

Ecological site R041XB209AZ Loamy Swale 8-12" 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): 041X–Madrean Archipelago

AZ 41.2 - Chihuahuan - Sonoran Desert Shrubs

Elevations range from 2600 to 4000 feet and precipitation ranges from 8 to 12 inches per year. Vegetation includes mesquite, palo verde, catclaw acacia, soaptree yucca, creosotebush, whitethorn, staghorn cholla, desert saltbush, Mormon tea, burroweed, snakeweed, tobosa, black grama, threeawns, bush muhly, dropseed, and burrograss. The soil temperature regime is thermic and the soil moisture regime is typic aridic. This unit occurs within the Basin and Range Physiographic Province and is characterized by numerous mountain ranges that rise abruptly from broad, plain-like valleys and basins. Igneous and metamorphic rock classes dominate the mountain ranges and sediments filling the basins represent combinations of fluvial, lacustrine, colluvial and alluvial deposits.

Associated sites

R041XB207AZ	Limy Slopes 8-12" p.z.
R041XB208AZ	Limy Upland 8-12" p.z.
R041XB213AZ	Sandy Wash 8-12" p.z.
R041XB216AZ	Clayey Slopes 8-12" p.z.

Similar sites

R041XC302AZ	Clayey Swale 12-16" p.z.
R041XA114AZ	Loamy Bottom 16-20" p.z.

Table 1. Dominant plant species

Tree	(1) Prosopis glandulosa var. torreyana	
Shrub	Not specified	
Herbaceous	(1) sporobolus wrightii	

Physiographic features

This site occurs in the lowest elevations of the Madrean Basin and Range province in southeastern Arizona. It occurs on floodplains and low stream terraces of first and second order tributaries of major stream systems. It benefits on a regular basis from extra moisture received as over-bank flooding. It lacks any water table within the reach of mesquite roots.

Table 2. Representative physiographic features

Landforms	(1) Flood plain(2) Stream terrace
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	2,600–4,000 ft
Slope	0–3%
Aspect	Aspect is not a significant factor

Climatic features

Precipitation ranges from 8-12 inches annually. More than half falls during Jul-Sep in brief, but often heavy, thunderstorms. The rest of the moisture comes as light rain or snow that falls slowly for a day or more, but rarely lasts more than a day. May and June are normally the driest months. Humidity is generally very low.

Temperatures are mild throughout most of the year. Freezing temperatures are common at night Dec-Feb; brief 0 F may be observed some nights. During June, July & August, some days may exceed 100 F.

In years of average or greater winter precipitation, annual grasses and forbs occur abundantly in the interspaces.

Table 3. Representative climatic features

Frost-free period (average)	240 days
Freeze-free period (average)	0 days
Precipitation total (average)	0 in

Influencing water features

There are no water features associated with this site.

Soil features

These are young soils on loamy to clayey alluvium of mixed origin. They are deep and moderately dark colored. Plant-soil moisture relationships are excellent.

Soils mapped on this site include: SSA-662 Safford area MU's Ac & Ag Agua, AhA Anthony, GgA Gila and Pm Pima; SSA-664 San Simon area MU's 1 & 24 Gila, 24 Glendale, 33 & 34 Pima and 34 Grabe; SSA-666 Cochise county Northwest part MU 42 Glendale; SSA-671 Cochise county Douglas-Tombstone part MU's 36 Ugyp and 111 Ugyp stream terraces.

