

## Ecological site R040XB209AZ Limy Slopes 7"-10" 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.

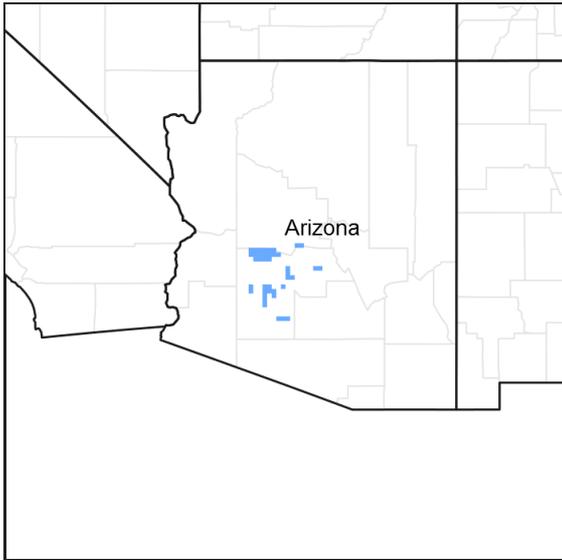


Figure 1. Mapped extent

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): 040X–Sonoran Basin and Range

AZ 40.2 – Middle Sonoran Desert

Elevations range from 1200 to 2000 feet and precipitation averages 7 to 10 inches per year. Vegetation includes saguaro, palo verde, creosotebush, triangle bursage, brittlebush, prickly pear, cholla, desert saltbush, wolfberry bush muhly, threeawns, and big galleta. The soil temperature regime is hyperthermic 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.

Table 1. Dominant plant species

Tree	Not specified
Shrub	(1) <i>Ambrosia deltoidea</i> (2) <i>Encelia farinosa</i>
Herbaceous	(1) <i>Pleuraphis rigida</i>

## Physiographic features

This site occurs on hillslopes and ridgetops. Slopes are from 15 to 45%. Elevations range from 1000 to 2200 feet.

Table 2. Representative physiographic features

Landforms	(1) Hill (2) Ridge
Elevation	1,000–2,200 ft
Slope	15–45%

## Climatic features

Precipitation in the sub-resource area ranges from 7 to 10 inches. Elevations range from 900 to 2050 feet. Winter-summer rainfall ratios range from 40% to 60% in the southern part along the international boundary, to 60% to 40% in the central and northern parts of the sub-resource area. As one moves from east to west in this resource area rains become more unpredictable and variable with Coefficients of Variation of annual rainfall equal to 38% at Florence and 46% at Aguila. Summer rains fall July- September, originate in the Gulf of Mexico, and are convective, usually brief, intense thunderstorms. Summer precipitation is extremely erratic and undependable in this area. Cool season moisture tends to be frontal, originates in the Pacific and Gulf of California, and falls in widespread storms with long duration and low intensity. This is the dependable moisture supply for vegetation in the area. Snow is very rare and usually melts on contact. May-June is the driest time of the year. Humidity is very low.

Winter temperatures are very mild with very few days recording freezing for short periods of time. Summertime temperatures are hot to very hot with many days in June-July exceeding 105 degrees F. Frost-free days range from 280 at stations in major river valleys with cold air drainage to 320 to 350 days at upland stations.

Both the spring and the summer growing seasons are equally important for perennial grass, forb and shrub growth. Cool and warm season annual forbs and grasses can be common in their respective seasons with above average rainfall. Perennial forage species can remain green throughout the year with available moisture.

Table 3. Representative climatic features

Frost-free period (average)	350 days
Freeze-free period (average)	0 days
Precipitation total (average)	10 in

## Influencing water features

### Soil features

These are moderately deep to deep soils formed in very gravelly alluvium of moderate age and from mixed origins. They are very calcareous and have over 35% gravels in the soil profile. Plant-soil moisture relationships are poor.

Soils mapped on this site include: SSA-645 Aguila-Carefree area MU Nickel-39; SSA-651 Central Maricopa County MU, Calciorthids-CA2 & Torriorthents-CA2; SSA-653 Gila Bend-Ajo area MU Ajo-3.

