

# Ecological site R035XD423AZ Breaks 7-11" p.z. Gypsiferous

Accessed: 05/02/2024

## 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.

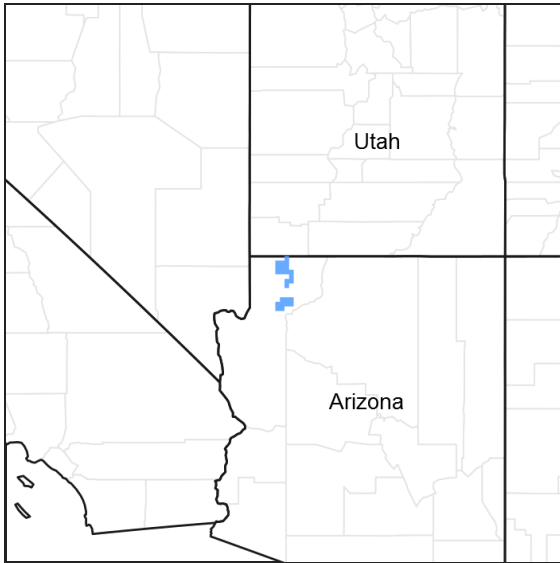


Figure 1. Mapped extent

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): 035X–Colorado Plateau

AZ CRA 35.4 – Colorado Plateau Cold Sagebrush – Grasslands

Elevations range from 4200 to 5100 feet and precipitation averages 7 to 11 inches. Vegetation includes winterfat, fourwing saltbush, buckwheat species, needlegrass, bottlebrush squirreltail, Indian ricegrass, black grama, blue grama, sideoats grama, gyp dropseed, and galleta. The soil temperature regime is mesic and the soil moisture regime is typic aridic. This unit occurs within the Colorado Plateau Physiographic Province and is characterized by a sequence of flat to gently dipping sedimentary rocks eroded into plateaus, valleys and deep canyons. Sedimentary rock classes dominate the plateau with volcanic fields occurring for the most part near its margin.

## Classification relationships

Aspect Differences Near CRA Boundaries:

Hot south and West slopes at lower elevations may more closely resemble the thermic site D30-2 Breaks 9-12" p.z., and production will be significantly lower at all elevations. Cooler north and east slopes are more productive, and at higher elevations will more closely resemble D35-3 Breaks 10-14" p.z.

## Associated sites

R035XD404AZ	<b>Gypsum Hills 7-11" p.z.</b> Gypsum Hills (035XD404AZ)
R035XD405AZ	<b>Gypsum Upland 7-11" p.z.</b> Gypsum Upland (035XD405AZ)
R035XD414AZ	<b>Sandy Loam Upland 7-11" p.z.</b> Shallow Loamy (035XD414AZ)

Table 1. Dominant plant species

Tree	Not specified
Shrub	(1) <i>Ephedra viridis</i> (2) <i>Fallugia paradoxa</i>
Herbaceous	(1) <i>Achnatherum speciosum</i> (2) <i>Achnatherum aridum</i>

## Physiographic features

This desert shrub-grassland site occurs in an upland position. Drainages between the hills derive some benefit from run-on moisture, but most of the site has excessive run-off because of rock outcrop and steep colluvial slopes.

Table 2. Representative physiographic features

Landforms	(1) Escarpment
Flooding frequency	None
Ponding frequency	None
Elevation	1,250–1,615 m
Slope	35–100%
Aspect	N, NE

## Climatic features

Winter-Summer moisture ratios are typically 70:30 on the west side of this LRU and shift to 60:40 on the east side. Late spring is usually the driest period, and early fall moisture can be sporadic. Summer rains fall June-September; moisture originates in the Gulf of Mexico and creates convective, usually brief, intense thunderstorms. Cool season moisture October-May tends to be frontal; it originates in the Pacific and the Gulf of California and falls in widespread storms with longer duration and lower intensity. Precipitation generally comes as snow December-February. Accumulations above 10 inches are not common, but can occur. Snow usually lasts 3-4 days, but can persist much longer. Summer daytime temperatures are commonly 95-100 F and, on occasion, exceed 105F. Winter air temperatures can regularly go below 15 F and have been recorded below -15 F.

Table 3. Representative climatic features

Frost-free period (average)	220 days
Freeze-free period (average)	150 days
Precipitation total (average)	279 mm

## Influencing water features

### Soil features

Soil moisture regime is typic aridic. Temperature regime is mesic. Soils are well-drained with sandy loam and fine

sandy loam textures that are occasionally gravelly. Subsurface textures are sandy loam and fine sandy loam. Water erosion hazard is very severe due to slopes. Wind erosion is slight to high. Plant-soil moisture relationship is poor due to shallow and very shallow soils combined with gypsum content.