Surface texture	(1) Fine sandy loam(2) Silt loam(3) Loam
Family particle size	(1) Loamy
Drainage class	Well drained
Permeability class	Moderately slow to slow
Soil depth	60 in
Surface fragment cover <=3"	0–10%
Surface fragment cover >3"	0–1%
Available water capacity (0-40in)	5.8–10.8 in
Calcium carbonate equivalent (0-40in)	0–10%
Electrical conductivity (0-40in)	0–4 mmhos/cm
Sodium adsorption ratio (0-40in)	0–6
Soil reaction (1:1 water) (0-40in)	7–8.2
Subsurface fragment volume <=3" (Depth not specified)	0–5%
Subsurface fragment volume >3" (Depth not specified)	0–1%

Table 4. Representative soil features

Ecological dynamics

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

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

NRCS uses a Similarity Index to compare existing plant communities to the plant communities described here. Similarity index is determined by comparing the production and composition of a plant community to the production and composition of a plant community described in this site description. To determine Similarity index, compare the production (air dry weight) of each species to that shown in the plant community description. For each species, count no more than the maximum amount shown for the species, and for each group, count no more than the maximum amount shown for the 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

MLRA 41-2 (8-12"), Loamy Swale

State and transition model



and gully erosion. Persistent reduced infiltration, greatly increased 2a. CHG, introduction of a seed source. Direct or indirect seeding Base level changes in main stream causes downcutting in swales. 1b. Herbicide or mechanical means to remove mesquite. PG/NG 4b. Mechanical/herbicide treatment of shrubs, PG/NG, seeding a. CHG to open up grass cover. Distribution of seed source of nunoff, and very limited recruitment of perennial grasses. Base Reduction of A horizon OM and litter, compaction, sheet, rill planting of native grasses, maintenance treatments for shrubs, 3a. CHG (managing for annuals), repeated burning plus CHG 2b. Herbicide treatment of exotics, Seeding of native grasses 4a. CHG coupled with drought and burning, low grass cover, Severe soil compaction from traffic (livestock or equipment) mesquite by livestock. Lack of fire for long periods of time. 3b. PG/NG, seeding or planting of native perennial grasses. Reduction of A horizon OM and litter, compaction, greatly 5a. CHG, internuption of overland flow, diversion of nunoff, level change in main stream causes downcutting in swales. Hay mowing, cultivation for irrigation and abandonment. (hay feeding) of exotics like bermuda or Johnson grass. 5b. Mechanical control of nills and gullies. PG/NG Mechanical control of sheet, rill and gully erosion. Soil ripping, contouring and / or mulching reduced infiltration, increased nunoff

PG/NG - proper grazing, no grazing CHG - continuous heavy grazing

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.



Figure 4. State and Transition, Loamy Swales 8-12" p.z.

State 1 Historic Climax Plant Community

Community 1.1 Historic Climax Plant Community

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 plant community represents the natural climax community that eventually re-occupies the site with proper management. The potential plant community is dominated by western honey mesquite and giant sacaton and other grasses. Periodic flooding accounts for very productive stands of trees and grass. Naturally occurring fires, June thru August, were an important factor in maintaining the plant community on this site. Mesquite can increase to dominate the native plant community in the absence of high intensity fires. Sediment accumulation around the stem bases of established mesquite can occur with flooding. Even repeated fires will not remove established mesquite if their bud zones are buried by sediment.

Table 5. Annual production by plant type

Plant Type	Low (Lb/Acre)	Representative Value (Lb/Acre)	High (Lb/Acre)
Grass/Grasslike	535	1500	2100
Tree	200	400	600
Forb	20	100	350
Shrub/Vine	1	20	50
Total	756	2020	3100

Table 6. Soil surface cover

Tree basal cover	1%
Shrub/vine/liana basal cover	0-1%
Grass/grasslike basal cover	10-15%
Forb basal cover	0-2%
Non-vascular plants	0%
Biological crusts	1-20%
Litter	10-50%
Surface fragments >0.25" and <=3"	0-5%
Surface fragments >3"	0-1%
Bedrock	0%
Water	0%
Bare ground	10-80%

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

State 2 Annuals

Community 2.1 Annuals

Some areas of this state have been created by cultivation for irrigated farming and subsequent abandonment. Former cultivated areas usually have been altered by the diversion of floodwaters with dikes or drainage ditches. In other areas mesquite has been cleared or harvested and annual species dominate. Native and non-native annual forbs and grasses dominate the plant community with minor amounts of other native and non-native perennial grasses.

