

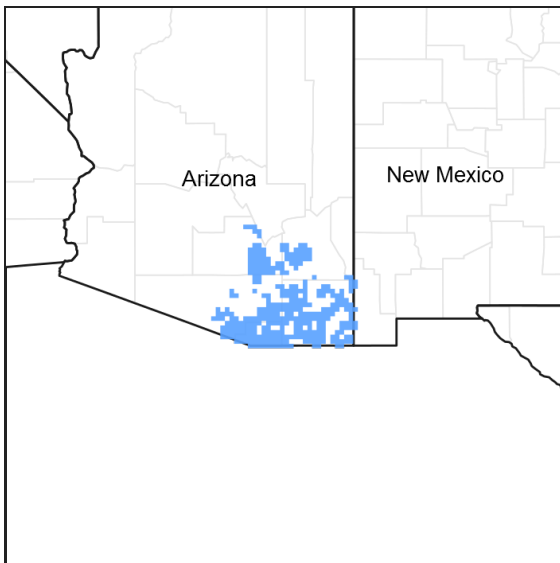
# Ecological site R041XC316AZ

## Sandy Wash 12-16" p.z.

Accessed: 02/10/2025

### General information

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



**Figure 1. Mapped extent**

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

### MLRA notes

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

AZ 41.3 – Chihuahuan – Sonoran Semidesert Grasslands

Elevations range from 3200 to 5000 feet and precipitation ranges from 12 to 16 inches per year. Vegetation includes mesquite, catclaw acacia, netleaf hackberry, palo verde, false mesquite, range ratany, fourwing saltbush, tarbush, littleleaf sumac, sideoats grama, black grama, plains lovegrass, cane beardgrass, tobosa, vine mesquite, threeawns, Arizona cottontop and bush muhly. The soil temperature regime is thermic and the soil moisture regime is ustic aridic. This unit occurs within the Basin and Range Physiographic Province and is characterized by numerous mountain ranges that rise abruptly from broad, plain-like valleys and basins. Igneous and metamorphic rock classes dominate the mountain ranges and sediments filling the basins represent combinations of fluvial, lacustrine, colluvial and alluvial deposits.

### Associated sites

R041XC306AZ	<b>Shallow Hills 12-16" p.z.</b>
R041XC308AZ	<b>Limy Slopes 12-16" p.z.</b>
R041XC309AZ	<b>Limy Upland 12-16" p.z.</b>

R041XC313AZ	Loamy Upland 12"-16" p.z.
R041XC318AZ	Sandy Loam 12-16" p.z. Deep
R041XC319AZ	Sandy Loam Upland 12-16" p.z.
R041XC322AZ	Shallow Upland 12-16" p.z.
R041XC330AZ	Volcanic Hills 12-16" p.z. Clayey

### Similar sites

R041XB213AZ	Sandy Wash 8-12" p.z.
R040XA115AZ	Sandy Wash 10"-13" p.z.

Table 1. Dominant plant species

Tree	(1) <i>Prosopis</i> (2) <i>Acacia greggii</i>
Shrub	(1) <i>Celtis pallida</i>
Herbaceous	Not specified

### Physiographic features

This site occurs in the middle elevations of the Madrean Basin and Range province in southeastern Arizona. It occurs on floodplains, low stream terraces; in canyons and on alluvial fans. It benefits on a regular basis from extra moisture received as over-bank flooding of channels and as runoff from adjacent upland areas. It does not benefit from shallow water tables.

Table 2. Representative physiographic features

Landforms	(1) Flood plain (2) Stream terrace (3) Canyon
Flooding duration	Very brief (4 to 48 hours) to brief (2 to 7 days)
Flooding frequency	Occasional to frequent
Ponding duration	Very brief (4 to 48 hours)
Ponding frequency	None to rare
Elevation	3,200–5,000 ft
Slope	0–3%
Aspect	Aspect is not a significant factor

### Climatic features

Precipitation in this common resource area ranges from 12-16 inches yearly in the eastern part with elevations from 3600-5000 feet, and 13-17 inches in the western part where elevations are 3300-4500 feet. Winter-Summer rainfall ratios are 40-60% in the west and 30-70% in the east. Summer rains fall July-September, originate in the Gulf of Mexico and are convective, usually brief, intense thunderstorms. Cool season moisture tends to be frontal, originates in the Pacific and Gulf of California, and falls in widespread storms with long duration and low intensity. Snow rarely lasts more than one day. May and June are the driest months of the year. Humidity is generally very low.

Temperatures are mild. Freezing temperatures are common at night from December-April; however temperatures during the day are frequently above 50 F. Occasionally in December-February, brief 0 F temperatures may be experienced some nights. During June, July and August, some days may exceed 100 F.

Cool season plants start growth in early spring and mature in early summer. Warm season plants take advantage of summer rains and are growing and nutritious July-September. Warm season grasses may remain green throughout the year.

**Table 3. Representative climatic features**

Frost-free period (average)	220 days
Freeze-free period (average)	0 days
Precipitation total (average)	16 in

## Influencing water features

There are no water features associated with this site.

## Soil features

These are very young soils on gravelly and sandy alluvium of mixed origin. They are deep and well drained. Surface textures range from gravelly sand to loamy fine sand. Sub-soils are sandy loam and loamy sands with various amounts of gravel and/or cobbles. Although coarse textures make for low available water holding capacities, plant-soil moisture relationships are very good due to extra moisture the site receives. Soil surfaces, outside of channel areas, are dark colored.