Typical taxonomic unit is:

SSA623 Shivwits Area - MU 10 Goblin.

**Table 4. Representative soil features**

Parent material	(1) Alluvium–sandstone and shale
Surface texture	(1) Gravelly sandy loam (2) Fine sandy loam (3) Loam
Family particle size	(1) Loamy
Drainage class	Well drained
Permeability class	Moderately rapid
Soil depth	15–30 cm
Surface fragment cover <=3"	0–15%
Surface fragment cover >3"	0–1%
Available water capacity (0-101.6cm)	0.76–1.52 cm
Calcium carbonate equivalent (0-101.6cm)	5–10%
Electrical conductivity (0-101.6cm)	2–4 mmhos/cm
Sodium adsorption ratio (0-101.6cm)	0–5
Soil reaction (1:1 water) (0-101.6cm)	7.4–7.8
Subsurface fragment volume <=3" (Depth not specified)	0–5%
Subsurface fragment volume >3" (Depth not specified)	0–1%

## Ecological dynamics

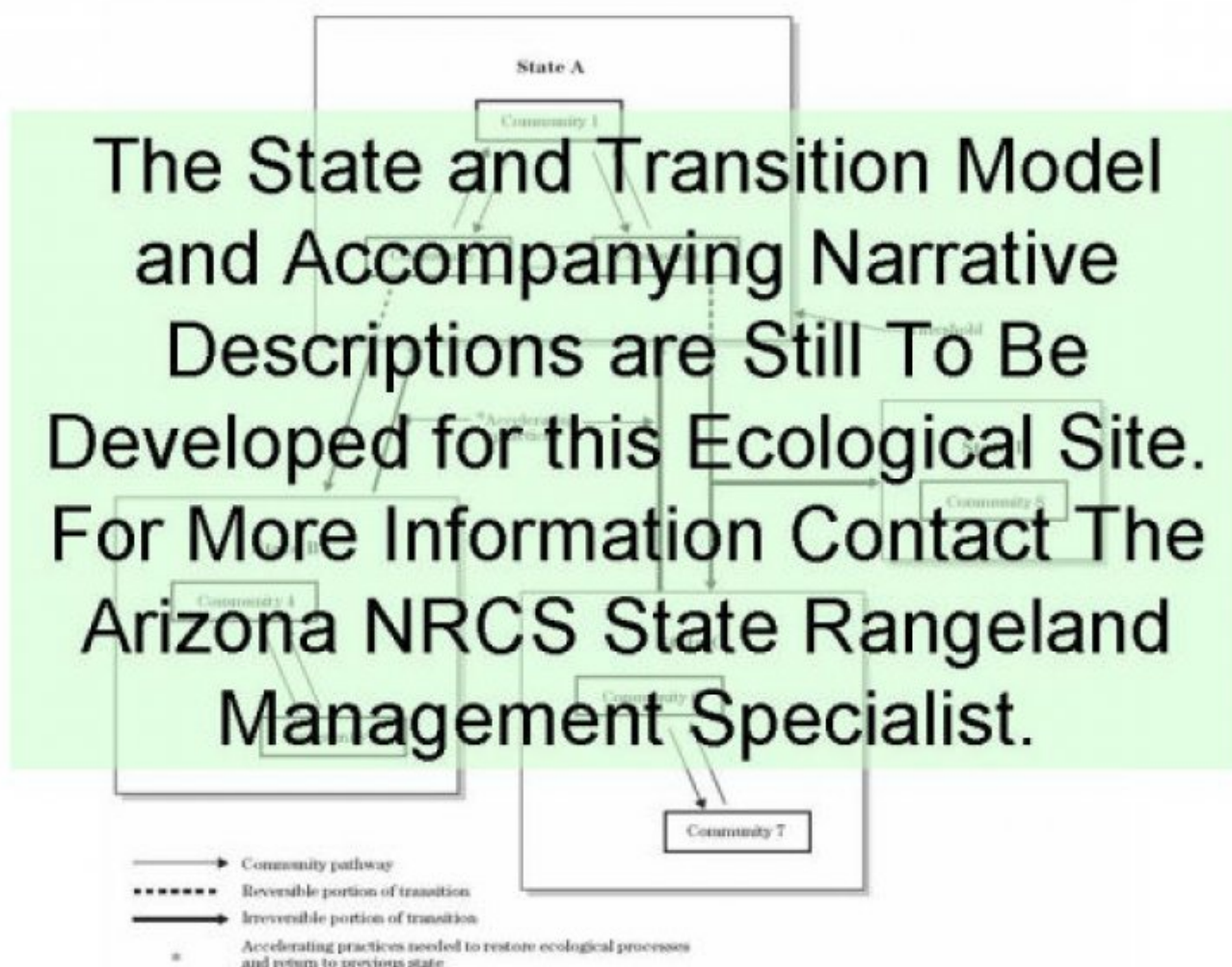
The plant communities found on an ecological site are naturally variable. Composition and production will vary with yearly conditions, location, aspect, and the natural variability of the soils. The Historical Climax Plant Community represents the natural potential plant communities found on relict or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