State 3 Mesquite, eroded

Community 3.1 Mesquite, eroded



Figure 6. Loamy Swale 8-12" pz. eroded

The down-cutting of major stream systems and subsequent "valley side" gullying have left many areas of this state in and along second order tributaries. The site no longer benefits from flooding. The plant community is dominated by mature mesquite trees with little or no perennial under-story. This state is not recognized as a mesquite woodland site. Usually canopy cover is less than 30% and groundwater is too deep for mesquite roots to reach it and allow the formation of bosques. Maximum height of mesquite on this site (in this state) is about 20 feet.

Exotic grasses and forbs

Community 4.1 Exotic grasses and forbs

This state exists where non-native grasses and forbs dominate the under-story with mesquite canopy. Grasses include bermuda, Johnson grass, red brome, foxtail barley and barnyard grass. Forbs include London rocket, filaree, purslane, tumbleweed and cheeseweed. These species may affect the native flora of grasses and forbs negatively by reducing the seed bank of annuals and direct competition with perennials.

State 5 Mesquite, natives

Community 5.1 Mesquite, natives



Figure 7. Loamy Swale 8-12" pz. mesquite

This state occurs where mesquite has increased in canopy cover and density to dominate the site. Mesquite canopy ranges from 5 to 20%. Native perennial and annual grasses and forbs dominate the under-story.

Additional community tables

Table 8. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Lb/Acre)	Foliar Cover (%)
Grass	/Grasslike				
1	Dominant perennial gra	isses		500–1800	
	big sacaton	SPWR2	Sporobolus wrightii	200–1000	-
	sideoats grama	BOCU	Bouteloua curtipendula	100–400	-
	bush muhly	MUPO2	Muhlenbergia porteri	100–300	-
	vine mesquite	PAOB	Panicum obtusum	100–300	-
	alkali sacaton	SPAI	Sporobolus airoides	0–150	-
	whiplash pappusgrass	PAVA2	Pappophorum vaginatum	25–100	-
	tobosagrass	PLMU3	Pleuraphis mutica	0–50	-
2	miscellaneous perennia	al grasses		25–150	
	cane bluestem	BOBA3	Bothriochloa barbinodis	10–50	-
	spidergrass	ARTE3	Aristida ternipes	10–30	-
	Arizona cottontop	DICA8	Digitaria californica	0–25	_
	squirreltail	ELELE	Elymus elymoides ssp. elymoides	0–25	_

