

Ecological site R040XB207AZ Limy Fan 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.

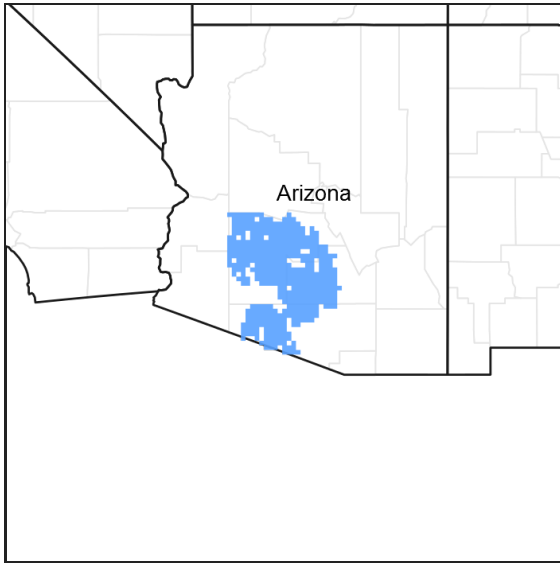


Figure 1. Mapped extent

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, bursage, ratany, 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 typical 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.

Classification relationships

MLRA 40, Sonoran Basin and Range

Forest Service Section 322B, Sonoran Desert

EPA Level III Ecoregion 81, Sonoran Basin and Range.

91% of MLRA overlap.

Ecological site concept

Limy fan ecological site occurs on gently sloping uplands. All moisture is received from precipitation without additional moisture inputs from on-site surface flow. Slopes are generally less than three percent. The calcareous, alluvial soils are deep with less than 35% rock fragments.

Table 1. Dominant plant species

Tree	Not specified
Shrub	(1) <i>Larrea tridentata</i> (2) <i>Ambrosia deltoidea</i>
Herbaceous	Not specified

Physiographic features

This site occurs on fan terraces and stream terraces. Slopes are from 1 to 3%. Elevations range from about 1000 to 2000 feet.

Table 2. Representative physiographic features

Landforms	(1) Fan (2) Stream terrace
Flooding frequency	None
Ponding frequency	None
Elevation	305–610 m
Slope	1–3%
Aspect	Aspect is not a significant factor

Climatic features

Precipitation in the sub-resource area ranges from 7 to 10 inches; mean precipitation from weather stations listed below is 8.35 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. These cool season rains provide 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.

Temperatures fluctuate about 30 degrees from nighttime lows to daytime highs. Winter temperatures are very mild with very few days recording freezing. Summertime temperatures are hot to very hot with many days in June-July exceeding 105 degrees F. High and low temperatures recorded at the stations listed below are 125 and 11 degrees Fahrenheit. The temperature table below shows the average monthly high and low temperatures for all listed stations.

Both the spring and the summer growing seasons are equally important for perennial grass, forb and shrub growth; plant growing conditions are favorable nearly yearlong. Annual forb and grass growth is highly dependent upon rainfall; annuals can dominate the landscape with unusually high precipitation. Perennial forbs and grasses can remain green throughout the year with available moisture.

Table 3. Representative climatic features

Frost-free period (average)	291 days
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Freeze-free period (average)	337 days
Precipitation total (average)	229 mm

Climate stations used

- (1) FLORENCE [USC00023027], Florence, AZ
- (2) LAVEEN 3 SSE [USC00024829], Phoenix, AZ
- (3) ORGAN PIPE CACTUS NM [USC00026132], West Pima County, AZ
- (4) KOFA MINE [USC00024702], Wellton, AZ
- (5) LITCHFIELD PARK [USC00024977], Goodyear, AZ
- (6) PHOENIX SKY HARBOR INTL AP [USW00023183], Phoenix, AZ
- (7) CASA GRANDE [USC00021306], Casa Grande, AZ

Influencing water features

This site does not benefit from run-on moisture. Rills are common and continuous in areas without gravel cover. Water flow patterns are common and continuous, occupying 15-20 percent of the area. Gullies are not present.

Soil features

These are deep soils formed in loamy alluvium of moderate age and from mixed origins. They range from sandyloam to loam surface textures. They are calcareous throughout. They are not skeletal. Plant-soil moisture relationships are poor to fair. On areas without gravel cover, pedestals accumulate under woody species 2 to 5 inches high. Soil compaction is not normal on the site. Bare ground ranges from 10 to 60 percent on the site. The soil surface is resistant to erosion due to surface crusting formed by raindrop impact.

This site is mapped in 9 Soil Survey areas across the CRA's in South western Arizona.