Table 4. Representative soil features

Surface texture	(1) Gravelly sandy loam (2) Very gravelly fine sandy loam (3) Extremely gravelly
Family particle size	(1) Loamy
Drainage class	Well drained

Permeability class	Moderate to moderately rapid
Soil depth	40–60 in
Surface fragment cover ≤3"	15–65%
Surface fragment cover >3"	1–10%
Available water capacity (0-40in)	3–6 in
Calcium carbonate equivalent (0-40in)	5–35%
Electrical conductivity (0-40in)	0–2 mmhos/cm
Sodium adsorption ratio (0-40in)	0
Soil reaction (1:1 water) (0-40in)	7.9–8.4
Subsurface fragment volume ≤3" (Depth not specified)	15–65%
Subsurface fragment volume >3" (Depth not specified)	1–10%

## Ecological dynamics

The plant communities found on an ecological site are naturally variable. Composition and production will vary with yearly conditions, location, aspect, and the natural variability of the soils. The Historical Climax Plant Community represents the natural potential plant communities found on relict or relatively undisturbed sites. Other plant communities described here represent plant communities that are known to occur when the site is disturbed by factors such as fire, grazing, or drought.

Production data provided in this site description is standardized to air dry weight at the end of the summer growing season. The plant communities described in this site description are based on near normal rainfall years.

NRCS uses a Similarity Index to compare existing plant communities to the plant communities described here. Similarity Index is determined by comparing the production and composition of a plant community to the production and composition of a plant community described in this site description. To determine Similarity Index, compare the production (air dry weight) of each species to that shown in the plant community description. For each species, count no more than the maximum amount shown for the species, and for each group, count no more than the maximum amount shown for the group. Divide the resulting total by the total normal year production shown in the plant community description. If the rainfall has been significantly above or below normal, use the total production shown for above or below normal years. If field data is not collected at the end of the summer growing season, then the field data must be corrected to the end of the year production before comparing it to the site description. The growth curve can be used as a guide for estimating production at the end of the summer growing season.

## State and transition model



**State 1  
Historical Climax Plant Community**

**Community 1.1  
Historical Climax Plant Community**

The potential plant community on this site is a mixture of desert shrubs, cacti, perennial grasses and forbs. Annual grasses and forbs make up a small percentage of the potential community. The aspect is shrubland. Perennial grasses and forbs quickly disappear from the plant community with heavy grazing or from drought. Most of the shrubby species on the site are unpalatable and little change has occurred in the composition of these species with past heavy grazing use. A few, cool season, introduced annuals like; red brome, mediterranean grass and london rocket mustard occur on areas of this site and may compete with native annual forbs and grasses. The surfaces of these soils are usually very well protected by covers of gravels, cobbles and caliche fragments. Cryptogam cover is usually very low. Plant populations per acre for major species include; 200 to 300 for creosotebush, 200 to 400 for the ratany-bursage group, and 50 to 100 for cholla species.

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

Plant Type	Low (Lb/Acre)	Representative Value (Lb/Acre)	High (Lb/Acre)
Shrub/Vine	195	—	255
Forb	30	—	45
Grass/Grasslike	15	—	45
<b>Total</b>	<b>240</b>	<b>—</b>	<b>345</b>