Soils mapped on this site include: SSA-661 Eastern Pinal & Southern Gila counties MU 6 Bodecker; SSA-663 Gila-Duncan area MU's 7 Camoro & Santo Tomas, 36 Santo Tomas; SSA-664 San Simon area MU 36 Santo Tomas; SSA-666 Cochise county Northwest part MU's 7 Bodecker and 52 Keesto; SSA-667 Santa Cruz area MU's CtB & GbB Comoro; SSA-669 Pima county Eastern part MU's 19 & 68 Comoro; SSA-671 Cochise county Douglas-Tombstone part MU's 9 Bodecker & Comoro, 10 Bodecker GrVSL, 11 Bodecker GrVSL saline-sodic, 33 Comoro SL, 34 Comoro SL saline-sodic, 94 Keesto and 127 Bodecker; SSA-703 Tohono O'odham Nation MU 38 Keesto.

**Table 4. Representative soil features**

Family particle size	(1) Sandy
Drainage class	Excessively drained to well drained
Permeability class	Very rapid to moderately rapid
Soil depth	60 in
Surface fragment cover <=3"	10–25%
Surface fragment cover >3"	0–10%
Available water capacity (0-40in)	2.4–6 in
Calcium carbonate equivalent (0-40in)	0–5%
Electrical conductivity (0-40in)	0–2 mmhos/cm
Sodium adsorption ratio (0-40in)	0–2
Soil reaction (1:1 water) (0-40in)	7.4–8.4
Subsurface fragment volume <=3" (Depth not specified)	5–45%
Subsurface fragment volume >3" (Depth not specified)	0–10%

## Ecological dynamics

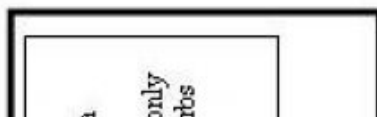
The plant communities found on an ecological site are naturally variable. Composition and production will vary with yearly conditions, location, aspect, and the natural variability of the soils. The Historical Climax Plant Community represents the natural potential plant communities found on relict or 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.

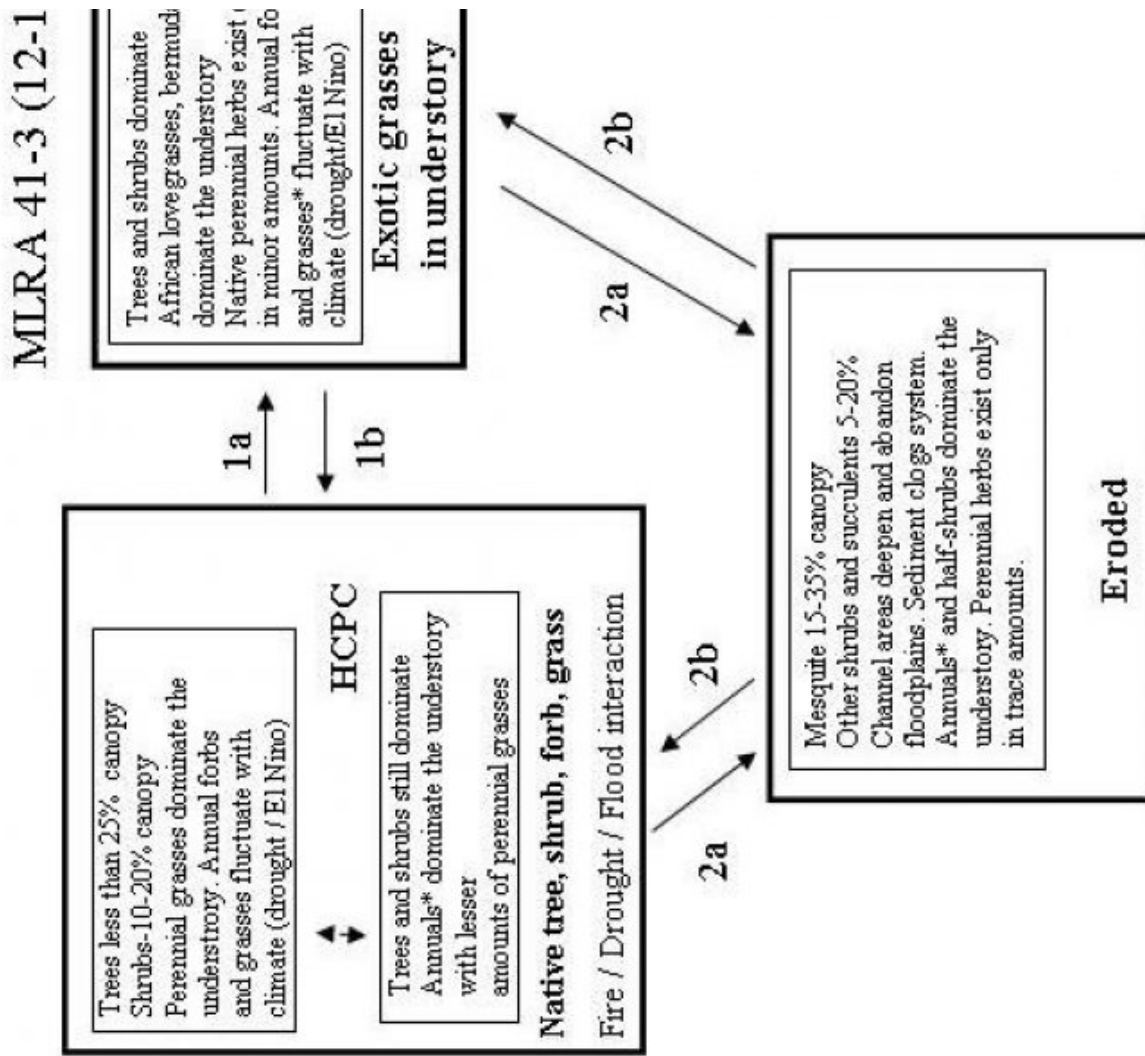
NRCS uses a Similarity Index to compare existing plant communities to the plant communities described here. Similarity index is determined by comparing the production and composition of a plant community to the production and composition of a plant community described in this site description. To determine 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 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. The potential plant community on this site is a diverse mixture of native perennial grasses, shrubs, vines, trees and annual forbs and grasses. Smaller drainage-ways are dominated by desert trees like mesquite, desert willow and catclaw acacia. Larger washes and canyons will have a higher percentage of broadleaf trees like ash, walnut and netleaf hackberry.

## State and transition model

6"), Sandy Wash



- 1a. CHG, introduction of a seed source, or direct seeding of exotic African lovegrasses, bermuda or Johnson grass.
  - 1b. Unknown. Possible herbicide treatment of exotics species and seeding of native grasses.
  - 2a. Poor condition watershed areas produce excess amounts of runoff causing channels to erode. As channels deepen stream terraces no longer flood. Trees and large shrubs still dominate. Perennial herbs are replaced by annuals and half shrubs. Base level change in main stream causes down-cutting of bottoms. Poor condition watersheds can also deliver large amounts of sediment to bottoms, destabilizing them and causing new channels to cut through the floodplain.
  - 2b. PG/NG of watershed areas with or without shrub control planting of native grasses, maintenance treatments for shrubs, etc. Mechanical control of sheet, rill and gully erosion where possible. Reestablish flooding regime of bottoms.
- CHG - continuous heavy grazing  
PG/NG - proper grazing, no grazing
- re annuals dominant,  
e patches of some non-natives



\*Native may b

Figure 4. State and Transition, Sandy Wash 12-16" pz.

**State 1  
 Historic Climax Plant Community**

**Community 1.1  
 Historic Climax Plant Community**

The potential plant community of this site is a diverse mixture of perennial grasses, forbs, vines, trees and shrubs. Annual forbs and grasses of both the warm and cool seasons are well represented in the plant community. The major grass, forb and shrub species on the site are well dispersed throughout the plant community. The aspect is savannah. Periodic natural fires were important in maintaining a balance between woody species and herbaceous species. With continuous heavy grazing, palatable mid-grasses decline and species such as Rothrock grama, dropseed and threeawns increase. With severe deterioration, woody species increase to dominate the plant community. Mesquite, with lesser amounts of catclaw acacia and desert willow, form the over-story and burweed dominates the under-story. Actively eroding areas become dominated by shrubs like burrobrush, rubber rabbitbush, batamote and desert broom. The site is very susceptible to gully, channel and bank erosion, especially where it has deteriorated to shrubby conditions and where depleted watershed areas are contributing larger than normal amounts of runoff. The lowering of the base level of the axial stream of a watershed will eventually cause channeling of the site. Deeply channeled areas will no longer flood the stream terraces of this site. Due to deep, course textured soils and extra moisture received as flooding, trees grow to maximum size on the site. This site can produce effective herbaceous covers with tree canopies up to 25%.

Table 5. Annual production by plant type

Plant Type	Low (Lb/Acre)	Representative Value (Lb/Acre)	High (Lb/Acre)
Grass/Grasslike	410	1000	1500
Tree	300	500	800
Forb	40	100	550
Shrub/Vine	75	200	300
<b>Total</b>	<b>825</b>	<b>1800</b>	<b>3150</b>

Table 6. Soil surface cover

Tree basal cover	2-4%
Shrub/vine/liana basal cover	1-2%
Grass/grasslike basal cover	5-15%
Forb basal cover	0-1%
Non-vascular plants	0-1%
Biological crusts	0-2%
Litter	35-75%
Surface fragments >0.25" and <=3"	10-25%
Surface fragments >3"	0-10%
Bedrock	0-2%
Water	0%
Bare ground	25-45%

Table 7. Canopy structure (% cover)

Height Above Ground (Ft)	Tree	Shrub/Vine	Grass/Grasslike	Forb
<0.5	–	–	0-5%	0-2%
>0.5 <= 1	–	–	0-5%	0-5%
>1 <= 2	–	0-5%	5-15%	1-10%
>2 <= 4.5	0-1%	1-5%	10-25%	0-5%
>4.5 <= 13	1-10%	1-10%	0-10%	–
>13 <= 40	15-25%	–	–	–
>40 <= 80	–	–	–	–
>80 <= 120	–	–	–	–
>120	–	–	–	–

Figure 6. Plant community growth curve (percent production by month). AZ4134, 41.3 12-16" p.z. other sites. Growth begins in the spring, semi-dormancy occurs during the May through June drought, most growth occurs during the summer rains..

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

## State 2

### Understory exotic perennial grasses

#### Community 2.1

## Understory exotic perennial grasses

This state exists where perennial African grasses like bermuda grass and; Lehmann, Boer, Cochise and Weeping lovegrass, have either been seeded or have invaded from adjacent areas to become dominant in the under-story. These species usually have little effect on the over-story tree and large shrub component of the plant community. They do, however, greatly limit the diversity of native grasses and forbs.

### State 3 Eroded

#### Community 3.1 Eroded



Figure 7. Sandy Bottom 12-16" pz, eroded

This state occurs where poor condition watersheds yield excessive amounts of runoff causing erosion of the channel areas. As channels deepen, the low stream terraces no longer receive extra water from flooding and stream-bank erosion enlarges the area of river-wash. Down-cutting of major stream systems can contribute to this situation in areas where sandy bottoms are tributary to the main stream. The woody component of the plant community usually remains intact but the herbaceous component becomes dominated by half-shrubs and annuals. Poor condition watersheds can also destabilize the sandy bottom site by adding more sediment than the system can handle, causing channels to move and cut through new areas on the floodplain.

## Additional community tables

Table 8. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Lb/Acre)	Foliar Cover (%)
<b>Grass/Grasslike</b>					
1	<b>Dominant mid grasses</b>			300–600	
	sideoats grama	BOCU	<i>Bouteloua curtipendula</i>	100–300	–
	green sprangletop	LEDU	<i>Leptochloa dubia</i>	25–200	–
	big sacaton	SPWR2	<i>Sporobolus wrightii</i>	0–200	–
	plains bristlegrass	SEVU2	<i>Setaria vulpiseta</i>	15–100	–
	spike dropseed	SPCO4	<i>Sporobolus contractus</i>	25–100	–
	cane bluestem	BOBA3	<i>Bothriochloa barbinodis</i>	5–100	–
2	<b>Suffrutescent grasses</b>			50–300	
	bush muhly	MUPO2	<i>Muhlenbergia porteri</i>	50–200	–
	Arizona cottontop	DICA8	<i>Digitaria californica</i>	15–150	–
	Santa Rita threeawn	ARCAG	<i>Aristida californica var. glabrata</i>	0–50	–
3	<b>Miscellaneous Grasses</b>			50–100	

	spidergrass	ARTE3	<i>Aristida ternipes</i>	20–50	–
	spidergrass	ARTEG	<i>Aristida ternipes</i> var. <i>gentilis</i>	10–50	–
	tanglehead	HECO10	<i>Heteropogon contortus</i>	0–50	–
	deergrass	MURI2	<i>Muhlenbergia rigens</i>	0–50	–
	whiplash pappusgrass	PAVA2	<i>Pappophorum vaginatum</i>	0–50	–
	sand dropseed	SPCR	<i>Sporobolus cryptandrus</i>	0–25	–
	squirreltail	ELELE	<i>Elymus elymoides</i> ssp. <i>elymoides</i>	5–25	–
	black grama	BOER4	<i>Bouteloua eriopoda</i>	0–25	–
	blue grama	BOGR2	<i>Bouteloua gracilis</i>	0–25	–
	hairy grama	BOHI2	<i>Bouteloua hirsuta</i>	0–25	–
	Rothrock's grama	BORO2	<i>Bouteloua rothrockii</i>	0–25	–
	Parish's threeawn	ARPUP5	<i>Aristida purpurea</i> var. <i>parishii</i>	0–25	–
	Orcutt's threeawn	ARSCO	<i>Aristida schiedeana</i> var. <i>orcuttiana</i>	0–25	–
	vine mesquite	PAOB	<i>Panicum obtusum</i>	0–25	–
	purple threeawn	ARPU9	<i>Aristida purpurea</i>	0–15	–
	fall witchgrass	DICO6	<i>Digitaria cognata</i>	0–15	–
	plains lovegrass	ERIN	<i>Eragrostis intermedia</i>	0–15	–
	alkali sacaton	SPAI	<i>Sporobolus airoides</i>	0–15	–
	mesa dropseed	SPFL2	<i>Sporobolus flexuosus</i>	0–10	–
	poverty threeawn	ARDI5	<i>Aristida divaricata</i>	0–10	–
	Fendler threeawn	ARPUL	<i>Aristida purpurea</i> var. <i>longiseta</i>	0–5	–
	blue threeawn	ARPUN	<i>Aristida purpurea</i> var. <i>nealleyi</i>	0–5	–
	sedge	CAREX	<i>Carex</i>	0–5	–
	low woollygrass	DAPU7	<i>Dasyochloa pulchella</i>	0–5	–
	nineawn pappusgrass	ENDE	<i>Enneapogon desvauxii</i>	0–5	–
	bulb panicgrass	PABU	<i>Panicum bulbosum</i>	0–5	–
	knotgrass	PADI6	<i>Paspalum distichum</i>	0–5	–
4	<b>Annual grasses</b>			10–400	
	prairie threeawn	AROL	<i>Aristida oligantha</i>	1–100	–
	Parry's grama	BOPA2	<i>Bouteloua parryi</i>	0–100	–
	feather fingergrass	CHVI4	<i>Chloris virgata</i>	1–100	–
	tapertip cupgrass	ERACA	<i>Eriochloa acuminata</i> var. <i>acuminata</i>	0–50	–
	mucronate sprangletop	LEPAB	<i>Leptochloa panicea</i> ssp. <i>brachiata</i>	0–50	–
	Mexican panicgrass	PAHI5	<i>Panicum hirticaule</i>	0–50	–
	sixweeks fescue	VUOC	<i>Vulpia octoflora</i>	1–50	–
	Arizona brome	BRAR4	<i>Bromus arizonicus</i>	0–50	–
	needle grama	BOAR	<i>Bouteloua aristidoides</i>	1–50	–
	Bigelow's bluegrass	POBI	<i>Poa bigelovii</i>	0–25	–
	Arizona signalgrass	URAR	<i>Urochloa arizonica</i>	0–25	–
	Arizona barley	HOAR	<i>Hordeum arizonicum</i>	0–25	–
	Mexican sprangletop	LEFUU	<i>Leptochloa fusca</i> ssp. <i>uninervia</i>	0–25	–
	desert lovegrass	ERPEM	<i>Eragrostis pectinacea</i> var. <i>miserrima</i>	0–25	–
	sixweeks threeawn	ARAD	<i>Aristida adscensionis</i>	0–20	–