Soils mapped on this site include: SSA-627 Southern Mohave County MU's Rillino-37, 97 & 98, Tres Hermanos-35 & 98; SSA-645 Aguila-Carefree area MU's Antho-1 & 2, Estrella-50, Gila-54, Gilman-55 & 57, Glenbar-60, Rillito-70, 101, 116 & 118, Mohall (calcareous surface)-76 & 78, Mohave-84 & 87, Tremant(calcareous surface)-112 & 113, Tres Hermanos-120, Vallencia-124; SSA-651 Central Maricopa County MU's Antho-AbA, AbB, AdB, Ae, AfA, AfB, AGB, AHC, AkB, AL, AM, GM & Go3, Coolidge-Cp, CrB, Cs & CV, Estrella-Es, Gilman-GgA, GgB, GM, GN & Go3, Laveen-CV, GN, HM, Lb, LcA, LcB, LF & MV, Perryville-Pa, PeA, PeB, PRB & RpE, Rillito-GxA, GxB, GYD, HrB, PRB, RaA, RaB, RbB, RhB, RpE, TrA, TrB & TSC, Tucson-Tu & Tw, Valencia-AM, Va & Vc & Wintersburg-Wg; SSA-653 Gila Bend-Ajo area MU's Coolidge-20, Dateland-5 & 14, Denure (calcareous surface)-20 & 21, & Rillito-21 & 37; SSA-658 Gila River Indian Reservation MU's Denure (calcareous surface)-13 & 14, & Pahaka(calcareous surface)-13 & 14; SSA-659 Western Pinal County MU's Coolidge-11, Dateland-13, Denure(calcareous surface)-16, 17, 18 & 44, Laveen-28, & Tremant-44; SSA-661 Eastern Pinal-Souther Gila Counties MU's Coolidge-265, Dateland-206 & 345, Denure(calcareous surface)-206, 320 & 340, Laveen-213 & 335, Pinamt(<50% gravels)-565, & Tremant-565; SSA-669 Eastern Pima County MU's Dateland-21, Denure(calcareous surface)-21 & Pahaka(calcareous surface)-53; SSA-703 Tohono O'odham area MU's Dateland-15, Denure(calcareous surface)-15 & 19, Rillito-33, Sasco-55 & Wintersburg-62. Subsurface texture may include fine or coarse loamy.

Table 4. Representative soil features

Surface texture	(1) Gravelly sandy loam (2) Gravelly fine sandy loam (3) Gravelly loam
Family particle size	(1) Loamy
Drainage class	Well drained
Permeability class	Moderately slow to moderately rapid
Soil depth	152 cm
Surface fragment cover <=3"	0-15%
Surface fragment cover >3"	0%

Available water capacity (0-101.6cm)	21.34–27.43 cm
Calcium carbonate equivalent (0-101.6cm)	3–25%
Electrical conductivity (0-101.6cm)	0–2 mmhos/cm
Sodium adsorption ratio (0-101.6cm)	0
Soil reaction (1:1 water) (0-101.6cm)	7.9–8.4
Subsurface fragment volume <=3" (Depth not specified)	0–15%
Subsurface fragment volume >3" (Depth not specified)	0%

Ecological dynamics

The 40-2AZ Limy Fan Reference State (see State and Transition Model below) is dominated by creosote and the sub-shrubs, bursage and ratany. The perennial grasses, big galleta and bush muhly, are generally confined to areas with additional moisture inputs such as rills or small depressions; other perennial grasses may occasionally be found. Several species of shrubs, cacti, other succulents and forbs are represented in the plant community. Annual forbs and grasses proliferate after nearly any good rainfall. The aspect is open shrubland.

Anthropogenic changes in the plant community and ecosystem function occur as disturbances to the Reference State occur. Long-term disturbances, such as introduction of non-native plant species, unmanaged livestock grazing can exceed the site's resilience or ability to recover. The long-lasting changes in hydrologic functioning, site stability and biotic integrity are reflected in the change in productivity and plant community. Rainfall does not favor site recovery after a threshold is crossed; therefore, complete restoration to the Reference State is not feasible. Of course, cessation of off-road vehicle travel, planned road/trail development and application of prescribed grazing will limit transition to a less desirable state.

Fire from human ignition may occasionally occur if dry standing crop of annual forb (either native or non-native forbs) is exceptionally high; natural fire seldom occurs. The Barren State results from a burn.