## Additional community tables

Table 6. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Lb/Acre)	Foliar Cover (%)
<b>Grass/Grasslike</b>					
1				15–30	
	blue threeawn	ARPUN	<i>Aristida purpurea</i> var. <i>nealleyi</i>	0–10	–
	bush muhly	MUPO2	<i>Muhlenbergia porteri</i>	0–10	–
	purple threeawn	ARPU9	<i>Aristida purpurea</i>	0–5	–
	big galleta	PLRI3	<i>Pleuraphis rigida</i>	0–5	–
	Parish's threeawn	ARPUP5	<i>Aristida purpurea</i> var. <i>parishii</i>	0–2	–
	Wright's threeawn	ARPUW	<i>Aristida purpurea</i> var. <i>wrightii</i>	0–2	–
	spidergrass	ARTE3	<i>Aristida ternipes</i>	0–1	–
	spidergrass	ARTEG	<i>Aristida ternipes</i> var. <i>gentilis</i>	0–1	–
	low woollygrass	DAPU7	<i>Dasyochloa pulchella</i>	0–1	–
	Arizona cottontop	DICA8	<i>Digitaria californica</i>	0–1	–
	nineawn pappusgrass	ENDE	<i>Enneapogon desvauxii</i>	0–1	–
	plains bristlegrass	SEVU2	<i>Setaria vulpiseta</i>	0–1	–
	sand dropseed	SPCR	<i>Sporobolus cryptandrus</i>	0–1	–
	slim tridens	TRMU	<i>Tridens muticus</i>	0–1	–
	whiplash pappusgrass	PAVA2	<i>Pappophorum vaginatum</i>	0–1	–
2				3–15	
	needle grama	BOAR	<i>Bouteloua aristidoides</i>	0–5	–
	sixweeks grama	BOBA2	<i>Bouteloua barbata</i>	0–5	–
	Rothrock's grama	BORO2	<i>Bouteloua rothrockii</i>	0–5	–
	Eastwood fescue	VUMIC	<i>Vulpia microstachys</i> var. <i>ciliata</i>	0–5	–
	Pacific fescue	VUMIP	<i>Vulpia microstachys</i> var. <i>pauciflora</i>	0–5	–
	Arizona brome	BRAR4	<i>Bromus arizonicus</i>	0–1	–
	feather fingergrass	CHVI4	<i>Chloris virgata</i>	0–1	–
	canyon cupgrass	ERLE7	<i>Eriochloa lemmonii</i>	0–1	–
	desert lovegrass	ERPEM	<i>Eragrostis pectinacea</i> var. <i>miserrima</i>	0–1	–
	tufted lovegrass	ERPEP2	<i>Eragrostis pectinacea</i> var. <i>pectinacea</i>	0–1	–
	Mexican sprangletop	LEFUU	<i>Leptochloa fusca</i> ssp. <i>uninervia</i>	0–1	–
	mucronate sprangletop	LEPA6	<i>Leptochloa panicea</i>	0–1	–
	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	–
	Arizona signalgrass	URAR	<i>Urochloa arizonica</i>	0–1	–
3				3–15	
	Alga	2ALGA	<i>Alga</i>	0–10	–
	Fungus	2FUNGI	<i>Fungus</i>	0–2	–
	Lichen	2LICHN	<i>Lichen</i>	0–2	–
	Moss	2MOSS	<i>Moss</i>	0–2	–
	strigose bird's-foot	LOSTT	<i>Lotus strigosus</i> var. <i>tomentellus</i>	0–1	–