	sixweeks grama	BOBA2	<i>Bouteloua barbata</i>	0–10	–
	tufted lovegrass	ERPEP2	<i>Eragrostis pectinacea</i> var. <i>pectinacea</i>	0–10	–
	sweet tanglehead	HEME	<i>Heteropogon melanocarpus</i>	0–10	–
	Mexican lovegrass	ERME	<i>Eragrostis mexicana</i>	0–10	–
	delicate muhly	MUFR	<i>Muhlenbergia fragilis</i>	0–10	–
	littleseed muhly	MUMI	<i>Muhlenbergia microsperma</i>	0–10	–
	witchgrass	PACA6	<i>Panicum capillare</i>	0–10	–
<b>Forb</b>					
5	<b>Perennial Forbs</b>			20–100	
	weakleaf bur ragweed	AMCO3	<i>Ambrosia confertiflora</i>	1–35	–
	redstar	IPCO3	<i>Ipomoea coccinea</i>	0–30	–
	canaigre dock	RUHY	<i>Rumex hymenosepalus</i>	5–30	–
	Lemmon's ragwort	SELE8	<i>Senecio lemmonii</i>	1–25	–
	desert globemallow	SPAM2	<i>Sphaeralcea ambigua</i>	1–25	–
	gooseberryleaf globemallow	SPGR2	<i>Sphaeralcea grossulariifolia</i>	0–25	–
	brownplume wirelettuce	STPA4	<i>Stephanomeria pauciflora</i>	1–25	–
	Trans-Pecos thimblehead	HYWI	<i>Hymenothrix wislizeni</i>	1–25	–
	scarlet spiderling	BOCO	<i>Boerhavia coccinea</i>	1–25	–
	climbing wartclub	BOSC	<i>Boerhavia scandens</i>	1–25	–
	Thurber's cotton	GOTH	<i>Gossypium thurberi</i>	0–25	–
	fingerleaf gourd	CUDI	<i>Cucurbita digitata</i>	1–15	–
	coyote gourd	CUPA	<i>Cucurbita palmata</i>	0–15	–
	brownfoot	ACWR5	<i>Acourtia wrightii</i>	0–15	–
	Gila manroot	MAGI	<i>Marah gilensis</i>	0–15	–
	lacy tansyaster	MAPI	<i>Machaeranthera pinnatifida</i>	1–15	–
	desert tobacco	NIOB	<i>Nicotiana obtusifolia</i>	0–10	–
	variableleaf bushbean	MAGI2	<i>Macroptilium gibbosifolium</i>	0–10	–
	Parry's beardtongue	PEPA24	<i>Penstemon parryi</i>	0–10	–
	mesquite mistletoe	PHCA8	<i>Phoradendron californicum</i>	1–10	–
	hairy fourwort	TENE	<i>Tetramerium nervosum</i>	0–10	–
	perennial rockcress	ARPE2	<i>Arabis perennans</i>	0–10	–
	Arizona foldwing	DIRE4	<i>Dicliptera resupinata</i>	0–10	–
	spreading fleabane	ERDI4	<i>Erigeron divergens</i>	0–10	–
	fringed twinevine	FUCYC	<i>Funastrum cynanchoides</i> ssp. <i>cynanchoides</i>	0–10	–
	southwestern mock vervain	GLGO	<i>Glandularia gooddingii</i>	0–10	–
	small matweed	GUDE	<i>Guilleminea densa</i>	0–5	–
	Lewis flax	LILE3	<i>Linum lewisii</i>	0–5	–
	Wright's deervetch	LOWR	<i>Lotus wrightii</i>	0–5	–
	Coulter's lyrepod	LYCO4	<i>Lyrocarpa coulteri</i>	0–5	–
	roving sailor	MAAN9	<i>Maurandella antirrhiniflora</i>	0–5	–
	wild dwarf morning-glory	EVAR	<i>Evolvulus arizonicus</i>	0–5	–
	spreading sandcherry	DYCO5	<i>Dryopteris sandcherry</i> var. <i>deumbona</i>	0–5	–

	spreading snakenerb	DYSCD	<i>Dyschoriste scniegeana</i> var. <i>decumbens</i>	0-5	-
	Cooley's bundleflower	DECO2	<i>Desmanthus cooleyi</i>	0-5	-
	Missouri gourd	CUFO	<i>Cucurbita foetidissima</i>	0-5	-
	desert marigold	BAMU	<i>Baileya multiradiata</i>	0-5	-
	Arizona wrightwort	CAAR7	<i>Carlowrightia arizonica</i>	0-5	-
	skeletonweed	CHAET	<i>Chaetadelpha</i>	0-5	-
	rose heath	CHER2	<i>Chaetopappa ericoides</i>	0-5	-
	whitemouth dayflower	COER	<i>Commelina erecta</i>	0-5	-
	trailing windmills	ALIN	<i>Allionia incarnata</i>	0-5	-
	tarragon	ARDR4	<i>Artemisia dracunculus</i>	0-5	-
	white sagebrush	ARLU	<i>Artemisia ludoviciana</i>	0-5	-
	American vetch	VIAM	<i>Vicia americana</i>	0-5	-
	Louisiana vetch	VILU	<i>Vicia ludoviciana</i>	0-5	-
	slimleaf bean	PHAN3	<i>Phaseolus angustissimus</i>	0-5	-
	Wright's cudweed	PSCAC2	<i>Pseudognaphalium canescens</i> ssp. <i>canescens</i>	0-5	-
	Colorado Desert mistletoe	PHMA18	<i>Phoradendron macrophyllum</i>	0-5	-
	tufted evening primrose	OECA10	<i>Oenothera caespitosa</i>	0-5	-
	wishbone-bush	MILAV	<i>Mirabilis laevis</i> var. <i>villosa</i>	0-5	-
	sweet four o'clock	MILO2	<i>Mirabilis longiflora</i>	0-5	-
	Coulter's wrinklefruit	TECO	<i>Tetradlea coulteri</i>	0-5	-
	ragged nettlespurge	JAMA	<i>Jatropha macrorhiza</i>	0-2	-
	velvetseed milkwort	POOB	<i>Polygala obscura</i>	0-2	-
	shrubby purslane	POSU3	<i>Portulaca suffrutescens</i>	0-2	-
	orange fameflower	PHAU13	<i>Phemeranthus aurantiacus</i>	0-2	-
	ivyleaf groundcherry	PHHE4	<i>Physalis hederifolia</i>	0-2	-
	jewels of Opar	TAPA2	<i>Talinum paniculatum</i>	0-2	-
	New Mexico fanpetals	SINE	<i>Sida neomexicana</i>	0-2	-
	silverleaf nightshade	SOEL	<i>Solanum elaeagnifolium</i>	0-2	-
	twinleaf senna	SEBA3	<i>Senna bauhinioides</i>	0-2	-
	New Mexico silverbush	ARNE2	<i>Argythamnia neomexicana</i>	0-2	-
	Palmer's Indian mallow	ABPA	<i>Abutilon palmeri</i>	0-2	-
	dwarf desertpeony	ACNA2	<i>Acourtia nana</i>	0-2	-
	lyreleaf greeneyes	BELY	<i>Berlandiera lyrata</i>	0-2	-
	Watson's dutchman's pipe	ARWA	<i>Aristolochia watsonii</i>	0-2	-
	desert larkspur	DEPA	<i>Delphinium parishii</i>	0-2	-
6	<b>Annual forbs</b>			20-450	
	carelessweed	AMPA	<i>Amaranthus palmeri</i>	1-100	-
	bristly fiddleneck	AMTE3	<i>Amsinckia tessellata</i>	1-100	-
	western tansymustard	DEPI	<i>Descurainia pinnata</i>	1-50	-
	goosefoot	CHENO	<i>Chenopodium</i>	1-50	-
	longleaf false goldeneye	HELOA2	<i>Heliomeris longifolia</i> var. <i>annua</i>	1-50	-
	longleaf false goldeneye	HELOL	<i>Heliomeris longifolia</i> var. <i>longifolia</i>	0-50	-

camphorweed	HESU3	<i>Heterotheca subaxillaris</i>	0–50	–
Thurber's morning-glory	IPTH	<i>Ipomoea thurberi</i>	0–50	–
sensitive partridge pea	CHNI2	<i>Chamaecrista nictitans</i>	1–35	–
Coulter's spiderling	BOCO2	<i>Boerhavia coulteri</i>	1–35	–
sorrel buckwheat	ERPO4	<i>Eriogonum polycladon</i>	1–30	–
wheelscale saltbush	ATEL	<i>Atriplex elegans</i>	0–25	–
fewflower beggarticks	BILE	<i>Bidens leptocephala</i>	1–25	–
slender goldenweed	MAGR10	<i>Machaeranthera gracilis</i>	1–25	–
tanseyleaf tansyaster	MATA2	<i>Machaeranthera tanacetifolia</i>	1–25	–
phacelia	PHACE	<i>Phacelia</i>	1–25	–
shaggyfruit pepperweed	LELA	<i>Lepidium lasiocarpum</i>	1–20	–
intermediate pepperweed	LEVIM	<i>Lepidium virginicum var. medium</i>	1–20	–
hoary bowlesia	BOIN3	<i>Bowlesia incana</i>	0–20	–
New Mexico thistle	CINE	<i>Cirsium neomexicanum</i>	1–20	–
cryptantha	CRYPT	<i>Cryptantha</i>	1–20	–
common sunflower	HEAN3	<i>Helianthus annuus</i>	0–20	–
woolly tidestromia	TILA2	<i>Tidestromia lanuginosa</i>	0–20	–
crestrub morning-glory	IPCO2	<i>Ipomoea costellata</i>	0–15	–
New Mexico copperleaf	ACNE	<i>Acalypha neomexicana</i>	1–15	–
American wild carrot	DAPU3	<i>Daucus pusillus</i>	1–10	–
California poppy	ESCAM	<i>Eschscholzia californica ssp. mexicana</i>	0–10	–
horseweed	CONYZ	<i>Conyza</i>	0–10	–
Florida pellitory	PAFL3	<i>Parietaria floridana</i>	0–10	–
whitestem blazingstar	MEAL6	<i>Mentzelia albicaulis</i>	0–10	–
sweet four o'clock	MILO2	<i>Mirabilis longiflora</i>	0–10	–
phlox	PHLOX	<i>Phlox</i>	0–10	–
Arizona popcornflower	PLAR	<i>Plagiobothrys arizonicus</i>	0–10	–
woolly plantain	PLPA2	<i>Plantago patagonica</i>	1–10	–
purslane	PORTU	<i>Portulaca</i>	0–10	–
chia	SACO6	<i>Salvia columbariae</i>	0–10	–
sawtooth sage	SASU7	<i>Salvia subincisa</i>	0–10	–
ragwort	SENEC	<i>Senecio</i>	0–10	–
streamside bur cucumber	SIAM	<i>Sicyos ampelophyllus</i>	0–10	–
sleepy silene	SIAN2	<i>Silene antirrhina</i>	1–10	–
climbing arrowheads	SIGR	<i>Sicyosperma gracile</i>	0–10	–
cutleaf bur cucumber	SILA	<i>Sicyos laciniatus</i>	0–10	–
combseed	PECTO	<i>Pectocarya</i>	0–10	–
manybristle chinchweed	PEPA2	<i>Pectis papposa</i>	0–5	–
golden crownbeard	VEEN	<i>Verbesina encelioides</i>	0–5	–
sand fringe pod	THCU	<i>Thysanocarpus curvipes</i>	0–5	–
spreading fanpetals	SIAB	<i>Sida abutifolia</i>	0–5	–
desert unicorn-plant	PRAL4	<i>Proboscidea althaeifolia</i>	0–5	–
doubleclaw	PRPA2	<i>Proboscidea parviflora</i>	0–5	–

	subshrub		<i>Rafinesquia parviflora</i>	0-5	-
	New Mexico plumeseed	RANE	<i>Rafinesquia neomexicana</i>	0-5	-
	desert Indianwheat	PLOV	<i>Plantago ovata</i>	0-5	-
	minerslettuce	MONTI	<i>Montia</i>	0-5	-
	Nuttall's povertyweed	MONU	<i>Monolepis nuttalliana</i>	0-5	-
	green carpetweed	MOVE	<i>Mollugo verticillata</i>	0-5	-
	Mexican passionflower	PAME2	<i>Passiflora mexicana</i>	0-5	-
	Arizona lupine	LUAR4	<i>Lupinus arizonicus</i>	0-5	-
	Coulter's lupine	LUSP2	<i>Lupinus sparsiflorus</i>	0-5	-
	cutleaf cyclanthera	CYDI	<i>Cyclanthera dissecta</i>	0-5	-
	Palmer's spectaclepod	DICA31	<i>Dimorphocarpa candicans</i>	0-5	-
	wedgeleaf draba	DRCU	<i>Draba cuneifolia</i>	0-5	-
	sanddune wallflower	ERCA14	<i>Erysimum capitatum</i>	0-5	-
	lobed tickseed	COAU	<i>Coreopsis auriculata</i>	0-5	-
	scrambled eggs	COAU2	<i>Corydalis aurea</i>	0-5	-
	spurge	EUPHO	<i>Euphorbia</i>	1-5	-
	beeblossom	GAURA	<i>Gaura</i>	0-5	-
	Arizona poppy	KAGR	<i>Kallstroemia grandiflora</i>	0-5	-
	warty caltrop	KAPA	<i>Kallstroemia parviflora</i>	0-5	-
	Gordon's bladderpod	LEGO	<i>Lesquerella gordonii</i>	0-5	-
	southwestern pricklypoppy	ARPL3	<i>Argemone pleiacantha</i>	0-5	-
	milkvetch	ASTRA	<i>Astragalus</i>	0-5	-
	star gilia	GIST	<i>Gilia stellata</i>	0-2	-
	blanketflower	GAILL	<i>Gaillardia</i>	0-2	-
	Texas stork's bill	ERTE13	<i>Erodium texanum</i>	0-2	-
	fringed redmaids	CACI2	<i>Calandrinia ciliata</i>	0-2	-
	Fendler's desertydandelion	MAFE	<i>Malacothrix fendleri</i>	0-2	-
	foothill deervetch	LOHU2	<i>Lotus humistratus</i>	0-2	-
	coastal bird's-foot trefoil	LOSAB	<i>Lotus salsuginosus var. brevivexillus</i>	0-2	-
	Lemmon's linanthus	LELE29	<i>Leptosiphon lemmonii</i>	0-2	-
	desert evening primrose	OEPR	<i>Oenothera primiveris</i>	0-2	-
	rough cocklebur	XAST	<i>Xanthium strumarium</i>	0-2	-

#### Shrub/Vine

7	<b>Riverwash shrubs</b>			25-150	
	rubber rabbitbrush	ERNAL	<i>Ericameria nauseosa ssp. consimilis var. leiosperma</i>	0-100	-
	singlewhorl burrobrush	HYMO	<i>Hymenoclea monogyra</i>	1-100	-
	clasping milkweed	ASAM	<i>Asclepias amplexicaulis</i>	3-38	-
	fingerleaf gourd	CUDI	<i>Cucurbita digitata</i>	3-38	-
	Missouri gourd	CUFO	<i>Cucurbita foetidissima</i>	3-38	-
	coyote gourd	CUPA	<i>Cucurbita palmata</i>	3-38	-
	pricklyburr	DAIN2	<i>Datura inoxia</i>	3-38	-
	Gila manroot	MAGI	<i>Marah gilensis</i>	3-38	-

	doubleclaw	PRPA2	<i>Proboscidea parviflora</i>	3–38	–
	ambrosia leaf bur ragweed	AMAM2	<i>Ambrosia ambrosioides</i>	0–25	–
	desertbroom	BASA2	<i>Baccharis sarothroides</i>	1–20	–
	mule-fat	BASA4	<i>Baccharis salicifolia</i>	0–20	–
	burroweed	ISTE2	<i>Isocoma tenuisecta</i>	1–20	–
	sweetbush	BEJU	<i>Bebbia juncea</i>	0–15	–
8	<b>Miscellaneous Shrubs</b>			50–150	
	spiny hackberry	CEEH	<i>Celtis ehrenbergiana</i>	0–100	–
	fringed twinevine	FUCYC	<i>Funastrum cynanchoides</i> ssp. <i>cynanchoides</i>	1–25	–
	desert-thorn	LYCIU	<i>Lycium</i>	1–25	–
	whitethorn acacia	ACCO2	<i>Acacia constricta</i>	0–25	–
	lotebush	ZIOB	<i>Ziziphus obtusifolia</i>	1–25	–
	littleleaf sumac	RHMI3	<i>Rhus microphylla</i>	0–25	–
	Thurber's desert honeysuckle	ANTH2	<i>Anisacanthus thurberi</i>	0–20	–
	fourwing saltbush	ATCA2	<i>Atriplex canescens</i>	0–20	–
	Drummond's clematis	CLDR	<i>Clematis drummondii</i>	1–20	–
	Apache plume	FAPA	<i>Fallugia paradoxa</i>	0–20	–
	desert olive	FOSH	<i>Forestiera shrevei</i>	0–15	–
	Coulter's brickellbush	BRCO	<i>Brickellia coulteri</i>	0–15	–
	knifeleaf condalia	COSP3	<i>Condalia spathulata</i>	0–15	–
	Warnock's snakewood	COWA	<i>Condalia warnockii</i>	0–15	–
	Kearney's snakewood	COWAK	<i>Condalia warnockii</i> var. <i>kearneyana</i>	0–10	–
	shortleaf baccharis	BABR	<i>Baccharis brachyphylla</i>	0–10	–
	fairyduster	CAER	<i>Calliandra eriophylla</i>	0–10	–
	longleaf jointfir	EPTR	<i>Ephedra trifurca</i>	0–10	–
	bastardsage	ERWR	<i>Eriogonum wrightii</i>	0–10	–
	California brickellbush	BRCA3	<i>Brickellia californica</i>	0–10	–
	skunkbush sumac	RHTR	<i>Rhus trilobata</i>	0–10	–
	threadleaf ragwort	SEFLF	<i>Senecio flaccidus</i> var. <i>flaccidus</i>	0–10	–
	Texas mulberry	MOMI	<i>Morus microphylla</i>	0–10	–
	sacahuista	NOMI	<i>Nolina microcarpa</i>	0–10	–
	canyon grape	VIAR2	<i>Vitis arizonica</i>	0–10	–
	soaptree yucca	YUEL	<i>Yucca elata</i>	1–10	–
	Parish's goldeneye	VIPA14	<i>Viguiera parishii</i>	0–5	–
	banana yucca	YUBA	<i>Yucca baccata</i>	0–5	–
	cactus apple	OPEN3	<i>Opuntia engelmannii</i>	0–5	–
	Thurber's sandpaper plant	PETH4	<i>Petalonyx thurberi</i>	0–5	–
	Schott's yellowhood	NISC	<i>Nissolia schottii</i>	0–5	–
	American threefold	TRCA8	<i>Trixis californica</i>	0–5	–
	catclaw mimosa	MIACB	<i>Mimosa aculeaticarpa</i> var. <i>biuncifera</i>	0–5	–
	velvetpod mimosa	MIDY	<i>Mimosa dysocarpa</i>	0–5	–

	sorreivine	CHKZ	<i>Cissus tripartita</i>	0-5	-
	Wright's beebrush	ALWR	<i>Aloysia wrightii</i>	0-5	-
	yerba de pasmo	BAPT	<i>Baccharis pteronioides</i>	0-5	-
	Palmer's century plant	AGPA3	<i>Agave palmeri</i>	0-2	-
	Arizona pencil cholla	CYAR14	<i>Cylindropuntia arbuscula</i>	0-2	-
	Christmas cactus	CYLE8	<i>Cylindropuntia leptocaulis</i>	0-2	-
	walkingstick cactus	CYSP8	<i>Cylindropuntia spinosior</i>	0-2	-
	staghorn cholla	CYVE3	<i>Cylindropuntia versicolor</i>	0-2	-
	common sotol	DAWH2	<i>Dasyilirion wheeleri</i>	0-2	-
	broom snakeweed	GUSA2	<i>Gutierrezia sarothrae</i>	0-2	-
	candy barrelcactus	FEWI	<i>Ferocactus wislizeni</i>	0-2	-
<b>Tree</b>					
9	<b>Dominant trees</b>			300-800	
	mesquite	PROSO	<i>Prosopis</i>	200-500	-
	catclaw acacia	ACGR	<i>Acacia greggii</i>	50-200	-
	blue paloverde	PAFL6	<i>Parkinsonia florida</i>	0-100	-
	netleaf hackberry	CELAR	<i>Celtis laevigata var. reticulata</i>	0-50	-
	desert willow	CHLI2	<i>Chilopsis linearis</i>	0-50	-
	Jerusalem thorn	PAAC3	<i>Parkinsonia aculeata</i>	0-50	-
	velvet ash	FRVE2	<i>Fraxinus velutina</i>	0-25	-
	Arizona walnut	JUMA	<i>Juglans major</i>	0-25	-
	western soapberry	SASAD	<i>Sapindus saponaria var. drummondii</i>	0-25	-
	American black elderberry	SANIC4	<i>Sambucus nigra ssp. canadensis</i>	0-20	-
	Arizona sycamore	PLWR2	<i>Platanus wrightii</i>	0-15	-
	narrowleaf willow	SAEX	<i>Salix exigua</i>	0-15	-
	Fremont cottonwood	POFR2	<i>Populus fremontii</i>	0-10	-
	oneseed juniper	JUMO	<i>Juniperus monosperma</i>	0-10	-

## Animal community

This site produces a wide variety of good quality forage and is usable at any season by all classes of cattle. It usually occurs as small inclusions within large areas of upland range sites. Having a good variety of forage species, shade, and occasional water, this site will be overused in the summer growing season before proper use is made of adjacent upland areas. For this reason, grazing systems must be used to allow recovery of herbaceous forage species on this site. The site produces a good variety of valuable browse for spring and fall use.

Occurring as occasional wooded strips through large areas of open uplands, this site is a haven for wildlife, especially in the heat of the summer season. Water is available occasionally in the spring and again in the summer. Water developments are very important for wildlife species using this site.

## Hydrological functions

These sandy floodplains are extremely important for ground-water recharge in upland basins. Deep, very coarse textured soils allow water to percolate to great depths after runoff from large storms.

## Recreational uses

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

## Wood products

Mesquite and catclaw acacia furnish limited fuel-wood and posts. The importance of large trees on this site for wildlife should limit the fuel-wood uses to deadwood and driftwood.

## Other products

Sand, magnetite.

## Inventory data references

Range 417s include 1 in excellent condition, 1 in good condition and 4 in poor condition.

## Type locality

Location 1: Pima County, AZ	
Township/Range/Section	T20S R8E S16
General legal description	Santa Margarita Ranch
Location 2: Pima County, AZ	
Township/Range/Section	T18S R17E S36
General legal description	Empire ranch at KA #20 in lower Mattie canyon.
Location 3: Pima County, AZ	
Township/Range/Section	T21S R8E S24
General legal description	Buenos Aires Nat. Wildlife Refuge
Location 4: Pima County, AZ	
Township/Range/Section	T18S R14E S36
General legal description	Santa Rita Experimental Range, bottom of Box canyon east of road # 486.

## Contributors

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Unknown

## Rangeland health reference sheet

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

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

## Indicators

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

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

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

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

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

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

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

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

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

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

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

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

Dominant:

Sub-dominant:

Other:

Additional:



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

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

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

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

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17. **Perennial plant reproductive capability:**

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