Non-native annual forbs and/or non-native annual grasses may become present on Limy Fans through natural spread (wind, water) or mechanical transport (via contaminated hay, vehicles, livestock, or wildlife); although present, non-natives may co-exist with native annuals. However, after non-native annual forb seed is present, disturbance may result in annual forbs dominating the understory (Exotic Annuals State). The shrubland aspect, soil stability, and hydrologic functioning remain similar to the Reference State; however, biotic integrity of the site may be altered since the non-native annuals may permanently replace natives.

Long-term, continuous grazing will eliminate forage species from the RPC pushing the site into the Shrub State. Perennial grasses are first to fall out of the community followed by perennial forbs and ratany. Bursage may persist in low numbers. Site hydrology will be affected with decreased infiltration and increased run-off.

The Eroded State occurs as run-off accelerates soil erosion forming pedestals and gullies. Roads and vehicle trails alter surface water flow on either the Reference State or the Shrub Dominated State channel water, creating accelerated run-off within small points causing nick-points of headcuts. Roads can become entrenched. The Shrub Dominated State is vulnerable to transitioning to the Eroded State due to lack of cover.

State and transition model

40-2AZ Limy Fan 7-10" p.z. (R040XB207AZ)

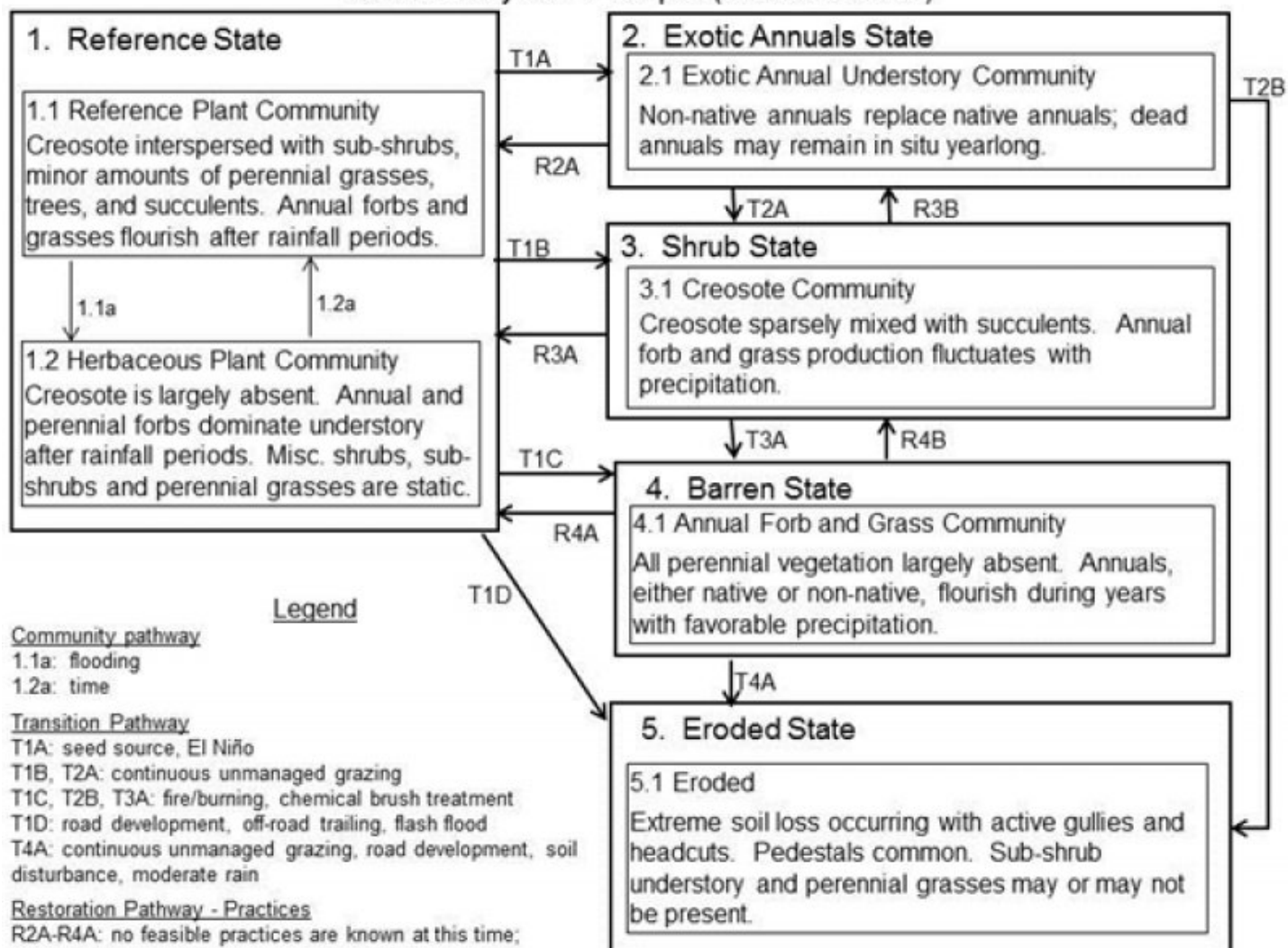


Figure 6. 40-2AZ Limy Fan, 7-10" p.z. STM

**State 1
Reference**

**Community 1.1
Reference Plant Community**

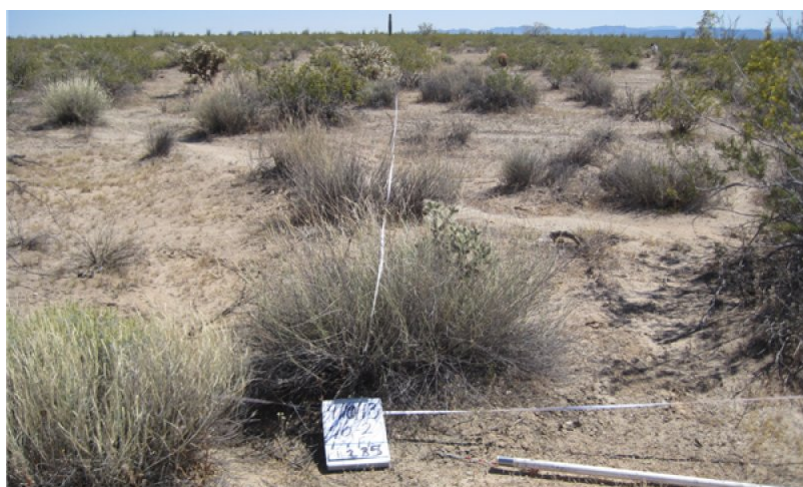


Figure 7. Limy Fan, 7-10" p.z., Reference Community

The potential plant community is a mixture of desert shrubs and sub-shrubs with cacti, perennial grasses and annuals well represented throughout. Creosote dominates with a wide range of other shrubs present, such as wolfberry, palo verde, graythorn, or ironwood, sparsely present. Sub-shrubs, an even mix of bursage and ratany,

make up the sub-dominant, woody understory. Perennial grasses are somewhat constrained to waterflow paths and can be represented by a variety of species but most commonly bush muhly and big galleta are found. A variety of succulents, cholla species, prickly pears, cereus and barrel cacti are scattered on the site; saguaro may or may not be present. A wide variety of annual forbs and annual grasses are found nearly year-round after precipitation events due to the favorable growing conditions; annual production from annuals can exceed 100 #s/acre during a wet year. The aspect is open shrubland. The soil surface generally lacks a protective gravel cover, but usually has extensive cryptogam cover. Cryptogam cover ranges from 10 to 15% on the site. These lichens are communities made up of associations of blue green algae and fungi, which fix atmospheric nitrogen and form surface crusts that reduce erosion by both wind and water. With severe disturbance of these crusts, sheet and rill erosion can accelerate and dust blowing can be a problem. Plant populations for creosotebush ranges from 100 to 700 plants per acre. Some areas of this site receive rare flooding (once every 20 to 50 years). These events may cause severe mortality of creosotebush. Reestablishment is quick, however and the plant community soon is back to normal.

Table 5. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Shrub/Vine	157	–	314
Forb	20	–	118
Grass/Grasslike	20	–	78
Total	197	–	510

State 2 Exotic Annuals

Community 2.1 Exotic Annual Understory

A few cool season, introduced annuals like; filaree, mediterranean grass and london rocket mustard can become entrenched in areas of this site and compete with native annual forbs and grasses. No mechanism to remove non-native annuals is known and once non-native annuals dominate this ecological site, disturbance drivers will follow the transitional paths as those from the reference state; therefore, States 3, 4, and 5 may have non-native annuals dominate the annual forbs and grass communities. Wildlife habitat may be impaired because the non-native forbs do not provide adequate food and cover. Fire fuel loading after a flourish of either non-native or native annuals may carry fire.

State 3 Shrub

Community 3.1 Creosote Community

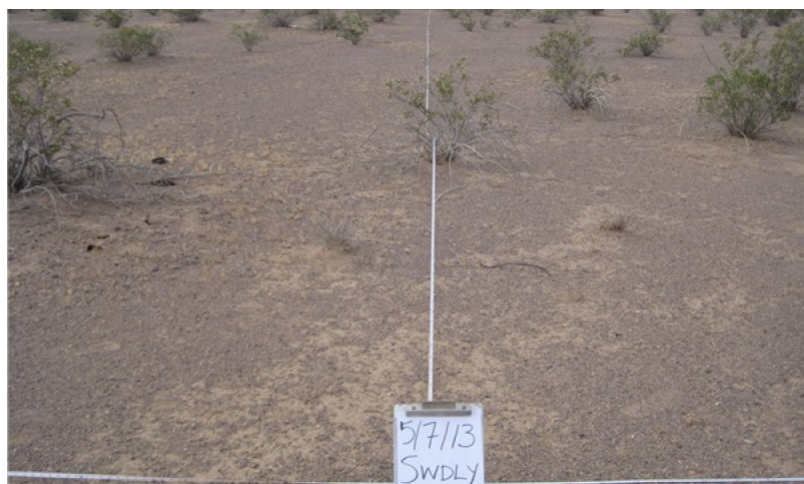


Figure 9. Limy Fan, 7-10" p.z., Creosote Community

Annual forbs and grasses (both native and exotic) will fluctuate with climate. This appears to be a stable community without fire or other disturbance like continuous grazing

State 4 Barren

Community 4.1 Annual Forb and Annual Grass Community

Occasionally, after an unusually high production of annual forbs, a fire will burn. Natural fires are extremely rare, however, and if Limy Fan burns it is generally from human ignition.

State 5 Eroded

Community 5.1 Eroded



Figure 10. Limy Fan, 7-10" p.z., Eroded

Transition T1A State 1 to 2

Transition T1B State 1 to 3

Transition T1C State 1 to 4

Transition T1D State 1 to 5

Restoration pathway R2A State 2 to 1

Conservation practices

Fence
Firebreak
Livestock Pipeline
Pumping Plant

Access Road
Watering Facility
Water Harvesting Catchment
Water Well
Upland Wildlife Habitat Management
Livestock Shade Structure
Livestock Use Area Protection
Prescribed Grazing
TA Planning
TA Design
TA Application
TA Check-Out
Fish and Wildlife Structure
Fish and Wildlife Habitat Plan - Written
Fish and Wildlife Habitat Plan - Applied

**Restoration pathway R3A
State 3 to 1**

Conservation practices

Critical Area Planting
Fence
Firebreak
Livestock Pipeline
Pumping Plant
Rock Barrier
Access Road
Trails and Walkways
Watering Facility
Water Harvesting Catchment
Water Well
Upland Wildlife Habitat Management
Early Successional Habitat Development/Management
Controlled Livestock Lounging Area
Livestock Shade Structure
Snow Harvesting
Record Keeping
Well Plugging
Livestock Use Area Protection
Prescribed Grazing
TA Planning
TA Design

TA Application
TA Check-Out
Dust Control on Unpaved Roads and Surfaces
Road/Trail/Landing Closure and Treatment
Fish and Wildlife Structure
Fish and Wildlife Habitat Plan - Written
Fish and Wildlife Habitat Plan - Applied
Dust Control on Unpaved Roads and Surfaces

Transition T3A
State 3 to 4

Restoration pathway R4A
State 4 to 1

Conservation practices

Critical Area Planting
Fence
Firebreak
Access Control
Livestock Pipeline
Pumping Plant
Rock Barrier
Trails and Walkways
Watering Facility
Water Harvesting Catchment
Water Well
Upland Wildlife Habitat Management
Early Successional Habitat Development/Management
Controlled Livestock Lounging Area
Livestock Shade Structure
Snow Harvesting
Record Keeping
Well Plugging
Livestock Use Area Protection
Prescribed Grazing
TA Planning
TA Design
TA Application
TA Check-Out
Dust Control on Unpaved Roads and Surfaces
Road/Trail/Landing Closure and Treatment
Fish and Wildlife Structure

Fish and Wildlife Habitat Plan - Written
Fish and Wildlife Habitat Plan - Applied
Dust Control on Unpaved Roads and Surfaces

Restoration pathway R4B State 4 to 3

Conservation practices

Critical Area Planting
Water Well Decommissioning
Fence
Firebreak
Access Control
Livestock Pipeline
Pumping Plant
Rock Barrier
Trails and Walkways
Watering Facility
Water Harvesting Catchment
Water Well
Upland Wildlife Habitat Management
Early Successional Habitat Development/Management
Controlled Livestock Lounging Area
Livestock Shade Structure
Snow Harvesting
Well Plugging
Livestock Use Area Protection
Prescribed Grazing
TA Planning
TA Design
TA Application
TA Check-Out
Well Water Testing
Dust Control on Unpaved Roads and Surfaces
Road/Trail/Landing Closure and Treatment
Fish and Wildlife Structure
Grazing Management Plan - Written
Grazing Management Plan - Applied
Fish and Wildlife Habitat Plan - Written
Fish and Wildlife Habitat Plan - Applied
Dust Control on Unpaved Roads and Surfaces

**Transition T4A
State 4 to 5**

Additional community tables

Table 6. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Kg/Hectare)	Foliar Cover (%)
Grass/Grasslike					
1	Perennial Grasses			17–34	
	bush muhly	MUPO2	<i>Muhlenbergia porteri</i>	2–6	–
	whiplash pappusgrass	PAVA2	<i>Pappophorum vaginatum</i>	0–2	–
	big galleta	PLRI3	<i>Pleuraphis rigida</i>	0–2	–
	plains bristlegrass	SEVU2	<i>Setaria vulpisetata</i>	0–2	–
	sand dropseed	SPCR	<i>Sporobolus cryptandrus</i>	0–2	–
	slim tridens	TRMU	<i>Tridens muticus</i>	0–2	–
	purple threeawn	ARPU9	<i>Aristida purpurea</i>	0–2	–
	blue threeawn	ARPUN	<i>Aristida purpurea var. nealleyi</i>	0–2	–
	Parish's threeawn	ARPUP5	<i>Aristida purpurea var. parishii</i>	0–2	–
	Wright's threeawn	ARPUW	<i>Aristida purpurea var. wrightii</i>	0–2	–
	spidergrass	ARTE3	<i>Aristida ternipes</i>	0–2	–
	spidergrass	ARTEG	<i>Aristida ternipes var. gentilis</i>	0–2	–
	low woollygrass	DAPU7	<i>Dasyochloa pulchella</i>	0–2	–
	Arizona cottontop	DICA8	<i>Digitaria californica</i>	0–2	–
2	Annual Grasses			3–56	
	sixweeks threeawn	ARAD	<i>Aristida adscensionis</i>	0–11	–
	prairie threeawn	AROL	<i>Aristida oligantha</i>	0–11	–
	needle grama	BOAR	<i>Bouteloua aristidoides</i>	0–11	–
	Arizona signalgrass	URAR	<i>Urochloa arizonica</i>	0–8	–
	sixweeks fescue	VUOC	<i>Vulpia octoflora</i>	0–8	–
	Pacific fescue	VUMIP	<i>Vulpia microstachys var. pauciflora</i>	0–6	–
	sixweeks grama	BOBA2	<i>Bouteloua barbata</i>	0–6	–
	Rothrock's grama	BORO2	<i>Bouteloua rothrockii</i>	0–6	–
	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 var. miserrima</i>	0–1	–
	tufted lovegrass	ERPEP2	<i>Eragrostis pectinacea var. pectinacea</i>	0–1	–
	Mexican sprangletop	LEFUU	<i>Leptochloa fusca ssp. 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	–
	Eastwood fescue	VUMIC	<i>Vulpia microstachys var. ciliata</i>	0–1	–

Forb					
3	Perennial Forbs			39–56	
	evening primrose	OENOT	<i>Oenothera</i>	0–6	–
	desert globemallow	SPAM2	<i>Sphaeralcea ambigua</i>	0–6	–
	pricklyleaf dogweed	THAC	<i>Thymophylla acerosa</i>	0–1	–
	Tumamoc globeberry	TUMA	<i>Tumamoca macdougalii</i>	0–1	–
	dwarf desertpeony	ACNA2	<i>Acourtia nana</i>	0–1	–
	weakleaf bur ragweed	AMCO3	<i>Ambrosia confertiflora</i>	0–1	–
	southern Sierra pincushion	CHAL	<i>Chaenactis alpigena</i>	0–1	–
	whitemargin sandmat	CHAL11	<i>Chamaesyce albomarginata</i>	0–1	–
	shrubby deervetch	LORI3	<i>Lotus rigidus</i>	0–1	–
4	Annual Forbs			17–118	
	common fiddleneck	AMMEI2	<i>Amsinckia menziesii</i> var. <i>intermedia</i>	0–11	–
	bristly fiddleneck	AMTE3	<i>Amsinckia tessellata</i>	0–11	–
	desert Indianwheat	PLOV	<i>Plantago ovata</i>	0–11	–
	buckwheat	ERIOG	<i>Eriogonum</i>	0–11	–
	Coulter's globemallow	SPCO2	<i>Sphaeralcea coulteri</i>	0–6	–
	western tansymustard	DEPI	<i>Descurainia pinnata</i>	0–6	–
	cryptantha	CRYPT	<i>Cryptantha</i>	0–3	–
	hairy prairie clover	DAMO	<i>Dalea mollis</i>	0–1	–
	American wild carrot	DAPU3	<i>Daucus pusillus</i>	0–1	–
	carelessweed	AMPA	<i>Amaranthus palmeri</i>	0–1	–
	touristplant	DIWI2	<i>Dimorphocarpa wislizeni</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	–
	fringed amaranth	AMFI	<i>Amaranthus fimbriatus</i>	0–1	–
	milkvetch	ASTRA	<i>Astragalus</i>	0–1	–
	wheelscale saltbush	ATEL	<i>Atriplex elegans</i>	0–1	–
	wheelscale saltbush	ATELF	<i>Atriplex elegans</i> var. <i>fasciculata</i>	0–1	–
	Wright's saltbush	ATWR	<i>Atriplex wrightii</i>	0–1	–
	Coulter's spiderling	BOCO2	<i>Boerhavia coulteri</i>	0–1	–
	hoary bowlesia	BOIN3	<i>Bowlesia incana</i>	0–1	–
	exserted Indian paintbrush	CAEXE	<i>Castilleja exserta</i> ssp. <i>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	–
	aridland goosefoot	CHDE	<i>Chenopodium desiccatum</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	–
	sand pygmyweed	CRCO34	<i>Crassula connata</i>	0–1	–

	woollyhead neststraw	STMI2	<i>Stylocline micropoides</i>	0-1	-
	sand fringe pod	THCU	<i>Thysanocarpus curvipes</i>	0-1	-
	cutleaf thelypod	THLA	<i>Thelypodium laciniatum</i>	0-1	-
	woolly tidestromia	TILA2	<i>Tidestromia lanuginosa</i>	0-1	-
	doubleclaw	PRPA2	<i>Proboscidea parviflora</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	-
	common woolly sunflower	ERLA6	<i>Eriophyllum lanatum</i>	0-1	-
	Texas stork's bill	ERTE13	<i>Erodium texanum</i>	0-1	-
	California poppy	ESCAM	<i>Eschscholzia californica</i> ssp. <i>mexicana</i>	0-1	-
	pygmy poppy	ESMI	<i>Eschscholzia minutiflora</i>	0-1	-
	hairy desertsunflower	GECA2	<i>Geraea canescens</i>	0-1	-
	gilia	GILIA	<i>Gilia</i>	0-1	-
	Arizona poppy	KAGR	<i>Kallstroemia grandiflora</i>	0-1	-
	California goldfields	LACA7	<i>Lasthenia californica</i>	0-1	-
	Gordon's bladderpod	LEGO	<i>Lesquerella gordonii</i>	0-1	-
	shaggyfruit pepperweed	LELA	<i>Lepidium lasiocarpum</i>	0-1	-
	Bigelow's linanthus	LIBI2	<i>Linanthus bigelovii</i>	0-1	-
	coastal bird's-foot trefoil	LOSA	<i>Lotus salsuginosus</i>	0-1	-
	Arizona lupine	LUAR4	<i>Lupinus arizonicus</i>	0-1	-
	Coulter's lupine	LUSP2	<i>Lupinus sparsiflorus</i>	0-1	-
	disc mayweed	MADI6	<i>Matricaria discoidea</i>	0-1	-
	blazingstar	MENTZ	<i>Mentzelia</i>	0-1	-
	Nuttall's povertyweed	MONU	<i>Monolepis nuttalliana</i>	0-1	-
	bristly nama	NAHI	<i>Nama hispidum</i>	0-1	-
	glandular threadplant	NEGL	<i>Nemacladus glanduliferus</i>	0-1	-
	lineleaf whitepuff	OLLI	<i>Oligomeris linifolia</i>	0-1	-
	Florida pellitory	PAFL3	<i>Parietaria floridana</i>	0-1	-
	combseed	PECTO	<i>Pectocarya</i>	0-1	-
	manybristle chinchweed	PEPA2	<i>Pectis papposa</i>	0-1	-
	phacelia	PHACE	<i>Phacelia</i>	0-1	-