	green sprangletop	LEDU	Leptochloa dubia	0–25	_
	plains bristlegrass	SEVU2	Setaria vulpiseta	5–25	_
	creeping muhly	MURE	Muhlenbergia repens	0–15	_
	spidergrass	ARTEG	Aristida ternipes var. gentilis	0–15	_
	flatsedge	CYPER	Cyperus	0–15	_
	Parish's threeawn	ARPUP5	Aristida purpurea var. parishii	0–15	_
	purple threeawn	ARPU9	Aristida purpurea	0–10	_
	tanglehead	HECO10	Heteropogon contortus	0–10	_
	spike dropseed	SPCO4	Sporobolus contractus	0–10	_
	sand dropseed	SPCR	Sporobolus cryptandrus	0–5	_
	burrograss	SCBR2	Scleropogon brevifolius	0–5	_
3	Annual grasses			10–150	
	feather fingergrass	CHVI4	Chloris virgata	0–50	_
	mucronate sprangeltop	LEPAB	Leptochloa panicea ssp. brachiata	0–25	_
	Mexican panicgrass	PAHI5	Panicum hirticaule	0–25	_
	Arizona signalgrass	URAR	Urochloa arizonica	0–25	-
	sixweeks fescue	VUOC	Vulpia octoflora	0–25	_
	needle grama	BOAR	Bouteloua aristidoides	0–20	_
	tapertip cupgrass	ERACA	Eriochloa acuminata var. acuminata	0–15	_
	Mexican sprangletop	LEFUU	Leptochloa fusca ssp. uninervia	0–10	_
	sixweeks grama	BOBA2	Bouteloua barbata	0–5	_
	Arizona brome	BRAR4	Bromus arizonicus	0–5	_
	Bigelow's bluegrass	POBI	Poa bigelovii	0–5	_
	sticky sprangletop	LEVI5	Leptochloa viscida	0–5	_
	delicate muhly	MUFR	Muhlenbergia fragilis	0–5	_
	littleseed muhly	MUMI	Muhlenbergia microsperma	0–5	_
	witchgrass	PACA6	Panicum capillare	0–5	_
	Mexican lovegrass	ERME	Eragrostis mexicana	0–5	_
	desert lovegrass	ERPEM	Eragrostis pectinacea var. miserrima	0–5	_
	tufted lovegrass	ERPEP2	Eragrostis pectinacea var. pectinacea	0–5	_
	sixweeks threeawn	ARAD	Aristida adscensionis	0–5	_
	prairie threeawn	AROL	Aristida oligantha	0–5	_
Forb					
4	Perennial forbs			10–50	
	Missouri gourd	CUFO	Cucurbita foetidissima	0–50	_
	coyote gourd	CUPA	Cucurbita palmata	0–25	_
	weakleaf bur ragweed	AMCO3	Ambrosia confertiflora	1–25	_
	fingerleaf gourd	CUDI	Cucurbita digitata	0–25	_
	scarlet spiderling	BOCO	Boerhavia coccinea	0–15	_
	spreading fleabane	ERDI4	Erigeron divergens	0–10	_
	canaigre dock	RUHY	Rumex hymenosepalus	0–10	_
	Indian rushpea	HOGL2	Hoffmannseggia glauca	0–10	_
	desert globemallow	SPAM2	Sphaeralcea ambigua	0–10	_
	spear globemallow	SPHA	Sphaeralcea hastulata	0–10	_

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	brownplume wirelettuce	STPA4	Stephanomeria pauciflora	0–5	
	Louisiana vetch	VILUL2	Vicia ludoviciana ssp. ludoviciana	0–5	_
	Trans-Pecos thimblehead	HYWI	Hymenothrix wislizeni	0–5	_
	beeblossom	GAURA	Gaura	0–5	_
	southwestern mock vervain	GLGO	Glandularia gooddingii	0–5	_
	small matweed	GUDED	Guilleminea densa var. densa	0–5	_
	silverleaf nightshade	SOEL	Solanum elaeagnifolium	0–5	-
	Missouri goldenrod	SOMI2	Solidago missouriensis	0–5	_
	Wright's cudweed	PSCAC2	Pseudognaphalium canescens ssp. canescens	0–5	-
	ivyleaf groundcherry	PHHE4	Physalis hederifolia	0–2	-
	wild dwarf morning- glory	EVAR	Evolvulus arizonicus	0–2	-
	whitemouth dayflower	COER	Commelina erecta	0–2	-
	milkweed	ASCLE	Asclepias	0–1	_
5	Annual forbs			10–300	
	sedge	CAREX	Carex	50–250	_
	flatsedge	CYPER	Cyperus	50–250	
	slimleaf sneezeweed	HELI	Helenium linifolium	50–250	_
	rush	JUNCU	Juncus	50–250	_
	carelessweed	AMPA	Amaranthus palmeri	0–50	_
	western tansymustard	DEPI	Descurainia pinnata	0–50	-
	camphorweed	HESU3	Heterotheca subaxillaris	0–50	_
	ivyleaf morning-glory	IPHE	Ipomoea hederacea	0–25	_
	sensitive partridge pea	CHNI2	Chamaecrista nictitans	0–25	_
	New Mexico thistle	CINE	Cirsium neomexicanum	0–25	_
	wheelscale saltbush	ATEL	Atriplex elegans	0–25	_
	Coulter's spiderling	BOCO2	Boerhavia coulteri	0–25	_
	Wright's saltbush	ATWR	Atriplex wrightii	0–15	_
	horseweed	CONYZ	Conyza	0–15	_
	cryptantha	CRYPT	Cryptantha	0–15	_
	Arizona poppy	KAGR	Kallstroemia grandiflora	0–15	_
	crestrib morning-glory	IPCO2	Ipomoea costellata	0–15	_
	redstar	IPCO3	Ipomoea coccinea	0–15	_
	intermediate pepperweed	LEVIM	Lepidium virginicum var. medium	0–15	_
	Arizona popcornflower	PLAR	Plagiobothrys arizonicus	0–15	
	Nuttall's povertyweed	MONU	Monolepis nuttalliana	0–15	_
	common sunflower	HEAN3	Helianthus annuus	0–10	_
	longleaf false goldeneye	HELOA2	Heliomeris longifolia var. annua	0–10	_
	longleaf false goldeneye	HELOL	Heliomeris longifolia var. longifolia	0–5	_
	scrambled eggs	COAU2	Corydalis aurea	0–5	_