	trefoil				
<b>Forb</b>					
4				15–30	
	desert globemallow	SPAM2	<i>Sphaeralcea ambigua</i>	5–10	–
	desert trumpet	ERIN4	<i>Eriogonum inflatum</i>	2–5	–
	Parry's false prairie-clover	MAPA7	<i>Marina parryi</i>	0–2	–
	lacy tansyaster	MAPIP4	<i>Machaeranthera pinnatifida</i> ssp. <i>pinnatifida</i> var. <i>pinnatifida</i>	0–2	–
	rough menodora	MESC	<i>Menodora scabra</i>	0–1	–
	evening primrose	OENOT	<i>Oenothera</i>	0–1	–
	slender poreleaf	POGR5	<i>Porophyllum gracile</i>	0–1	–
	Coues' cassia	SECO10	<i>Senna covesii</i>	0–1	–
	California fagonbush	FALA	<i>Fagonia laevis</i>	0–1	–
	paleface	HIDE	<i>Hibiscus denudatus</i>	0–1	–
	slender janusia	JAGR	<i>Janusia gracilis</i>	0–1	–
	brownplume wirelettuce	STPA4	<i>Stephanomeria pauciflora</i>	0–1	–
	dwarf desertpeony	ACNA2	<i>Acourtia nana</i>	0–1	–
	brownfoot	ACWR5	<i>Acourtia wrightii</i>	0–1	–
	poreleaf dogweed	ADPO2	<i>Adenophyllum porophyllum</i>	0–1	–
	trailing windmills	ALIN	<i>Allionia incarnata</i>	0–1	–
	narrowleaf silverbush	ARLA12	<i>Argythamnia lanceolata</i>	0–1	–
	New Mexico silverbush	ARNE2	<i>Argythamnia neomexicana</i>	0–1	–
	rush milkweed	ASSU	<i>Asclepias subulata</i>	0–1	–
	desert marigold	BAMU	<i>Baileya multiradiata</i>	0–1	–
	whitemargin sandmat	CHAL11	<i>Chamaesyce albomarginata</i>	0–1	–
	desert larkspur	DEPA	<i>Delphinium parishii</i>	0–1	–
	tall mountain larkspur	DESC	<i>Delphinium scaposum</i>	0–1	–
	bluedicks	DICA14	<i>Dichelostemma capitatum</i>	0–1	–
5				3–15	
	sand pygmyweed	CRCO34	<i>Crassula connata</i>	0–3	–
	combseed	PECTO	<i>Pectocarya</i>	0–3	–
	woolly tidentromia	TILA2	<i>Tidentromia lanuginosa</i>	0–3	–
	coastal bird's-foot trefoil	LOSAB	<i>Lotus salsuginosus</i> var. <i>brevivexillus</i>	0–2	–
	strigose bird's-foot trefoil	LOSTT	<i>Lotus strigosus</i> var. <i>tomentellus</i>	0–2	–
	cryptantha	CRYPT	<i>Cryptantha</i>	0–2	–
	hairy prairie clover	DAMO	<i>Dalea mollis</i>	0–1	–
	American wild carrot	DAPU3	<i>Daucus pusillus</i>	0–1	–
	western tansymustard	DEPI	<i>Descurainia pinnata</i>	0–1	–
	flatcrown buckwheat	ERDE6	<i>Eriogonum deflexum</i>	0–1	–
	miniature woollystar	ERDI2	<i>Eriastrum diffusum</i>	0–1	–
	erigenia	ERIGE	<i>Erigenia</i>	0–1	–
	buckwheat	ERIOG	<i>Eriogonum</i>	0–1	–
	Texas stork's bill	ERTE13	<i>Erodium texanum</i>	0–1	–

	California poppy	ESCAM	<i>Eschscholzia californica ssp. mexicana</i>	0–1	–
	pygmy poppy	ESMI	<i>Eschscholzia minutiflora</i>	0–1	–
	gilia	GILIA	<i>Gilia</i>	0–1	–
	Gordon's bladderpod	LEGO	<i>Lesquerella gordonii</i>	0–1	–
	shaggyfruit pepperweed	LELA	<i>Lepidium lasiocarpum</i>	0–1	–
	foothill deervetch	LOHU2	<i>Lotus humistratus</i>	0–1	–
	common fiddleneck	AMMEI2	<i>Amsinckia menziesii var. intermedia</i>	0–1	–
	bristly fiddleneck	AMTE3	<i>Amsinckia tessellata</i>	0–1	–
	milkvetch	ASTRA	<i>Astragalus</i>	0–1	–
	Coulter's spiderling	BOCO2	<i>Boerhavia coulteri</i>	0–1	–
	hoary bowlesia	BOIN3	<i>Bowlesia incana</i>	0–1	–
	California suncup	CACA32	<i>Camissonia californica</i>	0–1	–
	exserted Indian paintbrush	CAEXE	<i>Castilleja exserta ssp. exserta</i>	0–1	–
	yellow tackstem	CAPA7	<i>Calycoseris parryi</i>	0–1	–
	white tackstem	CAWR	<i>Calycoseris wrightii</i>	0–1	–
	brittle spineflower	CHBR	<i>Chorizanthe brevicornu</i>	0–1	–
	pebble pincushion	CHCA	<i>Chaenactis carphoclinia</i>	0–1	–
	hyssopleaf sandmat	CHHY3	<i>Chamaesyce hyssopifolia</i>	0–1	–
	devil's spineflower	CHRI	<i>Chorizanthe rigida</i>	0–1	–
	Esteve's pincushion	CHST	<i>Chaenactis stevioides</i>	0–1	–
	New Mexico thistle	CINE	<i>Cirsium neomexicanum</i>	0–1	–
	Arizona lupine	LUAR4	<i>Lupinus arizonicus</i>	0–1	–
	Coulter's lupine	LUSP2	<i>Lupinus sparsiflorus</i>	0–1	–
	blazingstar	MENTZ	<i>Mentzelia</i>	0–1	–
	bristly nama	NAHI	<i>Nama hispidum</i>	0–1	–
	glandular threadplant	NEGL	<i>Nemacladus glanduliferus</i>	0–1	–
	Florida pellitory	PAFL3	<i>Parietaria floridana</i>	0–1	–
	manybristle chinchweed	PEPA2	<i>Pectis papposa</i>	0–1	–
	phacelia	PHACE	<i>Phacelia</i>	0–1	–
	desert Indianwheat	PLOV	<i>Plantago ovata</i>	0–1	–
	New Mexico plumeseed	RANE	<i>Rafinesquia neomexicana</i>	0–1	–
	chia	SACO6	<i>Salvia columbariae</i>	0–1	–
	sleepy silene	SIAN2	<i>Silene antirrhina</i>	0–1	–
	Coulter's globemallow	SPCO2	<i>Sphaeralcea coulteri</i>	0–1	–
	woollyhead neststraw	STMI2	<i>Stylocline micropoides</i>	0–1	–
<b>Shrub/Vine</b>					
6				90–135	
	creosote bush	LATR2	<i>Larrea tridentata</i>	90–135	–
7				30–60	
	triangle bur ragweed	AMDE4	<i>Ambrosia deltoidea</i>	15–30	–
	burrobush	AMDU2	<i>Ambrosia dumosa</i>	15–30	–
	brittlebush	ENFA	<i>Encelia farinosa</i>	0–5	–
8				15–30	

	white ratany	KRGR	<i>Krameria grayi</i>	10–20	–
	littleleaf ratany	KRER	<i>Krameria erecta</i>	5–10	–
9				15–30	
	yellow paloverde	PAMI5	<i>Parkinsonia microphylla</i>	0–5	–
	desert ironwood	OLTE	<i>Olneya tesota</i>	0–3	–
	ocotillo	FOSP2	<i>Fouquieria splendens</i>	0–2	–
	desert lavender	HYEM	<i>Hyptis emoryi</i>	0–1	–
	sangre de cristo	JACA2	<i>Jatropha cardiophylla</i>	0–1	–
	crown of thorns	KOSP	<i>Koeberlinia spinosa</i>	0–1	–
	water jacket	LYAN	<i>Lycium andersonii</i>	0–1	–
	Arizona desert-thorn	LYEX	<i>Lycium exsertum</i>	0–1	–
	desert wolfberry	LYMA	<i>Lycium macrodon</i>	0–1	–
	velvet mesquite	PRVE	<i>Prosopis velutina</i>	0–1	–
	whitestem paperflower	PSCO2	<i>Psilostrophe cooperi</i>	0–1	–
	dwarf saltwort	SABI	<i>Salicornia bigelovii</i>	0–1	–
	Mexican bladdersage	SAME	<i>Salazaria mexicana</i>	0–1	–
	jojoba	SICH	<i>Simmondsia chinensis</i>	0–1	–
	woody crinklemat	TICAC	<i>Tiquilia canescens var. canescens</i>	0–1	–
	American threefold	TRCA8	<i>Trixis californica</i>	0–1	–
	Parish's goldeneye	VIPA14	<i>Viguiera parishii</i>	0–1	–
	desert zinnia	ZIAC	<i>Zinnia acerosa</i>	0–1	–
	lotebush	ZIOB	<i>Ziziphus obtusifolia</i>	0–1	–
	whitethorn acacia	ACCO2	<i>Acacia constricta</i>	0–1	–
	catclaw acacia	ACGR	<i>Acacia greggii</i>	0–1	–
	rayless goldenhead	ACSP	<i>Acamptopappus sphaerocephalus</i>	0–1	–
	Coulter's brickellbush	BRCO	<i>Brickellia coulteri</i>	0–1	–
	button brittlebush	ENFR	<i>Encelia frutescens</i>	0–1	–
	Nevada jointfir	EPNE	<i>Ephedra nevadensis</i>	0–1	–
10				15–30	
	senita cactus	PASC14	<i>Pachycereus schottii</i>	0–2	–
	organpipe cactus	STTH3	<i>Stenocereus thurberi</i>	0–2	–
	beavertail pricklypear	OPBA2	<i>Opuntia basilaris</i>	0–1	–
	Engelmann's hedgehog cactus	ECEN	<i>Echinocereus engelmannii</i>	0–1	–
	Leconte's barrel cactus	FECYL	<i>Ferocactus cylindraceus var. lecontei</i>	0–1	–
	candy barrelcactus	FEWI	<i>Ferocactus wislizeni</i>	0–1	–
	common fishhook cactus	MATE4	<i>Mammillaria tetrancistra</i>	0–1	–

## Animal community

This site produces small amounts of herbaceous and shrubby forage for year-round use. Even in wet winters the production of cool season annuals is low and provides for little additional carrying capacity.

This site is home to a variety of desert mammals, birds and reptiles. Though cover is lacking, topography provides enough security for the site to support the larger desert mammals. Desert tortoises den in pockets and caverns

under caliche outcrops on steep slopes and along drainage ways.

## Other information

T&E: *Antilocapra americana sonoriensis*

(Sonoran pronghorn)

*Leptonycteris curasoae* yerbe buena

(Lesser long-nosed bat)

## Type locality

Location 1: Maricopa County, AZ	
Township/Range/Section	T7S R2W S2
General legal description	Buckeye FO - Sand Tank Mountains
Location 2: Maricopa County, AZ	
Township/Range/Section	T1N R8E S22
General legal description	Chandler FO - Apache Junction
Location 3: Pima County, AZ	
Township/Range/Section	T13S R8E S20
General legal description	Sells FO - Shuck Toak Dist., Aguirre Valley
Location 4: Pima County, AZ	
Township/Range/Section	T15S R7W S20
General legal description	Tucson FO - Organ Pipe National Monument

## Contributors

Dan Robinett

Dan Robinett, J. Norris

Larry D. Ellicott

Steve Barker

## Rangeland health reference sheet

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

Author(s)/participant(s)	Dave Womack, Dan Robinett, Emilio Carrillo
Contact for lead author	NRCS Tucson Area Office
Date	12/28/2005
Approved by	S. Cassidy
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

## Indicators

1. **Number and extent of rills:** Rills are common and continuous in absence of high gravel cover.

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2. **Presence of water flow patterns:** Water flow patterns are common, continuous and occupy 15-20% of area.
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3. **Number and height of erosional pedestals or terracettes:** Erosional pedestals not present on most perennial plants.
- 
4. **Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):** 10-30% (low values in high gravel cover areas and/or in El Nino years)
- 
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):** Woody litter mostly stays under plant canopy; herbaceous litter can travel long distances.
- 
8. **Soil surface (top few mm) resistance to erosion (stability values are averages - most sites will show a range of values):** Soil surface resistance to erosion is good under shrub canopies to moderate in interspaces due to crusts formed by raindrop impact.
- 
9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** weak thin platy to granular; A horizon is 4 inches. Accumulated pedestals on most perennial plants, not so much so in high gravel cover areas, 2-5 inches high.
- 
10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:** Cover estimated as: canopy 5-10%, Basal 1%; 80-85% shrubs, 5-10% halfshrubs, 5-10% succulents. Cover is well dispersed throughout the site.
- 
11. **Presence and thickness of compaction layer (usually none; describe soil profile features which may be mistaken for compaction on this site):** none
- 
12. **Functional/Structural Groups (list in order of descending dominance by above-ground annual-production or live foliar cover using symbols: >>, >, = to indicate much greater than, greater than, and equal to):**
- Dominant: shrubs > halfshrubs > succulents > trees > annual grasses & forbs > perennial forbs = perennial grasses  
(note: in El Nino years annual forbs and grasses are #1 in above ground weight.)

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):** 0-50% canopy mortality
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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):** 250 lbs/ac unfavorable precipitation, 350 lbs/ac normal precipitation, 500 lbs/ac 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:** Sahara mustard, schismus, filaree
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17. **Perennial plant reproductive capability:** Not impaired for shrubs, drought impaired for perennial grasses and forbs.
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