Shrub/Vine

5	Dominant Shrubs			118-235	
	creosote bush	LATR2	<i>Larrea tridentata</i>	118-235	-
6	Dominant Half-Shrubs			39-78	
	burrobush	AMDU2	<i>Ambrosia dumosa</i>	11-28	-
	triangle bur ragweed	AMDE4	<i>Ambrosia deltoidea</i>	11-22	-
	white ratany	KRGR	<i>Krameria grayi</i>	6-17	-
	littleleaf ratany	KRER	<i>Krameria erecta</i>	6-11	-
7	Miscellaneous Shrubs			3-8	
	whitethorn acacia	ACCO2	<i>Acacia constricta</i>	0-1	-

	cattle saltbush	ATPO	<i>Atriplex polycarpa</i>	0-1	-
	crucifixion thorn	CAEM4	<i>Castela emoryi</i>	0-1	-
	ocotillo	FOSP2	<i>Fouquieria splendens</i>	0-1	-
	crown of thorns	KOSP	<i>Koeberlinia spinosa</i>	0-1	-
	water jacket	LYAN	<i>Lycium andersonii</i>	0-1	-
	Berlandier's wolfberry	LYBE	<i>Lycium berlandieri</i>	0-1	-
	Arizona desert-thorn	LYEX	<i>Lycium exsertum</i>	0-1	-
	desert ironwood	OLTE	<i>Olneya tesota</i>	0-1	-
	yellow paloverde	PAMI5	<i>Parkinsonia microphylla</i>	0-1	-
	velvet mesquite	PRVE	<i>Prosopis velutina</i>	0-1	-
	whitestem paperflower	PSCO2	<i>Psilostrophe cooperi</i>	0-1	-
	lotebush	ZIOB	<i>Ziziphus obtusifolia</i>	0-1	-
8	Succulents			3-11	
	candy barrelcactus	FEWI	<i>Ferocactus wislizeni</i>	0-1	-
	beavertail pricklypear	OPBA2	<i>Opuntia basilaris</i>	0-1	-
	nightblooming cereus	PEGR3	<i>Peniocereus greggii</i>	0-1	-

Animal community

This site produces no herbaceous forage for year round use. Shrubby species on the site are not palatable. In wet winters the production of cool season annuals can be very high and provide for a high carrying capacity of stocker cattle in the March-May grazing season.

Water developments will help some species of wildlife on this site. Cover, forage and diversity are lacking for the large desert mammals. This site is home to a variety of small burrowing mammals, reptiles and their predators.

Other information

T&E: *Antilocapra Americana sonoriensis*
(Sonoran pronghorn)
Tumamoca *Macdougalii*
(Tumamoc globe berry)
Leptonycteris curasoa yerbebuena
(Lesser long-nosed bat)

Type locality

Location 1: Pima County, AZ	
Township/Range/Section	T10S R5E S26
General legal description	Sells FO - Sif Oidak Dist., Tat Momoli Valley
Location 2: Pima County, AZ	
Township/Range/Section	T14S R6W S20
General legal description	Tucson FO - Organ Pipe National Monument
Location 3: Maricopa County, AZ	
Township/Range/Section	T1S R7E S14
General legal description	Chandler FO - General Motors Proving Grounds

Contributors

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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, Byron Lambeth, Dan Robinett, Emilio Carrillo
Contact for lead author	NRCS Tucson Area Office
Date	03/02/2005
Approved by	S. Cassady
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.

- 2. Presence of water flow patterns:** Water flow patterns are common, continuous and occupy 15-20% of area.

- 3. Number and height of erosional pedestals or terracettes:** Accumulated pedestals on most perennial plants, not so much so in high gravel cover areas., 2-5 inches high. There are no pedestals on rock or gravel fragments and no terracettes are present.

- 4. Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):** 10-60% (low values in high gravel cover areas and/or 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):** thin platy to weak granular; color is 7.5-10YR6/4 dry, 7.5-10YR4/4 moist, thickness to 3 inches.
-
10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:** cover estimated as: Canopy 10-15%; 65% shrubs, 5% trees and 30% succulents. Cover is well 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
-
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 > subshrubs > trees > succulents > forbs = perennial grasses (Note: in El Nino years annual forbs and grasses are #1 in above ground weight)
- Sub-dominant:
- Other:
- Additional:
-
13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):** 0-50% canopy mortality. Some areas have 70-80% canopy mortality.
-
14. **Average percent litter cover (%) and depth (in):**
-
15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):** 200 lbs/ac unfavorable precipitation, 350 lbs/ac normal precipitation, 700 lbs/ac 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:** Sahara mustard, schismus, filaree
-
17. **Perennial plant reproductive capability:** Not impaired for shrubs, drought impaired for perennial grasses and forbs.
