal depth of soil freezing in the winter is 5 to 6 inches. This will not break up compacted layers deeper than that. Compacted surfaces will produce much more runoff than surfaces with good tilth and structure.

Recreational uses

Hunting, camping, hiking, horseback riding, and backpacking.

Wood products

None

Other products

There is some native harvest of foods like wild onion, sunflower and thistle.

Contributors

Dan Robinett
Larry D. Ellicott

Rangeland health reference sheet

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

Author(s)/participant(s)	
Contact for lead author	
Date	
Approved by	
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

Indicators

1. **Number and extent of rills:**

2. **Presence of water flow patterns:**

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

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

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

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

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

8. **Soil surface (top few mm) resistance to erosion (stability values are averages - most sites will show a range of**

values):

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

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

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11. **Presence and thickness of compaction layer (usually none; describe soil profile features which may be mistaken for compaction on this site):**

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12. **Functional/Structural Groups (list in order of descending dominance by above-ground annual-production or live foliar cover using symbols: >>, >, = to indicate much greater than, greater than, and equal to):**

    Dominant:

    Sub-dominant:

    Other:

    Additional:

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13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):**

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14. **Average percent litter cover (%) and depth (in):**

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15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):**

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16. **Potential invasive (including noxious) species (native and non-native). List species which BOTH characterize degraded states and have the potential to become a dominant or co-dominant species on the ecological site if their future establishment and growth is not actively controlled by management interventions. Species that become dominant for only one to several years (e.g., short-term response to drought or wildfire) are not invasive plants. Note that unlike other indicators, we are describing what is NOT expected in the reference state for the ecological site:**

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17. **Perennial plant reproductive capability:**