### State 1

#### Historic Climax Plant Community

#### Community 1.1

#### Historic Climax Plant Community

The aspect of this site can be quite variable, driven by the influence on the soil of remnants of various geologic formations. A thin soil layer of colluvium from limestone and sandstone can result in patches (usually small) of a significant amount of perennial grasses and forbs, chiefly needlegrasses, black grama and Louisiana sagewort. On most of this site, the colluvial deposits have eroded away and the upper layers of the Moenkopi formation are exposed. Widely scattered desert shrubs, ephedra, Apache plume and rabbitbrush, are common, but small amounts of many different shrubs can be found. Perennial plant spacing varies from 0.75-4.0 feet. Extreme slopes, generally wide plant spacing, rock outcrop, undeveloped soil and very limited livestock access indicate this site is quite stable. Fire and grazing influences are not significant. Invading species are limited to small amounts of annuals such as cheatgrass brome. Geologic erosion can be quite high. Rock and talus slides are common. Hot south and west slopes at lower elevations may more closely resemble the thermic site D30-2 Breaks 9-12" pz, and production will be significantly lower at all elevations. Cooler north and east slopes are more productive and at higher elevations will more closely resemble D35-3 Breaks 10-14" pz.

Table 5. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Shrub/Vine	101	168	235
Grass/Grasslike	84	127	168
Forb	7	16	24
Tree	–	2	3
<b>Total</b>	<b>192</b>	<b>313</b>	<b>430</b>

Table 6. Ground cover

Tree foliar cover	0-1%
Shrub/vine/liana foliar cover	2-8%
Grass/grasslike foliar cover	0-2%
Forb foliar cover	0-1%
Non-vascular plants	0%
Biological crusts	0%
Litter	5-15%
Surface fragments >0.25" and <=3"	0-15%
Surface fragments >3"	0%
Bedrock	0%
Water	0%
Bare ground	65-80%

Table 7. Canopy structure (% cover)

Height Above Ground (M)	Tree	Shrub/Vine	Grass/ Grasslike	Forb
<0.15	–	–	–	0-1%
>0.15 <= 0.3	–	–	0-1%	–
>0.3 <= 0.6	–	–	0-1%	–
>0.6 <= 1.4	–	2-8%	–	–
>1.4 <= 4	0-1%	–	–	–
>4 <= 12	–	–	–	–
>12 <= 24	–	–	–	–
>24 <= 37	–	–	–	–
>37	–	–	–	–

Figure 5. Plant community growth curve (percent production by month). AZ0005, 35.4 7-11" p.z. Indian ricegrass. Most growth occurs in the spring, some growth occurs in the fall..

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	0	10	40	40	0	0	0	5	5	0	0

Figure 6. Plant community growth curve (percent production by month). AZ3541, 35.4 7-11" p.z. all sites. Most growth occurs in the spring and during the summer rainy season..

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	1	9	20	15	5	16	25	6	2	1	0

Figure 7. Plant community growth curve (percent production by month). AZ3542, 35.4 7-11" p.z. Needle and thread. Growth occurs mostly in the spring..

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	0	15	60	20	5	0	0	0	0	0	0

Figure 8. Plant community growth curve (percent production by month). AZ3570, 35.4 7-11" p.z. Nevada Mormon tea. Growth occurs mostly in spring and early summer using stored winter moisture..

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	0	5	25	25	20	15	10	0	0	0	0

Figure 9. Plant community growth curve (percent production by month). AZ5215, 35.4 7-11" p.z. black grama. Growth occurs mostly during the summer rainy season..