	California poppy	ESCAM	Eschscholzia californica ssp. mexicana	0–5	_	
	spurge	EUPHO	Euphorbia	0–5	-	
	Arizona blanketflower	GAAR2	Gaillardia arizonica	0–5	_	
	goosefoot	CHENO	Chenopodium	0–5	_	
	shaggyfruit pepperweed	LELA	Lepidium lasiocarpum	0–5	_	
	warty caltrop	KAPA	Kallstroemia parviflora	0–5	_	
	desert Indianwheat	PLOV	Plantago ovata	0–5	_	
	purslane	PORTU	Portulaca	0–5	-	
	desert unicorn-plant	PRAL4	Proboscidea althaeifolia	0–5	-	
	doubleclaw	PRPA2	Proboscidea parviflora	0–5	-	
	Florida pellitory	PAFL3	Parietaria floridana	0–5	-	
	combseed	PECTO	Pectocarya	0–5	-	
	phacelia	PHACE	Phacelia	0–5	-	
	phlox	PHLOX	Phlox	0–5	-	
	foothill deervetch	LOHU2	Lotus humistratus	0–5	-	
	coastal bird's-foot trefoil	LOSAB	Lotus salsuginosus var. brevivexillus	0–5	-	
	Arizona lupine	LUAR4	Lupinus arizonicus	0–5	-	
	Coulter's lupine	LUSP2	Lupinus sparsiflorus	0–5	-	
	slender goldenweed	MAGR10	Machaeranthera gracilis	0–5	-	
	tanseyleaf tansyaster	MATA2	Machaeranthera tanacetifolia	0–5	-	
	whitestem blazingstar	MEAL6	Mentzelia albicaulis	0–5	-	
	American wild carrot	DAPU3	Daucus pusillus	0–5	-	
	jimsonweed	DAST	Datura stramonium	0–5	-	
	sacred thorn-apple	DAWR2	Datura wrightii	0–5	-	
	miniature woollystar	ERDI2	Eriastrum diffusum	0–5	-	
	sorrel buckwheat	ERPO4	Eriogonum polycladon	0–5	-	
	hoary bowlesia	BOIN3	Bowlesia incana	0–5	-	
	southwestern pricklypoppy	ARPL3	Argemone pleiacantha	0–5	-	
	milkvetch	ASTRA	Astragalus	0–5	-	
	golden crownbeard	VEEN	Verbesina encelioides	0–5	-	
	rough cocklebur	XAST	Xanthium strumarium	0–5	-	
	chia	SACO6	Salvia columbariae	0–5	-	
	sawtooth sage	SASU7	Salvia subincisa	0–5	-	
	spreading fanpetals	SIAB	Sida abutifolia	0–5	-	
	sleepy silene	SIAN2	Silene antirrhina	0–3	-	
	New Mexico plumeseed	RANE	Rafinesquia neomexicana	0–3	-	
	Goodding's bladderpod	LEGO2	Lesquerella gooddingii	0–2	-	
	star gilia	GIST	Gilia stellata	0–2	_	
	fringed redmaids	CACI2	Calandrinia ciliata	0–2	_	
	Texas stork's bill	ERTE13	Erodium texanum	0–2	_	
	woolly tidestromia	TILA2	Tidestromia lanuginosa	0–2	_	
	green carpetweed	MOVE	Mollugo verticillata	0–2	_	
Shrub/Vine						

