

Ecological site R041XA105AZ

Limy Upland 16-20" p.z.

Last updated: 4/09/2021
 Accessed: 05/07/2024

General information

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

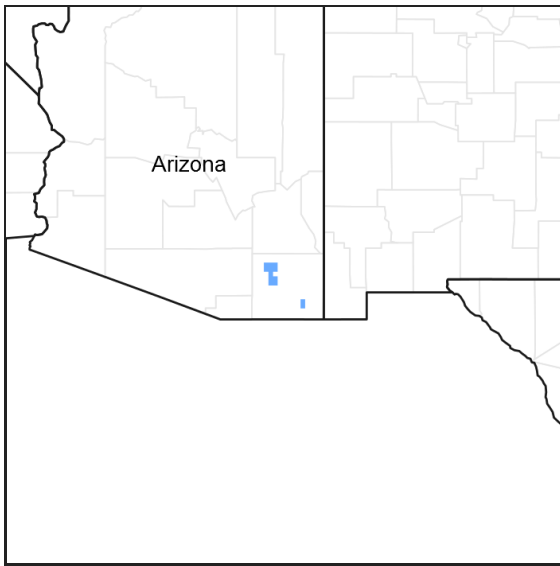


Figure 1. Mapped extent

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

MLRA notes

Major Land Resource Area (MLRA): 041X–Madrean Archipelago

AZ 41.1 – Mexican Oak-Pine Forest and Oak Savannah

Elevations range from 4500 to 10,700 feet and precipitation ranges from 16 to 30 inches. Vegetation includes Emory oak, Mexican blue oak, Arizona white oak, one-seed juniper, alligator juniper, sacahuista, California bricklebrush, skunkbush sumac, Arizona rosewood, wait-a-bit mimosa, sideoats grama, blue grama, purple grama, wooly bunchgrass, plains lovegrass, squirreltail, and pinyon ricegrass. The soil temperature regime ranges from thermic to mesic and the soil moisture regime ranges from aridic ustic to typic ustic. 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

R041XA103AZ	Limestone Hills 16-20 p.z.
R041XA107AZ	Loamy Slopes 16-20" p.z.
R041XA108AZ	Loamy Upland 16-20" p.z.

R041XA114AZ	Loamy Bottom 16-20" p.z.
R041XA115AZ	Loamy Swale 16-20" p.z.

Similar sites

R041XC309AZ	Limy Upland 12-16" p.z.
R041XA103AZ	Limestone Hills 16-20 p.z.
R041XC308AZ	Limy Slopes 12-16" p.z.
R041XA104AZ	Limy Slopes 16-20" p.z.

Table 1. Dominant plant species

Tree	Not specified
Shrub	(1) <i>krameria erecta</i> (2) <i>nolina microcarpa</i>
Herbaceous	(1) <i>bouteloua eriopoda</i> (2) <i>aristida purpurea var. nealleyi</i>

Physiographic features

This site occurs in the middle elevations of the Madrean Basin and Range province in southeastern Arizona. It occurs on ridge-tops and fan terraces.

Table 2. Representative physiographic features

Landforms	(1) Ballena (2) Ridge (3) Fan piedmont
Flooding frequency	None
Ponding frequency	None
Elevation	1,433–1,676 m
Slope	1–15%
Aspect	Aspect is not a significant factor

Climatic features

Precipitation in this zone of the common resource area ranges from 16-20 inches per year with elevations from 4700-5500 feet. Approximately 40% of this moisture comes as gentle rain or snow during the winter-spring (Oct-Apr) season; originates in the north Pacific and Gulf of California and comes as frontal storms with long duration and low intensity. The remaining 60% falls in the summer season (May-Sep); originates in the Gulf of Mexico and are convective, usually brief, intense thunderstorms. Snow is common Dec-Mar, averaging 5-15 inches per year, but rarely lasts more than a week. May and June are the driest months. Humidity is low.

Temperatures are mild. Freezing temperatures are common at night from Oct-May, but daytime temperatures are almost always over 40 F. Below 0 F temperatures can occur Dec-Feb. Daytime summer highs rarely exceed 95 F.

Species like New Mexico feathergrass, wooly bunchgrass, false mesquite, shrubby dalea and ratany begin growth in late March to April. Warm season grasses begin growth in July or August with receipt of the first summer rains.

Table 3. Representative climatic features

Frost-free period (average)	200 days
Freeze-free period (average)	

Precipitation total (average)	508 mm
-------------------------------	--------

Influencing water features

There are no water features associated with this site.

Soil features

These soils have developed on calcareous alluvium or conglomerate and fanglomerate. They are shallow to lime cemented pans and are calcareous throughout. Soil surfaces range in texture from very cobbly sandy loam to very gravelly loam. The surface soil is dark colored. Soil surfaces are well protected by covers of rocks, cobbles, and/or gravels. Plant soil moisture relationships are poor to fair.

Soils mapped on this site include:SSA-666 Cochise Northwestern part MU 16 Carbine; SSA-671 Cochise county Douglas-Tombstone part MU 43 Denab.

Table 4. Representative soil features

Parent material	(1) Alluvium–conglomerate
Surface texture	(1) Very gravelly sandy loam (2) Very gravelly loam (3) Cobbly sandy loam
Family particle size	(1) Loamy
Drainage class	Well drained
Permeability class	Moderately rapid to moderate
Soil depth	25–51 cm
Surface fragment cover ≤3"	20–55%
Surface fragment cover >3"	0–5%
Available water capacity (0-101.6cm)	2.03–5.08 cm
Calcium carbonate equivalent (0-101.6cm)	5–30%
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)	7.8–8.4
Subsurface fragment volume ≤3" (Depth not specified)	10–45%
Subsurface fragment volume >3" (Depth not specified)	0–5%

Ecological dynamics

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

Production data provided in this site description is standardized to air dry weight at the end of the summer growing

season. The plant communities described in this site description are based on near normal rainfall years.

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

State and transition model

41.1 Limy Upland 16-20" p.z. (R041XA105AZ)

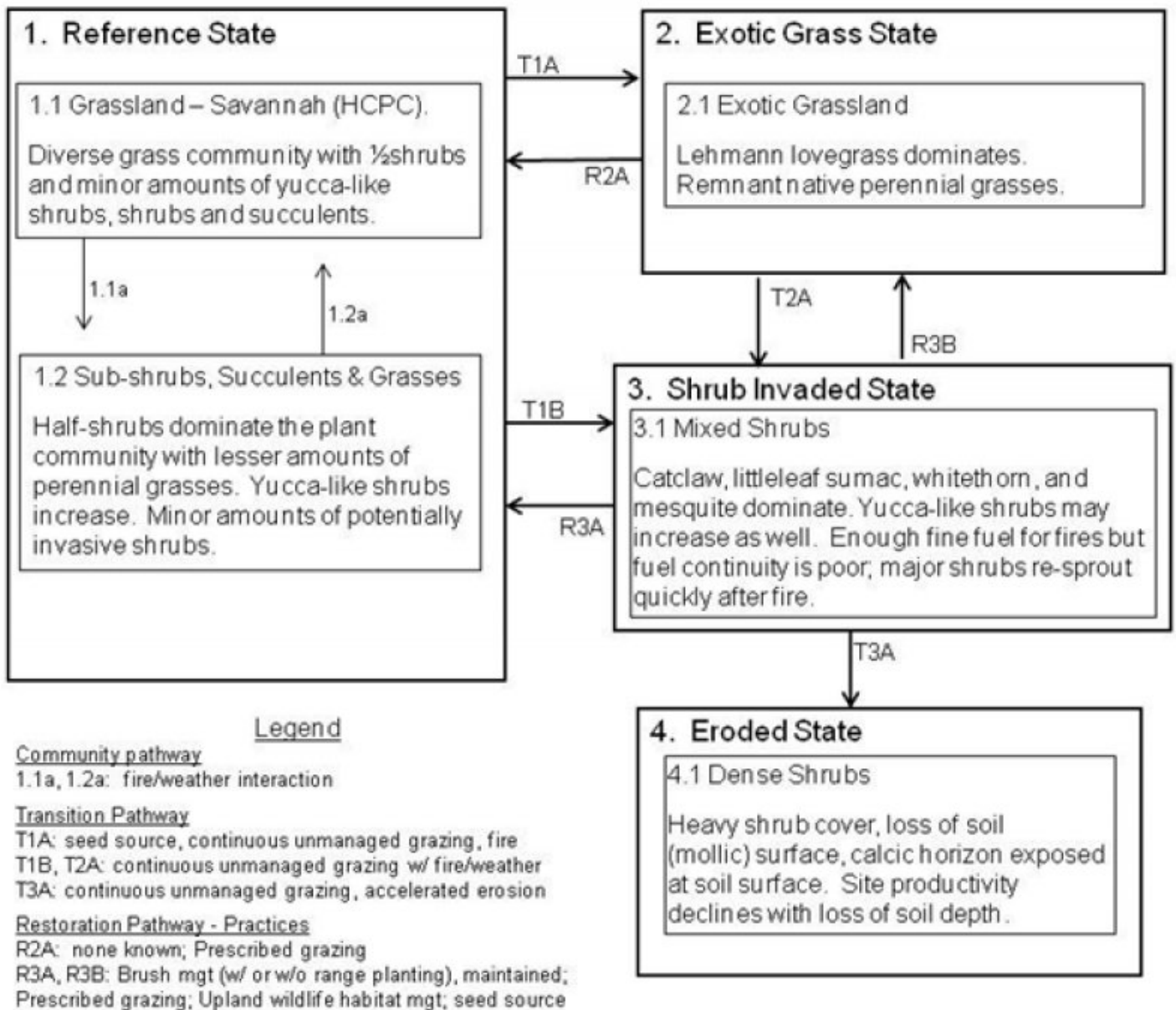


Figure 4. 41-1 Limy Upland STM

State 1 Reference

Community 1.1 Grassland - Savannah (HCPC)



Figure 5. Limy Upland 16-20" pz. HCPC

The historic native state includes the native plant communities that occur on the site, including the historic climax plant community. This state includes other plant communities that naturally occupy the site following fire, drought, flooding, herbivores, and other natural disturbances. The historic climax plant community represents the natural climax community that eventually reoccupies the site with proper management. The list of plants and their relative proportions are based on near normal years. Fluctuations in species composition and relative production may change from year to year dependant upon abnormal precipitation or other climatic factors. The potential plant community has been determined by a study of range relict areas, or areas protected from excessive grasses. Trends in plant communities going from heavily grazed to lightly grazed, seasonal-use pasture and historical accounts have also been used. The potential plant community on this site is dominated by warm season perennial grasses with a fair component of cool season perennial grasses and half shrubs. Cool season grasses tend to be clumped on the site and not evenly dispersed in the community. Several species of shrubs, cacti, other succulents and forbs are represented in the plant community. The aspect is open grassland to savannah. With continuous heavy grazing, cool season grasses and warm season mid-grasses are removed from the plant community and replaced by unpalatable species like fluffgrass and blue threeawn. With severe deterioration, shrubby species like wait-a-bit mimosa, one-seed juniper and littleleaf sumac can increase to dominate the site. Mesquite, whitethorn acacia and Lehmann lovegrass can invade the community on this site and increase to dominate. Naturally occurring fires in June-August are an important factor in shaping this plant community. Fire-free intervals range from 10-20 years. Without periodic disturbance, like grazing or fire, perennial mid-grasses can become decadent and forbs like croton, bahia and ragweed can increase to dominate the plant community. This site is one of the principle habitats for beargrass in this LRA. Extensive stands are utilized by Mexican industries in making brooms, mats and baskets. To a lesser degree, they are used by native Americans in basket making. Plants should not be harvested more than once every three years to allow adequate recovery and seed production. Periodic drought can occur in this LRA and cause significant grass mortality. Droughts in the early 30s, mid-50s, 1975-76, 1988-89, 95-96 and 2002 resulted in the loss of much of the grass cover on this site. The site recovers rapidly, however, due to covers of gravel and cobble and the good climate prevailing in this LRA.

Table 5. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Grass/Grasslike	291	673	953
Shrub/Vine	45	112	235
Forb	7	17	50
Tree	–	6	22
Total	343	808	1260

Table 6. Soil surface cover

Tree basal cover	0%
------------------	----

Shrub/vine/liana basal cover	1-5%
Grass/grasslike basal cover	4-12%
Forb basal cover	0-1%
Non-vascular plants	0%
Biological crusts	1-5%
Litter	10-40%
Surface fragments >0.25" and <=3"	15-55%
Surface fragments >3"	0-5%
Bedrock	0-5%
Water	0%
Bare ground	5-20%

Table 7. Canopy structure (% cover)

Height Above Ground (M)	Tree	Shrub/Vine	Grass/ Grasslike	Forb
<0.15	–	0-5%	1-5%	0-2%
>0.15 <= 0.3	–	1-10%	10-15%	1-5%
>0.3 <= 0.6	–	1-5%	10-20%	0-1%
>0.6 <= 1.4	–	1-5%	0-5%	–
>1.4 <= 4	0-1%	0-2%	–	–
>4 <= 12	0-1%	–	–	–
>12 <= 24	–	–	–	–
>24 <= 37	–	–	–	–
>37	–	–	–	–

Figure 7. Plant community growth curve (percent production by month). AZ4111, 41.1 16-30. Growth begins in the spring, semi-dormancy occurs during the June drought, most growth occurs during the summer rainy season..

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	0	0	5	10	0	15	45	20	5	0	0

Community 1.2 Sub-shrubs, Succulents & Grasses

Half-shrubs dominate the plant community with lesser amounts of perennial grasses. Yucca-like shrubs increase. Minor amounts of potentially invasive shrubs such as sumac and mimosa.

Pathway 1.1a Community 1.1 to 1.2

Drought, no grazing, no burning.

Conservation practices

Prescribed Burning
Upland Wildlife Habitat Management
Prescribed Grazing

Pathway 1.2a
Community 1.2 to 1.1

Natural fire, prescribed grazing, prescribed burning.

Conservation practices

Prescribed Burning
Upland Wildlife Habitat Management
Prescribed Grazing

State 2
Exotic grass

Community 2.1
Exotic grass



Figure 8. Limy Upland 16-20" pz. Lehmann lovegrass

This state occurs where Lehmann lovegrass has either been seeded or has invaded the plant community from a nearby seed source. Lehmann can increase to dominate the plant community. Native perennial grasses and forbs are reduced to minor amounts. Repeated fires will usually result in increased dominance of Lehmann lovegrass.

State 3
Shrub invaded

Community 3.1
Shrub invaded



Figure 9. Limy Upland 16-20" pz. Shrub invasion

This state occurs where shrubs like catclaw mimosa, littleleaf sumac, whitethorn acacia and mesquite increase in the absence of fire for long periods of time. Yucca like shrubs including sotol, beargrass, soapweed and banana yucca can also increase. Sufficient fine fuels may still exist to carry fire but fuel continuity is poor and large areas will not burn. The major shrubs are well established and will re-sprout after fire and quickly assume dominance.

**State 4
Eroded**

**Community 4.1
Eroded**

This state exists where accelerated sheet and rill erosion has occurred due severe trailing and soil compaction. In some areas road construction has resulted in this condition. The dark colored soil surface horizon is lost and eroded to expose cemented lime pans at the surface. Site productivity declines as soil depth decreases.

**Transition T1A
State 1 to 2**

Non-native bunchgrass seed source (wind-blown or mechanical transport) paired with native perennial grass community disturbance such as fire or unmanaged grazing.

**Transition T1B
State 1 to 3**

Long-term unmanaged grazing with or without drought/fire interaction opens perennial grass canopy allowing shrubs to outcompete resources. Juniper, mimosa and other shrubs are likely to increase as well as yucca-like succulents. Remnant native perennial grasses cannot re-colonize areas with shrub competition.

**Restoration pathway R2A
State 2 to 1**

No restoration pathway known at this time. Perhaps future development of herbicide or biological treatment to remove perennial exotics will occur.

Conservation practices

Upland Wildlife Habitat Management
Prescribed Grazing

Transition T2A

State 2 to 3

Long-term unmanaged grazing with or without drought/fire interaction opens perennial grass canopy allowing shrubs to outcompete resources. Juniper, mimosa and other shrubs are likely to increase as well as yucca-like succulents. Remnant native perennial grasses cannot re-colonize areas with shrub competition.

Restoration pathway R3A

State 3 to 1

Woody species management, native species planting (as needed), supported by prescribed grazing. Shrub control maintained with herbicide and/or prescribed burning.

Conservation practices

Brush Management
Prescribed Burning
Upland Wildlife Habitat Management
Prescribed Grazing

Restoration pathway R3B

State 3 to 2

Restoration practices conducted when a non-native seed bank is present on site (Lehmann lovegrass or other non-natives present along trails, roads or in disturbed areas) can result in an exotic grassland community. Native species seeding may enhance the native grass and forb components. Practices are woody species control, native species seeding(as needed) both supported by managed grazing. Shrub control maintained with herbicide will favor the native grasses while prescribed burning favors non-natives. Burning the mixed shrub community with a non-native grass seed source present can result in an exotic grassland co-dominant with shrubs.

Conservation practices

Brush Management
Prescribed Burning
Range Planting
Upland Wildlife Habitat Management
Prescribed Grazing

Transition T3A

State 3 to 4

Long-term unmanaged grazing affects soil site stability and hydrologic functioning. Animal trailing and soil surface compaction compound the affect of plant community changes (increased shrub/decreased perennial grass community) to increase surface water run-off rather than infiltration. Over time (50-100+ years) the mollic A horizon can be lost leaving the site with a reduction in potential productivity.

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	Dominant mid grasses			112–448	
	sideoats grama	BOCU	<i>Bouteloua curtipendula</i>	112–336	–
	woolyspike belemnite	ELBA	<i>Elionurus barbiculmis</i>	0–112	–

	BasinScale				
	spiked crinkleawn	TRSP12	<i>Trachypogon spicatus</i>	0-112	-
2	Dominant cool season grasses			11-112	
	southwestern needlegrass	ACEM4	<i>Achnatherum eminens</i>	6-112	-
	New Mexico feathergrass	HENE5	<i>Hesperostipa neomexicana</i>	6-112	-
	prairie Junegrass	KOMA	<i>Koeleria macrantha</i>	0-11	-
	pinyon ricegrass	PIFI	<i>Piptochaetium fimbriatum</i>	0-11	-
	squirreltail	ELELE	<i>Elymus elymoides ssp. elymoides</i>	0-6	-
3	Dominant short grasses			168-336	
	black grama	BOER4	<i>Bouteloua eriopoda</i>	112-224	-
	blue threeawn	ARPUN	<i>Aristida purpurea var. nealleyi</i>	22-112	-
	low woollygrass	DAPU7	<i>Dasyochloa pulchella</i>	6-56	-
	Hall's panicgrass	PAHA	<i>Panicum hallii</i>	6-56	-
	slim tridens	TRMU	<i>Tridens muticus</i>	6-56	-
	hairy grama	BOHI2	<i>Bouteloua hirsuta</i>	0-28	-
	shortleaf woollygrass	ERAV	<i>Erioneuron avenaceum</i>	0-22	-
4	Miscellaneous perennial grasses			0-34	
	spidergrass	ARTE3	<i>Aristida ternipes</i>	0-11	-
	spidergrass	ARTEG	<i>Aristida ternipes var. gentilis</i>	0-6	-
	poverty threeawn	ARDI5	<i>Aristida divaricata</i>	0-6	-
	Fendler threeawn	ARPUL	<i>Aristida purpurea var. longiseta</i>	0-6	-
	Wright's threeawn	ARPUW	<i>Aristida purpurea var. wrightii</i>	0-6	-
	Orcutt's threeawn	ARSCO	<i>Aristida schiedeana var. orcuttiana</i>	0-6	-
	plains lovegrass	ERIN	<i>Eragrostis intermedia</i>	0-6	-
	tanglehead	HECO10	<i>Heteropogon contortus</i>	0-6	-
	sand dropseed	SPCR	<i>Sporobolus cryptandrus</i>	0-6	-
	slim tridens	TRMUE	<i>Tridens muticus var. elongatus</i>	0-2	-
	common wolfstail	LYPH	<i>Lycurus phleoides</i>	0-2	-
	bullgrass	MUEM	<i>Muhlenbergia emersleyi</i>	0-2	-
	desert muhly	MUGL2	<i>Muhlenbergia glauca</i>	0-2	-
	bush muhly	MUPO2	<i>Muhlenbergia porteri</i>	0-2	-
	fall witchgrass	DICO6	<i>Digitaria cognata</i>	0-2	-
	slender muhly	MUTE4	<i>Muhlenbergia tenuifolia</i>	0-2	-
	plains bristlegrass	SEVU2	<i>Setaria vulpiseta</i>	0-2	-
	cane bluestem	BOBA3	<i>Bothriochloa barbinodis</i>	0-2	-
	blue grama	BOGR2	<i>Bouteloua gracilis</i>	0-2	-
	purple grama	BORA	<i>Bouteloua radicata</i>	0-1	-
	slender grama	BORE2	<i>Bouteloua repens</i>	0-1	-
	Rothrock's grama	BORO2	<i>Bouteloua rothrockii</i>	0-1	-
	silver bluestem	BOSA	<i>Bothriochloa saccharoides</i>	0-1	-
	sedge	CAREX	<i>Carex</i>	0-1	-
	flatsedge	CYPER	<i>Cyperus</i>	0-1	-
	Arizona cottontop	DICA8	<i>Digitaria californica</i>	0-1	-

	vine mesquite	PAOB	<i>Panicum obtusum</i>	0-1	-
	Texas bluestem	SCCI2	<i>Schizachyrium cirratum</i>	0-1	-
	nineawn pappusgrass	ENDE	<i>Enneapogon desvauxii</i>	0-1	-
	purple muhly	MURI3	<i>Muhlenbergia rigida</i>	0-1	-
	curly-mesquite	HIBE	<i>Hilaria belangeri</i>	0-1	-
	green sprangletop	LEDU	<i>Leptochloa dubia</i>	0-1	-
5	Annual grasses			0-22	
	sixweeks threeawn	ARAD	<i>Aristida adscensionis</i>	0-6	-
	prairie threeawn	AROL	<i>Aristida oligantha</i>	0-6	-
	Mexican sprangletop	LEFUU	<i>Leptochloa fusca ssp. uninervia</i>	0-6	-
	mucronate sprangletop	LEPAB	<i>Leptochloa panicea ssp. brachiata</i>	0-6	-
	witchgrass	PACA6	<i>Panicum capillare</i>	0-6	-
	Mexican panicgrass	PAHI5	<i>Panicum hirticaule</i>	0-6	-
	Arizona signalgrass	URAR	<i>Urochloa arizonica</i>	0-2	-
	delicate muhly	MUFR	<i>Muhlenbergia fragilis</i>	0-2	-
	littleseed muhly	MUMI	<i>Muhlenbergia microsperma</i>	0-2	-
	sixweeks fescue	VUOC	<i>Vulpia octoflora</i>	0-2	-
	Eastwood fescue	VUMIC	<i>Vulpia microstachys var. ciliata</i>	0-1	-
	desert fescue	VUMIM	<i>Vulpia microstachys var. microstachys</i>	0-1	-
	poverty dropseed	SPVA	<i>Sporobolus vaginiflorus</i>	0-1	-
	prairie false oat	TRIN5	<i>Trisetum interruptum</i>	0-1	-
	needle grama	BOAR	<i>Bouteloua aristidoides</i>	0-1	-
	sixweeks grama	BOBA2	<i>Bouteloua barbata</i>	0-1	-
	matted grama	BOSI2	<i>Bouteloua simplex</i>	0-1	-
	Arizona brome	BRAR4	<i>Bromus arizonicus</i>	0-1	-
	feather fingergrass	CHVI4	<i>Chloris virgata</i>	0-1	-
	tapertip cupgrass	ERACA	<i>Eriochloa acuminata var. acuminata</i>	0-1	-
	Mexican lovegrass	ERME	<i>Eragrostis mexicana</i>	0-1	-
	tufted lovegrass	ERPEP2	<i>Eragrostis pectinacea var. pectinacea</i>	0-1	-
	pitscale grass	HAGR3	<i>Hackelochloa granularis</i>	0-1	-
Forb					
6	Perennial forbs			6-28	
	trailing windmills	ALIN	<i>Allionia incarnata</i>	1-6	-
	leatherweed	CRPO5	<i>Croton pottsii</i>	1-6	-
	bluedicks	DICA14	<i>Dichelostemma capitatum</i>	1-6	-
	spreading snakeherb	DYSCD	<i>Dyschoriste schiedeana var. decumbens</i>	0-2	-
	shrubby purslane	POSU3	<i>Portulaca suffrutescens</i>	0-2	-
	slimflower scurfpea	PSTE5	<i>Psoralidium tenuiflorum</i>	0-2	-
	Rocky Mountain zinnia	ZIGR	<i>Zinnia grandiflora</i>	0-2	-
	Texas snoutbean	RHSET	<i>Rhynchosia senna var. texana</i>	0-2	-
	brownplume wirelettuce	STPA4	<i>Stephanomeria pauciflora</i>	0-2	-
	shrubby copperleaf	ACPH3	<i>Acalypha phleoides</i>	0-2	-
	bastard toadflax	COUM	<i>Comandra umbellata</i>	0-2	-

pitseed goosefoot	CHBE4	<i>Chenopodium berlandieri</i>	0-2	-
rose heath	CHER2	<i>Chaetopappa ericoides</i>	0-2	-
tuber anemone	ANTU	<i>Anemone tuberosa</i>	0-2	-
weakeaf bur ragweed	AMCO3	<i>Ambrosia confertiflora</i>	1-2	-
white sagebrush	ARLU	<i>Artemisia ludoviciana</i>	0-2	-
spreading fleabane	ERDI4	<i>Erigeron divergens</i>	0-2	-
trailing fleabane	ERFL	<i>Erigeron flagellaris</i>	0-2	-
fineleaf hymenopappus	HYFI	<i>Hymenopappus filifolius</i>	0-2	-
purplenerve springparsley	CYMU2	<i>Cymopterus multinervatus</i>	0-2	-
Wright's deervetch	LOWR	<i>Lotus wrightii</i>	0-2	-
tufted evening primrose	OECA10	<i>Oenothera caespitosa</i>	0-2	-
Cooley's bundleflower	DECO2	<i>Desmanthus cooleyi</i>	0-2	-
locoweed	OXYTR	<i>Oxytropis</i>	0-1	-
beardlip penstemon	PEBA2	<i>Penstemon barbatus</i>	0-1	-
Cochise beardtongue	PEDA	<i>Penstemon dasyphyllus</i>	0-1	-
longstalk chinchweed	PELO	<i>Pectis longipes</i>	0-1	-
Parry's beardtongue	PEPA24	<i>Penstemon parryi</i>	0-1	-
slimleaf bean	PHAN3	<i>Phaseolus angustissimus</i>	0-1	-
orange fameflower	PHAU13	<i>Phemeranthus aurantiacus</i>	0-1	-
ivyleaf groundcherry	PHHE4	<i>Physalis hederifolia</i>	0-1	-
white milkwort	POAL4	<i>Polygala alba</i>	0-1	-
velvetseed milkwort	POOB	<i>Polygala obscura</i>	0-1	-
variableleaf bushbean	MAGI2	<i>Macroptilium gibbosifolium</i>	0-1	-
lacy tansyaster	MAPI	<i>Machaeranthera pinnatifida</i>	0-1	-
Mexican star	MIBI2	<i>Milla biflora</i>	0-1	-
lemon beebalm	MOCIA	<i>Monarda citriodora ssp. austromontana</i>	0-1	-
whiteflower prairie clover	DAAL	<i>Dalea albiflora</i>	0-1	-
James' prairie clover	DAJA	<i>Dalea jamesii</i>	0-1	-
dwarf prairie clover	DANA	<i>Dalea nana</i>	0-1	-
downy prairie clover	DANE	<i>Dalea neomexicana</i>	0-1	-
babyslippers	HYVE	<i>Hybanthus verticillatus</i>	0-1	-
ragged nettlespurge	JAMA	<i>Jatropha macrorhiza</i>	0-1	-
San Pedro daisy	LAP04	<i>Lasianthaea podocephala</i>	0-1	-
Fendler's bladderpod	LEFE	<i>Lesquerella fendleri</i>	0-1	-
narrowleaf stoneseed	LIIN2	<i>Lithospermum incisum</i>	0-1	-
Lewis flax	LILE3	<i>Linum lewisii</i>	0-1	-
Greene's bird's-foot trefoil	LOGR4	<i>Lotus greenei</i>	0-1	-
Mexican fireplant	EUHE4	<i>Euphorbia heterophylla</i>	0-1	-
sun spurge	EUR2	<i>Euphorbia radians</i>	0-1	-
wild dwarf morning- glory	EVAR	<i>Evolvulus arizonicus</i>	0-1	-
shaggy dwarf morning-	EVNU	<i>Evolvulus nuttallianus</i>	0-1	-

	glory				
	silver dwarf morning-glory	EVSE	<i>Evolvulus sericeus</i>	0-1	-
	Arizona snakecotton	FRAR2	<i>Froelichia arizonica</i>	0-1	-
	scarlet beeblossom	GACO5	<i>Gaura coccinea</i>	0-1	-
	pearly globe amaranth	GONI	<i>Gomphrena nitida</i>	0-1	-
	small matweed	GUDE	<i>Guilleminea densa</i>	0-1	-
	red bluet	HORU	<i>Houstonia rubra</i>	0-1	-
	perennial rockcress	ARPE2	<i>Arabis perennans</i>	0-1	-
	southwestern pricklypoppy	ARPL3	<i>Argemone pleiacantha</i>	0-1	-
	Watson's dutchman's pipe	ARWA	<i>Aristolochia watsonii</i>	0-1	-
	Arizona milkvetch	ASAR6	<i>Astragalus arizonicus</i>	0-1	-
	spider milkweed	ASAS	<i>Asclepias asperula</i>	0-1	-
	chaparral asphed	ASHI3	<i>Aspicarpa hirtella</i>	0-1	-
	broadleaf milkweed	ASLA4	<i>Asclepias latifolia</i>	0-1	-
	woolly locoweed	ASMOB	<i>Astragalus mollissimus var. bigelovii</i>	0-1	-
	sheep milkvetch	ASNO3	<i>Astragalus nothoxys</i>	0-1	-
	horsetail milkweed	ASSU2	<i>Asclepias subverticillata</i>	0-1	-
	dense ayenia	AYMI	<i>Ayenia microphylla</i>	0-1	-
	hairyseed bahia	BAAB	<i>Bahia absinthifolia</i>	0-1	-
	lyreleaf greeneyes	BELY	<i>Berlandiera lyrata</i>	0-1	-
	scarlet spiderling	BOCO	<i>Boerhavia coccinea</i>	0-1	-
	dwarf stickpea	CAHUR	<i>Calliandra humilis var. reticulata</i>	0-1	-
	wholeleaf Indian paintbrush	CAIN14	<i>Castilleja integra</i>	0-1	-
	desert mariposa lily	CAKE	<i>Calochortus kennedyi</i>	0-1	-
	sego lily	CANU3	<i>Calochortus nuttallii</i>	0-1	-
	Indian paintbrush	CASTI2	<i>Castilleja</i>	0-1	-
	whitemargin sandmat	CHAL11	<i>Chamaesyce albomarginata</i>	0-1	-
	Mexican yellowshow	AMPA3	<i>Amoreuxia palmatifida</i>	0-1	-
	Cuman ragweed	AMPS	<i>Ambrosia psilostachya</i>	0-1	-
	crested anoda	ANCR2	<i>Anoda cristata</i>	0-1	-
	melon loco	APUN	<i>Apodanthera undulata</i>	0-1	-
	largeflower onion	ALMA4	<i>Allium macropetalum</i>	0-1	-
	birdbill dayflower	CODI4	<i>Commelina dianthifolia</i>	0-1	-
	Texas bindweed	COEQ	<i>Convolvulus equitans</i>	0-1	-
	whitemouth dayflower	COER	<i>Commelina erecta</i>	0-1	-
	fingerleaf gourd	CUDI	<i>Cucurbita digitata</i>	0-1	-
	coyote gourd	CUPA	<i>Cucurbita palmata</i>	0-1	-
	jewels of Opar	TAPA2	<i>Talinum paniculatum</i>	0-1	-
	Coulter's wrinklefruit	TECO	<i>Tetraclea coulteri</i>	0-1	-
	hairy fourwort	TENE	<i>Tetramerium nervosum</i>	0-1	-
	longstalk greenthread	THLO	<i>Thelesperma longipes</i>	0-1	-
	Hopi tea greenthread	THME	<i>Thelesperma macrostachyum</i>	0-1	-

	hopi tea greenbriar	TRME	<i>Thesperma megapotamicum</i>	0-1	-
	pinewoods spiderwort	TRPI	<i>Tradescantia pinetorum</i>	0-1	-
	branched noseburn	TRRA5	<i>Tragia ramosa</i>	0-1	-
	Fort Huachuca vervain	VEGR2	<i>Verbena gracilis</i>	0-1	-
	American vetch	VIAM	<i>Vicia americana</i>	0-1	-
	Louisiana vetch	VILUL2	<i>Vicia ludoviciana ssp. ludoviciana</i>	0-1	-
	copper zephyrlily	ZELO	<i>Zephyranthes longifolia</i>	0-1	-
	slimleaf plainsmustard	SCLI12	<i>Schoenocrambe linearifolia</i>	0-1	-
	twingleaf senna	SEBA3	<i>Senna bauhinioides</i>	0-1	-
	Lemmon's ragwort	SELE8	<i>Senecio lemmonii</i>	0-1	-
	salt spring checkerbloom	SINE3	<i>Sidalcea neomexicana</i>	0-1	-
	silverleaf nightshade	SOEL	<i>Solanum elaeagnifolium</i>	0-1	-
	copper globemallow	SPAN3	<i>Sphaeralcea angustifolia</i>	0-1	-
	gooseberryleaf globemallow	SPGR2	<i>Sphaeralcea grossularifolia</i>	0-1	-
	buffpetal	RHPH2	<i>Rhynchosida physocalyx</i>	0-1	-
	Torrey's craglily	ECFL	<i>Echeandia flavescens</i>	0-1	-
7	Annual Forbs			1-22	
	longleaf false goldeneye	HELOA2	<i>Heliomeris longifolia var. annua</i>	0-6	-
	woolly plantain	PLPA2	<i>Plantago patagonica</i>	0-6	-
	New Mexico goosefoot	CHNE3	<i>Chenopodium neomexicanum</i>	0-3	-
	sensitive partridge pea	CHNI2	<i>Chamaecrista nictitans</i>	0-3	-
	pitseed goosefoot	CHBE4	<i>Chenopodium berlandieri</i>	0-2	-
	scrambled eggs	COAU2	<i>Corydalis aurea</i>	0-2	-
	Wright's bird's beak	COWR2	<i>Cordylanthus wrightii</i>	0-2	-
	New Mexico thistle	CINE	<i>Cirsium neomexicanum</i>	0-2	-
	redstar	IPCO3	<i>Ipomoea coccinea</i>	0-2	-
	Thurber's morning-glory	IPTH	<i>Ipomoea thurberi</i>	0-2	-
	wedgeleaf draba	DRCU	<i>Draba cuneifolia</i>	0-2	-
	New Mexico copperleaf	ACNE	<i>Acalypha neomexicana</i>	0-2	-
	smallflowered milkvetch	ASNU4	<i>Astragalus nuttallianus</i>	0-2	-
	Thurber's milkvetch	ASTH	<i>Astragalus thurberi</i>	0-2	-
	Arizona poppy	KAGR	<i>Kallstroemia grandiflora</i>	0-2	-
	slender goldenweed	MAGR10	<i>Machaeranthera gracilis</i>	0-2	-
	tanseyleaf tansyaster	MATA2	<i>Machaeranthera tanacetifolia</i>	0-2	-
	spreading fanpetals	SIAB	<i>Sida abutifolia</i>	0-2	-
	sleepy silene	SIAN2	<i>Silene antirrhina</i>	0-1	-
	whitestem blazingstar	MEAL6	<i>Mentzelia albicaulis</i>	0-1	-
	sweet four o'clock	MILO2	<i>Mirabilis longiflora</i>	0-1	-
	desert evening primrose	OEPR	<i>Oenothera primiveris</i>	0-1	-
	Arizona phacelia	PHAR13	<i>Phacelia arizonica</i>	0-1	-
	Mangas Spring phacelia	PHBO4	<i>Phacelia bombycina</i>	0-1	-

Arizona popcornflower	PLAR	<i>Plagiobothrys arizonicus</i>	0-1	-
warty caltrop	KAPA	<i>Kallstroemia parviflora</i>	0-1	-
Gordon's bladderpod	LEGO	<i>Lesquerella gordonii</i>	0-1	-
broadleaved pepperweed	LELA2	<i>Lepidium latifolium</i>	0-1	-
intermediate pepperweed	LEVIM	<i>Lepidium virginicum var. medium</i>	0-1	-
dotted blazing star	LIPU	<i>Liatris punctata</i>	0-1	-
plains flax	LIPU4	<i>Linum puberulum</i>	0-1	-
foothill deervetch	LOHU2	<i>Lotus humistratus</i>	0-1	-
coastal bird's-foot trefoil	LOSAB	<i>Lotus salsuginosus var. brevivexillus</i>	0-1	-
shortstem lupine	LUBR2	<i>Lupinus brevicaulis</i>	0-1	-
bajada lupine	LUCOC	<i>Lupinus concinnus ssp. concinnus</i>	0-1	-
Fendler's desertdandelion	MAFE	<i>Malacothrix fendleri</i>	0-1	-
purslane	PORTU	<i>Portulaca</i>	0-1	-
yerba porosa	PORU6	<i>Porophyllum ruderale</i>	0-1	-
desert unicorn-plant	PRAL4	<i>Proboscidea althaeifolia</i>	0-1	-
doubleclaw	PRPA2	<i>Proboscidea parviflora</i>	0-1	-
Wright's cudweed	PSCAC2	<i>Pseudognaphalium canescens ssp. canescens</i>	0-1	-
Abert's creeping zinnia	SAAB	<i>Sanvitalia abertii</i>	0-1	-
sawtooth sage	SASU7	<i>Salvia subincisa</i>	0-1	-
wheelscale saltbush	ATEL	<i>Atriplex elegans</i>	0-1	-
fewflower beggarticks	BILE	<i>Bidens leptoccephala</i>	0-1	-
Coulter's spiderling	BOCO2	<i>Boerhavia coulteri</i>	0-1	-
erect spiderling	BOER	<i>Boerhavia erecta</i>	0-1	-
hoary bowlesia	BOIN3	<i>Bowlesia incana</i>	0-1	-
purple spiderling	BOPU	<i>Boerhavia purpurascens</i>	0-1	-
fringed redmaids	CACI2	<i>Calandrinia ciliata</i>	0-1	-
carelessweed	AMPA	<i>Amaranthus palmeri</i>	0-1	-
crested anoda	ANCR2	<i>Anoda cristata</i>	0-1	-
southwestern pricklypoppy	ARPL3	<i>Argemone pleiakantha</i>	0-1	-
halfmoon milkvetch	ASAL6	<i>Astragalus allochrous</i>	0-1	-
Abert's buckwheat	ERAB2	<i>Eriogonum abertianum</i>	0-1	-
sanddune wallflower	ERCA14	<i>Erysimum capitatum</i>	0-1	-
miniature woollystar	ERDI2	<i>Eriastrum diffusum</i>	0-1	-
spreading fleabane	ERDI4	<i>Erigeron divergens</i>	0-1	-
sorrel buckwheat	ERPO4	<i>Eriogonum polycladon</i>	0-1	-
California poppy	ESCAM	<i>Eschscholzia californica ssp. mexicana</i>	0-1	-
Arizona blanketflower	GAAR2	<i>Gaillardia arizonica</i>	0-1	-
red dome blanketflower	GAPI	<i>Gaillardia pinnatifida</i>	0-1	-
lesser yellowthroat gilia	GIFL	<i>Gilia flavocincta</i>	0-1	-
El Paso gilia	GIME	<i>Gilia mexicana</i>	0-1	-
Dakota mealycup	GLPIB	<i>Glandularia binnatifida var.</i>	0-1	-

	Dakota hook vervain	GLDIB	<i>Grindelia bipinnatifida</i> var. <i>bipinnatifida</i>	0-1	-
	curlytop gumweed	GRNUA	<i>Grindelia nuda</i> var. <i>aphanactis</i>	0-1	-
	El Paso skyrocket	IPTH2	<i>Ipomopsis thurberi</i>	0-1	-
	flaxflowered ipomopsis	IPLOL	<i>Ipomopsis longiflora</i> ssp. <i>longiflora</i>	0-1	-
	miner's lettuce	CLPEP	<i>Claytonia perfoliata</i> ssp. <i>perfoliata</i>	0-1	-
	camphorweed	HESU3	<i>Heterotheca subaxillaris</i>	0-1	-
	crestrub morning-glory	IPCO2	<i>Ipomoea costellata</i>	0-1	-
	cryptantha	CRYPT	<i>Cryptantha</i>	0-1	-
	Chihuahuan prairie clover	DAEX2	<i>Dalea exigua</i>	0-1	-
	American wild carrot	DAPU3	<i>Daucus pusillus</i>	0-1	-
	sacred thorn-apple	DAWR2	<i>Datura wrightii</i>	0-1	-
	New Mexico ticktrefoil	DENE	<i>Desmodium neomexicanum</i>	0-1	-
	western tansymustard	DEPI	<i>Descurainia pinnata</i>	0-1	-
	western trailing ticktrefoil	DEPR2	<i>Desmodium procumbens</i>	0-1	-
	poorjoe	DITE2	<i>Diodia teres</i>	0-1	-
	royal sandmat	CHDI5	<i>Chamaesyce dioica</i>	0-1	-
	pillpod sandmat	CHHI3	<i>Chamaesyce hirta</i>	0-1	-
	hyssopleaf sandmat	CHHY3	<i>Chamaesyce hyssopifolia</i>	0-1	-
	threadstem sandmat	CHRE4	<i>Chamaesyce revoluta</i>	0-1	-
	thymeleaf sandmat	CHSE6	<i>Chamaesyce serpyllifolia</i>	0-1	-
	slimseed sandmat	CHST8	<i>Chamaesyce stictospora</i>	0-1	-
Shrub/Vine					
8	Yucca like plants			22-112	
	sacahuista	NOMI	<i>Nolina microcarpa</i>	11-112	-
	soaptree yucca	YUEL	<i>Yucca elata</i>	6-28	-
	banana yucca	YUBA	<i>Yucca baccata</i>	1-22	-
	common sotol	DAWH2	<i>Dasyllirion wheeleri</i>	0-22	-
	Schott's yucca	YUSC	<i>Yucca ×schottii</i>	0-6	-
9	Dominant half shrubs			22-56	
	Utah fendlerbush	FEUTC	<i>Fendlerella utahensis</i> var. <i>cymosa</i>	0-22	-
	winterfat	KRLA2	<i>Krascheninnikovia lanata</i>	0-22	-
	rough menodora	MESC	<i>Menodora scabra</i>	0-17	-
	littleleaf ratany	KRER	<i>Krameria erecta</i>	1-17	-
	trailing krameria	KRLA	<i>Krameria lanceolata</i>	0-17	-
	fairyduster	CAER	<i>Calliandra eriophylla</i>	0-17	-
	featherplume	DAFO	<i>Dalea formosa</i>	1-17	-
	goldenhead	ACAMP	<i>Acamptopappus</i>	1-16	-
	trailing windmills	ALIN	<i>Allionia incarnata</i>	1-16	-
	chaparral asphead	ASHI3	<i>Aspicarpa hirtella</i>	1-16	-
	dense ayenia	AYMI	<i>Ayenia microphylla</i>	1-16	-
	hairyseed bahia	BAAB	<i>Bahia absinthifolia</i>	1-16	-
	field bindweed	COAR4	<i>Convolvulus arvensis</i>	1-16	-

	whitemouth dayflower	COER	<i>Commelina erecta</i>	1-16	-
	leatherweed	CRPO5	<i>Croton pottsii</i>	1-16	-
	spreading fleabane	ERDI4	<i>Erigeron divergens</i>	1-16	-
	trailing fleabane	ERFL	<i>Erigeron flagellaris</i>	1-16	-
	New Mexico fleabane	ERNE3	<i>Erigeron neomexicanus</i>	1-16	-
	wild dwarf morning-glory	EVAR	<i>Evolvulus arizonicus</i>	1-16	-
	Arizona snakecotton	FRAR2	<i>Froelichia arizonica</i>	1-16	-
	small matweed	GUDED	<i>Guilleminea densa var. densa</i>	1-16	-
	Wright's deervetch	LOWR	<i>Lotus wrightii</i>	1-16	-
	variableleaf bushbean	MAGI2	<i>Macroptilium gibbosifolium</i>	1-16	-
	rough menodora	MESC	<i>Menodora scabra</i>	1-16	-
	Cochise beardtongue	PEDA	<i>Penstemon dasyphyllus</i>	1-16	-
	Parry's beardtongue	PEPA24	<i>Penstemon parryi</i>	1-16	-
	Palmer's penstemon	PEPA8	<i>Penstemon palmeri</i>	1-16	-
	thinleaf goldenhead	PYLI2	<i>Pyrrocoma linearis</i>	1-16	-
	Texas snoutbean	RHSET	<i>Rhynchosia senna var. texana</i>	1-16	-
	spreading fanpetals	SIAB	<i>Sida abutifolia</i>	1-16	-
	scarlet globemallow	SPCO	<i>Sphaeralcea coccinea</i>	1-16	-
	brownplume wirelettuce	STPA4	<i>Stephanomeria pauciflora</i>	1-16	-
	Eureka dunegrass	SWAL	<i>Swallenia alexandrae</i>	1-16	-
	Hopi tea greenthread	THME	<i>Thelesperma megapotamicum</i>	1-16	-
	Palmer's crinkleemat	TIPA	<i>Tiquilia palmeri</i>	1-16	-
	desert zinnia	ZIAC	<i>Zinnia acerosa</i>	0-11	-
	bastardsage	ERWR	<i>Eriogonum wrightii</i>	0-6	-
	prairie acacia	ACAN	<i>Acacia angustissima</i>	0-6	-
	yerba de pasmo	BAPT	<i>Baccharis pteronioides</i>	0-6	-
	false boneset	BREU	<i>Brickellia eupatorioides</i>	0-2	-
10	Miscellaneous shrubs			0-56	
	Mexican cliffrose	PUME	<i>Purshia mexicana</i>	0-28	-
	New Mexico copperleaf	ACNE	<i>Acalypha neomexicana</i>	8-24	-
	onion	ALLIU	<i>Allium</i>	8-24	-
	pigweed	AMARA	<i>Amaranthus</i>	8-24	-
	ragweed	AMBRO	<i>Ambrosia</i>	8-24	-
	tuber anemone	ANTU	<i>Anemone tuberosa</i>	8-24	-
	rockcress	ARABI2	<i>Arabis</i>	8-24	-
	Watson's dutchman's pipe	ARWA	<i>Aristolochia watsonii</i>	8-24	-
	phacelia	PHACE	<i>Phacelia</i>	8-24	-
	ivyleaf groundcherry	PHHE4	<i>Physalis hederifolia</i>	8-24	-
	phlox	PHLOX	<i>Phlox</i>	8-24	-
	Arizona popcornflower	PLAR	<i>Plagiobothrys arizonicus</i>	8-24	-
	desert Indianwheat	PLOV	<i>Plantago ovata</i>	8-24	-
	white milkwort	POAL4	<i>Polygala alba</i>	8-24	-
	little hogweed	POOI	<i>Portulaca oleracea</i>	8-24	-

Common Name	Code	Scientific Name	Fl. Time	Notes
slimflower scurfpea	PSTE5	<i>Psoraleidium tenuiflorum</i>	8-24	-
chia	SACO6	<i>Salvia columbariae</i>	8-24	-
twinleaf senna	SEBA3	<i>Senna bauhinioides</i>	8-24	-
sleepy silene	SIAN2	<i>Silene antirrhina</i>	8-24	-
silverleaf nightshade	SOEL	<i>Solanum elaeagnifolium</i>	8-24	-
pinewoods spiderwort	TRPI	<i>Tradescantia pinetorum</i>	8-24	-
branched noseburn	TRRA5	<i>Tragia ramosa</i>	8-24	-
Fort Huachuca vervain	VEGR2	<i>Verbena gracilis</i>	8-24	-
American vetch	VIAM	<i>Vicia americana</i>	8-24	-
Rocky Mountain zinnia	ZIGR	<i>Zinnia grandiflora</i>	8-24	-
littleleaf sumac	RHMI3	<i>Rhus microphylla</i>	0-17	-
desert ceanothus	CEGR	<i>Ceanothus greggii</i>	0-17	-
hairy mountain mahogany	CEMOP	<i>Cercocarpus montanus</i> var. <i>paucidentatus</i>	0-6	-
Warnock's snakewood	COWA	<i>Condalia warnockii</i>	0-6	-
Kearney's snakewood	COWAK	<i>Condalia warnockii</i> var. <i>kearneyana</i>	0-6	-
longleaf jointfir	EPTR	<i>Ephedra trifurca</i>	0-6	-
ocotillo	FOSP2	<i>Fouquieria splendens</i>	0-6	-
catclaw mimosa	MIACB	<i>Mimosa aculeaticarpa</i> var. <i>biuncifera</i>	0-6	-
mariola	PAIN2	<i>Parthenium incanum</i>	0-6	-
evergreen sumac	RHVIC	<i>Rhus virens</i> var. <i>choriophylla</i>	0-6	-
Wright's beebrush	ALWR	<i>Aloysia wrightii</i>	0-2	-
broom snakeweed	GUSA2	<i>Gutierrezia sarothrae</i>	0-2	-
milkvetch	ASTRA	<i>Astragalus</i>	1-2	-
lyreleaf greeneyes	BELY	<i>Berlandiera lyrata</i>	1-2	-
fringed redmaids	CACI2	<i>Calandrinia ciliata</i>	1-2	-
exserted Indian paintbrush	CAEXE	<i>Castilleja exserta</i> ssp. <i>exserta</i>	1-2	-
mariposa lily	CALOC	<i>Calochortus</i>	1-2	-
Indian paintbrush	CASTI2	<i>Castilleja</i>	1-2	-
lambsquarters	CHAL7	<i>Chenopodium album</i>	1-2	-
hyssopleaf sandmat	CHHY3	<i>Chamaesyce hyssopifolia</i>	1-2	-
New Mexico thistle	CINE	<i>Cirsium neomexicanum</i>	1-2	-
mala mujer	CNAN	<i>Cnidoscolus angustidens</i>	1-2	-
nodding bird's-beak	COLA4	<i>Cordylanthus laxiflorus</i>	1-2	-
James' prairie clover	DAJA	<i>Dalea jamesii</i>	1-2	-
American wild carrot	DAPU3	<i>Daucus pusillus</i>	1-2	-
New Mexico ticktrefoil	DENE	<i>Desmodium neomexicanum</i>	1-2	-
western tansymustard	DEPI	<i>Descurainia pinnata</i>	1-2	-
miniature woollystar	ERDI2	<i>Eriastrum diffusum</i>	1-2	-
buckwheat	ERIOG	<i>Eriogonum</i>	1-2	-
shaggy dwarf morning-glory	EVNU	<i>Evolvulus nuttallianus</i>	1-2	-
longleaf false goldeneve	HELOA2	<i>Heliomeris longifolia</i> var. <i>annua</i>	1-2	-

	Parry's dwarf-sunflower	HEPA	<i>Helianthella parryi</i>	1-2	-
	red bluet	HORU	<i>Houstonia rubra</i>	1-2	-
	ragged nettlespurge	JAMA	<i>Jatropha macrorhiza</i>	1-2	-
	Arizona poppy	KAGR	<i>Kallstroemia grandiflora</i>	1-2	-
	Coulter's horseweed	LACO13	<i>Laennecia coulteri</i>	1-2	-
	Fendler's bladderpod	LEFE	<i>Lesquerella fendleri</i>	1-2	-
	Goodding's bladderpod	LEGO2	<i>Lesquerella gooddingii</i>	1-2	-
	intermediate pepperweed	LEVIM	<i>Lepidium virginicum var. medium</i>	1-2	-
	Lewis flax	LILE3	<i>Linum lewisii</i>	1-2	-
	plains flax	LIPU4	<i>Linum puberulum</i>	1-2	-
	woodland-star	LITHO2	<i>Lithophragma</i>	1-2	-
	Greene's bird's-foot trefoil	LOGR4	<i>Lotus greenei</i>	1-2	-
	foothill deervetch	LOHU2	<i>Lotus humistratus</i>	1-2	-
	coastal bird's-foot trefoil	LOSAB	<i>Lotus salsuginosus var. brevivexillus</i>	1-2	-
	lupine	LUPIN	<i>Lupinus</i>	1-2	-
	hoary tansyaster	MACA2	<i>Machaeranthera canescens</i>	1-2	-
	whitestem blazingstar	MEAL6	<i>Mentzelia albicaulis</i>	1-2	-
	green carpetweed	MOVE	<i>Mollugo verticillata</i>	1-2	-
	Drummond's woodsorrel	OXDR	<i>Oxalis drummondii</i>	1-2	-
	locoweed	OXYTR	<i>Oxytropis</i>	1-2	-
	wild parsnip	PASA2	<i>Pastinaca sativa</i>	1-2	-
	longstalk chinchweed	PELO	<i>Pectis longipes</i>	1-2	-
	skunkbush sumac	RHTR	<i>Rhus trilobata</i>	0-1	-
	whitethorn acacia	ACCO2	<i>Acacia constricta</i>	0-1	-
	catclaw acacia	ACGR	<i>Acacia greggii</i>	0-1	-
11	Succulents			0-11	
	Parry's agave	AGPAP5	<i>Agave parryi ssp. parryi</i>	0-11	-
	Palmer's century plant	AGPA3	<i>Agave palmeri</i>	0-2	-
	Parry's agave	AGPA4	<i>Agave parryi</i>	0-2	-
	Schott's century plant	AGSC3	<i>Agave schottii</i>	0-1	-
	Scheer's beehive cactus	COROS	<i>Coryphantha robustispina ssp. scheeri</i>	0-1	-
	walkingstick cactus	CYSP8	<i>Cylindropuntia spinosior</i>	0-1	-
	pinkflower hedgehog cactus	ECFEF3	<i>Echinocereus fendleri ssp. fendleri</i>	0-1	-
	white fishhook cactus	ECIN2	<i>Echinomastus intertextus</i>	0-1	-
	rainbow hedgehog cactus	ECRI3	<i>Echinocereus rigidissimus</i>	0-1	-
	spinystar	ESVI2	<i>Escobaria vivipara</i>	0-1	-
	Graham's nipple cactus	MAGR9	<i>Mammillaria grahamii</i>	0-1	-
	Macdougal's nipple cactus	MAHEM	<i>Mammillaria heyderi var. macdougalii</i>	0-1	-
	Wright's nipple cactus	MAWR2	<i>Mammillaria wrightii</i>	0-1	-

	cactus apple	OPEN3	<i>Opuntia engelmannii</i>	0-1	-
	twistspine pricklypear	OPMA2	<i>Opuntia macrorhiza</i>	0-1	-
	purple pricklypear	OPMA8	<i>Opuntia macrocentra</i>	0-1	-
	tulip pricklypear	OPPH	<i>Opuntia phaeacantha</i>	0-1	-
Tree					
12	Trees			0-22	
	oneseed juniper	JUMO	<i>Juniperus monosperma</i>	0-22	-
	Arizona white oak	QUAR	<i>Quercus arizonica</i>	0-6	-
	Emory oak	QUEM	<i>Quercus emoryi</i>	0-6	-
	Mexican blue oak	QUOB	<i>Quercus oblongifolia</i>	0-6	-
	alligator juniper	JUDE2	<i>Juniperus deppeana</i>	0-1	-

Animal community

This plant community is suitable for grazing by all classes of livestock at any season. High soil pH can limit the availability of some essential plant nutrients and soil water, reducing the forage quality, quantity and length of green season compared to adjacent non-limy sites. Moderate slopes, very gravelly/cobbly surfaces and the differences in forage palatability limit grazing distribution on this site. Large areas should be fenced separately from non-limy hills and uplands to effectively manage the forage resources.

This site has enough topography and/or tree cover to be home to both mule deer and Coues whitetail. It is also habitat for pronghorn antelope. The potential plant community is rich in both grass and forb species, making the site home to a variety of insect, bird, small mammal and reptile species. Natural water is lacking in areas of the site and water developments are very important to large mammals and many species of birds and small mammals using this habitat.

Hydrological functions

These soils are very coarse textured; but are shallow to lime cemented layers and are fair to good producers of runoff.

Recreational uses

Hunting, hiking, horseback riding, photography, camping and picnicking

Wood products

None, unless one-seed juniper has increased on the site.

Other products

Beargrass is harvested for fibers by Mexican companies operating out of Agua Prieta, Sonora. Beargrass and soapweed yucca fibers are also harvested by Native Americans like the Tohono O'odham for use in making baskets and other arts and crafts. Medicinal plants like yerba de pasmo, Hopi tea and mormon tea are harvested locally.

Inventory data references

Range 417s include 1 in excellent condition and 1 in good condition.

Type locality

Location 1: Cochise County, AZ	
Township/Range/Section	T21S R19E S20

General legal description	Fort Huachuca, west range
Location 2: Cochise County, AZ	
Latitude	32° 26' 78"
Longitude	110° 1' 70"
General legal description	Un-grazed (sub-divided) area just south of Dragoon, Az.
Location 3: Santa Cruz County, AZ	
Township/Range/Section	T21S R17E S11
General legal description	Babocomari Ranch, West pasture in SW corner.

Contributors

Dan Robinett
Larry D. Ellicott

Approval

Curtis Talbot, 4/09/2021

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)	Wilma Renken, Dan Robinett, Larry Humphrey, Linda Kennedy, Scott Stratton
Contact for lead author	USDA-NRCS Tucson MLRA Soil Survey Office
Date	05/01/2014
Approved by	Curtis Talbot
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

Indicators

1. **Number and extent of rills:** None

2. **Presence of water flow patterns:** Common, short (3-5 ft.), and discontinuous. Surface water flow between perennial plant bases is interrupted by rocks and gravel.

3. **Number and height of erosional pedestals or terracettes:** Pedestals, 1/2" height, are common on perennial grasses; terracettes are common, 3-5 ft apart, 1" elevation difference.

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

bare ground): 17% bare ground, non-vegetated areas are <2 ft diameter and soil is well-armored with gravel and rocks.

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):** Fine litter moving short distance (1-2ft) to lower edge of terracettes

8. **Soil surface (top few mm) resistance to erosion (stability values are averages - most sites will show a range of values):** Slake test values of 5 and 6 were uniform across site. 85% of samples were scored at 6.

9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** Soil surface horizon texture gravelly loam, 5" depth with granular structure. Color 10YR 3/3 dry, 2/2 moist

10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:** 10% perennial basal cover. Perennial grasses are evenly distributed across site with low shrubs and perennial forbs interspersed. 32% rock and gravel cover.

11. **Presence and thickness of compaction layer (usually none; describe soil profile features which may be mistaken for compaction on this site):** No compaction. No soil features that could be mistaken for compaction. Soil penetrometer test average was 5.9 cm with range in values from 5 cm to 8 cm.

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 mid-grasses > suffrutescent grasses

Sub-dominant: low shrubs > perennial forbs

Other: succulents

Additional: annual grasses and forbs

13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):** Decadence common on perennial grasses, 11 years since last fire. Build-up of annual biomass and plant decadence is expected as fire-free period lengthens.

14. **Average percent litter cover (%) and depth (in):** Litter is confined to vegetated areas.

15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):** 306 lbs/ac. in a below average year; 720 lbs/ac. in an average year; 1125 lbs/ac. in an above average year.

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:** Lehmann lovegrass, Boers lovegrass, mesquite, white-thorn acacia, wait-a-bit

17. **Perennial plant reproductive capability:** Not impaired.