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	0	0	0	5	5	30	50	10	0	0	0

## Additional community tables

Table 8. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Kg/Hectare)	Foliar Cover (%)
<b>Grass/Grasslike</b>					
0				56–168	
	Mormon needlegrass	ACAR14	<i>Achnatherum aridum</i>	17–50	–
	desert needlegrass	ACSP12	<i>Achnatherum speciosum</i>	17–50	–
	Indian ricegrass	ACHY	<i>Achnatherum hymenoides</i>	10–20	–
	needle and thread	HECOC8	<i>Hesperostipa comata ssp. comata</i>	10–20	–
	spike dropseed	SPCO4	<i>Sporobolus contractus</i>	7–17	–
	sand dropseed	SPCR	<i>Sporobolus cryptandrus</i>	7–17	–
	bush muhly	MUPO2	<i>Muhlenbergia porteri</i>	0–10	–
	squirreltail	ELELE	<i>Elymus elymoides ssp. elymoides</i>	3–10	–
	prairie Junegrass	KOMA	<i>Koeleria macrantha</i>	0–7	–
1				28–84	
	black grama	BOER4	<i>Bouteloua eriopoda</i>	7–20	–
	hairy woollygrass	ERP15	<i>Erioneuron pilosum</i>	7–17	–
	James' galleta	PLJA	<i>Pleuraphis jamesii</i>	3–17	–
	gyp dropseed	SPNE	<i>Sporobolus nealleyi</i>	7–17	–
	slim tridens	TRMU	<i>Tridens muticus</i>	7–17	–
	sideoats grama	BOCU	<i>Bouteloua curtipendula</i>	0–10	–
2				0–10	
	Grass, perennial	2GP	<i>Grass, perennial</i>	0–10	–
	threeawn	ARIST	<i>Aristida</i>	0–10	–
	blue grama	BOGR2	<i>Bouteloua gracilis</i>	0–10	–
	low woollygrass	DAPU7	<i>Dasyochloa pulchella</i>	0–10	–
	wildrye	ELYMU	<i>Elymus</i>	0–10	–
	New Mexico muhly	MUPA2	<i>Muhlenbergia pauciflora</i>	0–10	–

	burrograss	SCBR2	<i>Scleropogon brevifolius</i>	0-10	-
3				0-7	
	hairy woollygrass	ERPI5	<i>Erioneuron pilosum</i>	7-17	-
	spike dropseed	SPCO4	<i>Sporobolus contractus</i>	7-17	-
	sand dropseed	SPCR	<i>Sporobolus cryptandrus</i>	7-17	-
	gyp dropseed	SPNE	<i>Sporobolus nealleyi</i>	7-17	-
	slim tridens	TRMU	<i>Tridens muticus</i>	7-17	-
	Grass, annual	2GA	<i>Grass, annual</i>	0-7	-
	sixweeks grama	BOBA2	<i>Bouteloua barbata</i>	0-7	-
	lovegrass	ERAGR	<i>Eragrostis</i>	0-7	-
	sixweeks fescue	VUOC	<i>Vulpia octoflora</i>	0-7	-
<b>Forb</b>					
0				7-24	
	white sagebrush	ARLU	<i>Artemisia ludoviciana</i>	17-34	-
	fanleaf hawthorn	CRFL	<i>Crataegus flabellata</i>	3-10	-
	Colorado four o'clock	MIMU	<i>Mirabilis multiflora</i>	3-10	-
	little combseed	PEPU	<i>Pectocarya pusilla</i>	3-10	-
	Wright's cliffbrake	PEWR	<i>Pellaea wrightiana</i>	3-10	-
	phlox	PHLOX	<i>Phlox</i>	3-10	-
	globemallow	SPHAE	<i>Sphaeralcea</i>	3-10	-
	Forb, perennial	2FP	<i>Forb, perennial</i>	3-10	-
	desert princesplume	STPI	<i>Stanleya pinnata</i>	0-7	-
4				0-7	
	James' galleta	PLJA	<i>Pleuraphis jamesii</i>	3-17	-
	Forb, annual	2FA	<i>Forb, annual</i>	0-7	-
	aster	ASTER	<i>Aster</i>	0-7	-
	buckwheat	ERIOG	<i>Eriogonum</i>	0-7	-
	spurge	EUPHO	<i>Euphorbia</i>	0-7	-
	blazingstar	MENTZ	<i>Mentzelia</i>	0-7	-
	desert tobacco	NIOBO	<i>Nicotiana obtusifolia var. obtusifolia</i>	0-7	-
	primrose	PRIMU	<i>Primula</i>	0-7	-
<b>Shrub/Vine</b>					
13				7-27	
	Apache plume	FAPA	<i>Fallugia paradoxa</i>	7-27	-
	squirreltail	ELELE	<i>Elymus elymoides ssp. elymoides</i>	3-10	-
14				7-17	
	fourwing saltbush	ATCA2	<i>Atriplex canescens</i>	7-17	-
	yellow rabbitbrush	CHVI8	<i>Chrysothamnus viscidiflorus</i>	7-17	-
	rockjasmine buckwheat	ERAN5	<i>Eriogonum androsaceum</i>	7-17	-
15				7-13	
	broom snakeweed	GUSA2	<i>Gutierrezia sarothrae</i>	7-13	-
16				34-67	
	Torrey's jointfir	EPTO	<i>Ephedra torreyana</i>	34-67	-

	mormon tea	EPVI	<i>Ephedra viridis</i>	34–67	–
	globemallow	SPHAE	<i>Sphaeralcea</i>	3–10	–
17				0–10	
	white sagebrush	ARLU	<i>Artemisia ludoviciana</i>	17–34	–
	banana yucca	YUBA	<i>Yucca baccata</i>	0–10	–
18				3–10	
	purple coneflower	ECHIN	<i>Echinacea</i>	3–10	–
	plains pricklypear	OPPO	<i>Opuntia polyacantha</i>	3–10	–
19				10–24	
	Fremont's mahonia	MAFR3	<i>Mahonia fremontii</i>	10–24	–
	skunkbush sumac	RHTR	<i>Rhus trilobata</i>	10–24	–
20				0–17	
	Bigelow sage	ARBI3	<i>Artemisia bigelovii</i>	0–17	–
	black sagebrush	ARNO4	<i>Artemisia nova</i>	0–17	–
21				7–20	
	buckwheat	ERIOG	<i>Eriogonum</i>	7–20	–
22				7–24	
	Indian mallow	ABUTI	<i>Abutilon</i>	7–24	–
	Wright's beebrush	ALWR	<i>Aloysia wrightii</i>	7–24	–
	Utah serviceberry	AMUT	<i>Amelanchier utahensis</i>	7–24	–
	Wyoming big sagebrush	ARTRW8	<i>Artemisia tridentata ssp. wyomingensis</i>	7–24	–
	brickellbush	BRICK	<i>Brickellia</i>	7–24	–
	desert sweet	CHMI2	<i>Chamaebatiaria millefolium</i>	7–24	–
	button brittlebush	ENFR	<i>Encelia frutescens</i>	7–24	–
	spiny hopsage	GRSP	<i>Grayia spinosa</i>	7–24	–
	false broomweed	HAPLO	<i>Haploesthes</i>	7–24	–
	winterfat	KRLA2	<i>Krascheninnikovia lanata</i>	7–24	–
	water jacket	LYAN	<i>Lycium andersonii</i>	7–24	–
	pricklypear	OPUNT	<i>Opuntia</i>	7–24	–
	mariola	PAIN2	<i>Parthenium incanum</i>	7–24	–
	Fremont's dalea	PSFRF	<i>Psoralea fremontii var. fremontii</i>	7–24	–
	Mexican cliffrose	PUME	<i>Purshia mexicana</i>	7–24	–
	snowberry	SYMPH	<i>Symphoricarpos</i>	7–24	–
	threefold	TRIXI	<i>Trixis</i>	7–24	–
<b>Tree</b>					
23				0–3	
	singleleaf ash	FRAN2	<i>Fraxinus anomala</i>	0–3	–
	Utah juniper	JUOS	<i>Juniperus osteosperma</i>	0–3	–

## Animal community

Very steep slopes and rock outcrops are very limiting to livestock use.



This site is typically a travel corridor for game animals such as deer, and is also used to some extent by jackrabbits. This site rarely receives significant negative impact from other uses and management potential for wildlife is minimal.

Potential species present include the great horned owl, golden eagle, rock wren, collared lizard, Mexican free-tailed bat, coyote, white-throated antelope squirrel, red-tailed hawk, common raven, gopher snake, leopard lizard, deer mouse, black-tailed jackrabbit, peregrine falcon, horned lark, Western rattlesnake, Western pipistrelle, canyon mouse, rock squirrel migratory birds.

## Recreational uses

Hiking, hunting, wildlife observation and photography are the main recreational activities.

## Other information

T&E Species: peregrine falcon (potential habitat)

## Type locality

Location 1: Mohave County, AZ	
Township/Range/Section	T38N R9W S4
General legal description	Grandstand 7.5 minute Quad; along the Hurricane Cliffs about 1/2 mile south of the Navajo Trail; Section 4, T38N, R9W, Mohave County, AZ.

## 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:**
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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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