6	Miscellaneous shrubs	1–50					
	catclaw acacia	ACGR	Acacia greggii	0–10	-		
	fourwing saltbush	ATCA2	Atriplex canescens	0–10	_		
	pale desert-thorn	LYPA	Lycium pallidum	0–5	_		
	catclaw mimosa	MIACB	Mimosa aculeaticarpa var. biuncifera	0–5	_		
	soaptree yucca	YUEL	Yucca elata	0–5	_		
	Drummond's clematis	CLDR	Clematis drummondii	0–5	_		
	fringed twinevine	FUCYC	Funastrum cynanchoides ssp. cynanchoides	0–5	_		
	broom snakeweed	GUSA2	Gutierrezia sarothrae	0–2	_		
	whitethorn acacia	ACCO2	Acacia constricta	0–2	_		
	lotebush	ZIOB	Ziziphus obtusifolia	0–2	_		
	desertbroom	BASA2	Baccharis sarothroides	0–2	_		
	burroweed	ISTE2	Isocoma tenuisecta	0–2	_		
	singlewhorl burrobrush	НҮМО	Hymenoclea monogyra	0–1	_		
7	Succulents			0–10			
	Christmas cactus	CYLE8	Cylindropuntia leptocaulis	0–2	-		
	walkingstick cactus	CYSP8	Cylindropuntia spinosior	0–2			
	cactus apple	OPEN3	Opuntia engelmannii	0–2	-		
	tulip pricklypear	OPPH	Opuntia phaeacantha	0–2	-		
	candy barrelcactus	FEWI	Ferocactus wislizeni	0–1	-		
Tree							
8	Common trees			200–600			
	western honey mesquite	PRGLT	Prosopis glandulosa var. torreyana	200–500	-		
	velvet mesquite	PRVE	Prosopis velutina	0–100	-		
	catclaw acacia	ACGR	Acacia greggii	0–50	_		
	netleaf hackberry	CELAR	Celtis laevigata var. reticulata	0–10	_		
	desert willow	CHLI2	Chilopsis linearis	0–10	_		

Animal community

Big sacaton begins growth in the spring about the first of April. Other perennial grass species on the site usually green up in July or August with the first summer rains. The site produces abundant forage for year-round use by all classes of livestock.

These bottoms are very important habitat for a variety of birds and small mammals. They are important areas for javalina and mule deer as well. Water developments on this site are very important for both livestock and wildlife.

Hydrological functions

These small floodplains are important in the hydrologic regime of southeastern Arizona stream systems. Intact floodplains can retain floodwaters for 1 to 2 weeks after major flooding events. Channeled or gullied bottomlands often pass the same flood in 1 or 2 days.

Recreational uses

Hunting, bird-watching, hiking, horseback riding, photography.

Wood products

Mesquite furnishes large quantities of fuel-wood and posts.

Other products

Perennial grass seed

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

Indicators

- 1. Number and extent of rills:
- 2. Presence of water flow patterns:
- 3. Number and height of erosional pedestals or terracettes:
- 4. Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):
- 5. Number of gullies and erosion associated with gullies:
- 6. Extent of wind scoured, blowouts and/or depositional areas:

- 7. Amount of litter movement (describe size and distance expected to travel):
- 8. Soil surface (top few mm) resistance to erosion (stability values are averages most sites will show a range of values):
- 9. Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):
- 10. Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:
- 11. Presence and thickness of compaction layer (usually none; describe soil profile features which may be mistaken for compaction on this site):
- 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:

- 13. Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):
- 14. Average percent litter cover (%) and depth (in):
- 15. Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annualproduction):
- 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:

17. Perennial plant reproductive capability: