

Ecological site R040XB219AZ Schist Hills 7"-10" p.z.

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General information

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

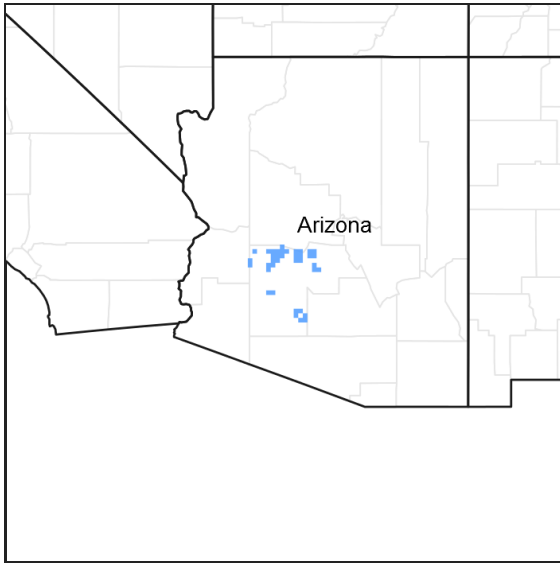


Figure 1. Mapped extent

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

MLRA notes

Major Land Resource Area (MLRA): 040X–Sonoran Basin and Range

AZ 40.2 – Middle Sonoran Desert

Elevations range from 1200 to 2000 feet and precipitation averages 7 to 10 inches per year. Vegetation includes saguaro, palo verde, creosotebush, triangle bursage, brittlebush, prickly pear, cholla, desert saltbush, wolfberry bush muhly, threeawns, and big galleta. The soil temperature regime is hyperthermic and the soil moisture regime is typical aridic. This unit occurs within the Basin and Range Physiographic Province and is characterized by numerous mountain ranges that rise abruptly from broad, plain-like valleys and basins. Igneous and metamorphic rock classes dominate the mountain ranges and sediments filling the basins represent combinations of fluvial, lacustrine, colluvial and alluvial deposits.

Table 1. Dominant plant species

Tree	(1) <i>Parkinsonia florida</i>
Shrub	(1) <i>Ambrosia deltoidea</i> (2) <i>Eriogonum fasciculatum</i>
Herbaceous	(1) <i>Pleuraphis rigida</i> (2) <i>Tridens muticus var. elongatus</i>

Physiographic features

This site occurs as steep hills, schist hillslopes and mountain slopes. Rock outcrop consists of vertically oriented, fractured schist and can make up 15-20% of the area. Outcrops are usually the ridge and mountain tops.

Table 2. Representative physiographic features

Landforms	(1) Mountain slope
Flooding duration	Very brief (4 to 48 hours)
Flooding frequency	None
Ponding frequency	None
Elevation	457–1,067 m
Slope	15–70%
Aspect	Aspect is not a significant factor

Climatic features

Precipitation in the sub-resource area ranges from 7 to 10 inches. Elevations range from 900 to 2050 feet. Winter-summer rainfall ratios range from 40% to 60% in the southern part along the international boundary, to 60% to 40% in the central and northern parts of the sub-resource area. As one moves from east to west in this resource area rains become more unpredictable and variable with Coefficients of Variation of annual rainfall equal to 38% at Florence and 46% at Aguila. Summer rains fall July- September, originate in the Gulf of Mexico, and are convective, usually brief, intense thunderstorms. Summer precipitation is extremely erratic and undependable in this area. Cool season moisture tends to be frontal, originates in the Pacific and Gulf of California, and falls in widespread storms with long duration and low intensity. This is the dependable moisture supply for vegetation in the area. Snow is very rare and usually melts on contact. May-June is the driest time of the year. Humidity is very low.

Winter temperatures are very mild with very few days recording freezing for short periods of time. Summertime temperatures are hot to very hot with many days in June-July exceeding 105 degrees F. Frost-free days range from 280 at stations in major river valleys with cold air drainage to 320 to 350 days at upland stations.

Both the spring and the summer growing seasons are equally important for perennial grass, forb and shrub growth. Cool and warm season annual forbs and grasses can be common in their respective seasons with above average rainfall. Perennial forage species can remain green throughout the year with available moisture.

Table 3. Representative climatic features

Frost-free period (average)	350 days
Freeze-free period (average)	0 days
Precipitation total (average)	254 mm

Influencing water features

Soil features

These soils are very shallow to shallow. They are generally very gravelly loams and weakly calcareous with a cover of small rock fragments. Plant-soil relationships is generally fair.

Soils mapped on this site include: SSA-645 Aguila-Carefree area MU's Dixaleta-32 & Schenco-108 & 109; SSA-653 Laposa-58 and Schenco-58.

Table 4. Representative soil features

Surface texture	(1) Gravelly loam (2) Channery loam
Family particle size	(1) Loamy
Drainage class	Well drained to somewhat excessively drained
Permeability class	Moderately slow to moderate
Soil depth	13–51 cm
Surface fragment cover <=3"	35–80%
Available water capacity (0-101.6cm)	0–6.35 cm
Electrical conductivity (0-101.6cm)	0–4 mmhos/cm
Sodium adsorption ratio (0-101.6cm)	1–5
Soil reaction (1:1 water) (0-101.6cm)	7.4–8.4

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 grazing, fire, 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 shown for the group. Divide the resulting total by the total normal year production shown in the plant community description. If 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



The State and Transition Model and Accompanying Narrative Descriptions are Still To Be Developed for this Ecological Site. For More Information Contact The Arizona NRCS State Rangeland Management Specialist.

**State 1
Historic Climax Plant Community**

**Community 1.1
Historic Climax Plant Community**

The native plant community on this site is a mixture of perennial grasses, desert shrubs and cacti. Annual grasses and forbs make up a fair portion of the plant community. As the desirable perennial grasses decline on this site, undesirable species such as chollas, paperflower and bursage will increase.

Table 5. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Shrub/Vine	252	290	328
Grass/Grasslike	127	164	202
Forb	50	63	76
Tree	26	38	50
Total	455	555	656

Figure 5. Plant community growth curve (percent production by month). AZ4021, 40.2 7-10" p.z. upland sites. Plants remain green all year, most growth occurs in late winter to early spring..

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

Additional community tables

Table 6. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Kg/Hectare)	Foliar Cover (%)
Grass/Grasslike					
0	Dominant Grasses			127–202	
	big galleta	PLRI3	<i>Pleuraphis rigida</i>	50–76	–
	slim tridens	TRMU	<i>Tridens muticus</i>	26–50	–
	bush muhly	MUPO2	<i>Muhlenbergia porteri</i>	6–26	–
1	Misc Perennial Grasses			6–26	
	threeawn	ARIST	<i>Aristida</i>	1–6	–
	tobosagrass	PLMU3	<i>Pleuraphis mutica</i>	1–6	–
	large-spike bristlegrass	SEMA5	<i>Setaria macrostachya</i>	1–6	–
	nineawn pappusgrass	ENDE	<i>Enneapogon desvauxii</i>	0–6	–
	tanglehead	HECO10	<i>Heteropogon contortus</i>	0–4	–
	sand dropseed	SPCR	<i>Sporobolus cryptandrus</i>	0–4	–
	Arizona cottontop	DICA8	<i>Digitaria californica</i>	0–4	–
	desert needlegrass	ACSP12	<i>Achnatherum speciosum</i>	0–4	–
	red grama	BOTR2	<i>Bouteloua trifida</i>	0–2	–
2	Annual Grasses			26–50	
	Hall's panicgrass	PAHA	<i>Panicum hallii</i>	1–6	–
	Bigelow's bluegrass	POBI	<i>Poa bigelovii</i>	1–6	–
	Arizona signalgrass	URAR	<i>Urochloa arizonica</i>	1–6	–
	Pacific fescue	VUMIP	<i>Vulpia microstachys</i> var. <i>pauciflora</i>	1–4	–
	sixweeks threeawn	ARAD	<i>Aristida adscensionis</i>	1–4	–
	needle grama	BOAR	<i>Bouteloua aristidoides</i>	1–4	–
	sixweeks grama	BOBA2	<i>Bouteloua barbata</i>	1–4	–
	Rothrock's grama	BORO2	<i>Bouteloua rothrockii</i>	1–4	–
	Arizona brome	BRAR4	<i>Bromus arizonicus</i>	1–4	–
	low woollygrass	DAPU7	<i>Dasyochloa pulchella</i>	1–4	–
	littleseed muhly	MUMI	<i>Muhlenbergia microsperma</i>	1–4	–
Forb					
4	Perennial Forbs			26–50	
	desert globemallow	SPAM2	<i>Sphaeralcea ambigua</i>	2–6	–
	New Mexico silverbush	ARNE2	<i>Argythamnia neomexicana</i>	2–6	–
	wishbone-bush	MILAV	<i>Mirabilis laevis</i> var. <i>villosa</i>	2–6	–
	Louisiana vetch	VILUL2	<i>Vicia ludoviciana</i> ssp. <i>ludoviciana</i>	2–6	–
	Mojave woodyaster	XYTOT	<i>Xylorhiza tortifolia</i> var. <i>tortifolia</i>	1–4	–
	desert Indianwheat	PLOV	<i>Plantago ovata</i>	1–4	–
	trailing windmills	ALIN	<i>Allionia incarnata</i>	2–4	–
	common fiddleneck	AMME12	<i>Amsinckia menziesii</i> var. <i>intermedia</i>	1–4	–

	COMMON NAME	SYMBOL	SCIENTIFIC NAME	FRUIT	SEED
	bristly fiddleneck	AMTE3	<i>Amsinckia tessellata</i>	1-4	-
	milkvetch	ASTRA	<i>Astragalus</i>	2-4	-
	desert marigold	BAMU	<i>Baileya multiradiata</i>	1-4	-
	cryptantha	CRYPT	<i>Cryptantha</i>	1-4	-
	bluedicks	DICAC5	<i>Dichelostemma capitatum ssp. capitatum</i>	1-4	-
	desert trumpet	ERIN4	<i>Eriogonum inflatum</i>	1-4	-
	brownplume wirelettuce	STPA4	<i>Stephanomeria pauciflora</i>	1-4	-
5	Annual Forbs			0-26	
	aster	ASTER	<i>Aster</i>	0-1	-
	scarlet spiderling	BOCO	<i>Boerhavia coccinea</i>	0-1	-
	spiderling	BOERH2	<i>Boerhavia</i>	0-1	-
	hoary bowlesia	BOIN3	<i>Bowlesia incana</i>	0-1	-
	California suncup	CACA32	<i>Camissonia californica</i>	0-1	-
	exserted Indian paintbrush	CAEXE	<i>Castilleja exserta ssp. exserta</i>	0-1	-
	mariposa lily	CALOC	<i>Calochortus</i>	0-1	-
	brittle spineflower	CHBR	<i>Chorizanthe brevicornu</i>	0-1	-
	devil's spineflower	CHRI	<i>Chorizanthe rigida</i>	0-1	-
	New Mexico thistle	CINE	<i>Cirsium neomexicanum</i>	0-1	-
	hairy prairie clover	DAMO	<i>Dalea mollis</i>	0-1	-
	American wild carrot	DAPU3	<i>Daucus pusillus</i>	0-1	-
	larkspur	DELPH	<i>Delphinium</i>	0-1	-
	flatcrown buckwheat	ERDE6	<i>Eriogonum deflexum</i>	0-1	-
	woollystar	ERIAS	<i>Eriastrum</i>	0-1	-
	fleabane	ERIGE2	<i>Erigeron</i>	0-1	-
	California poppy	ESCAM	<i>Eschscholzia californica ssp. mexicana</i>	0-1	-
	spurge	EUPHO	<i>Euphorbia</i>	0-1	-
	gilia	GILIA	<i>Gilia</i>	0-1	-
	Gordon's bladderpod	LEGO	<i>Lesquerella gordonii</i>	0-1	-
	shaggyfruit pepperweed	LELA	<i>Lepidium lasiocarpum</i>	0-1	-
	pepperweed	LEPID	<i>Lepidium</i>	0-1	-
	foothill deervetch	LOHU2	<i>Lotus humistratus</i>	0-1	-
	strigose bird's-foot trefoil	LOSTT	<i>Lotus strigosus var. tomentellus</i>	0-1	-
	Coulter's lupine	LUSP2	<i>Lupinus sparsiflorus</i>	0-1	-
	desertdandelion	MALAC3	<i>Malacothrix</i>	0-1	-
	Parry's false prairie-clover	MAPA7	<i>Marina parryi</i>	0-1	-
	blazingstar	MENTZ	<i>Mentzelia</i>	0-1	-
	glandular threadplant	NEGL	<i>Nemacladus glanduliferus</i>	0-1	-
	evening primrose	OENOT	<i>Oenothera</i>	0-1	-
	combseed	PECTO	<i>Pectocarya</i>	0-1	-
	Emory's rockdaisy	PEEM	<i>Perityle emoryi</i>	0-1	-
	beardtonque	PENST	<i>Penstemon</i>	0-1	-

	woolly plantain	PLPA2	<i>Plantago patagonica</i>	0–1	–
	New Mexico plumeseed	RANE	<i>Rafinesquia neomexicana</i>	0–1	–
	chia	SACO6	<i>Salvia columbariae</i>	0–1	–
	Coues' cassia	SECO10	<i>Senna covesii</i>	0–1	–
	Lemmon's ragwort	SELE8	<i>Senecio lemmonii</i>	0–1	–
	sleepy silene	SIAN2	<i>Silene antirrhina</i>	0–1	–
	catchfly	SILEN	<i>Silene</i>	0–1	–
	blue-eyed grass	SISYR	<i>Sisyrinchium</i>	0–1	–
	woolly tidestromia	TILA2	<i>Tidestromia lanuginosa</i>	0–1	–
Shrub/Vine					
6	Dominant Shrubs			95–151	
	triangle bur ragweed	AMDE4	<i>Ambrosia deltoidea</i>	26–50	–
	brittlebush	ENFA	<i>Encelia farinosa</i>	26–45	–
	creosote bush	LATRT	<i>Larrea tridentata</i> var. <i>tridentata</i>	22–39	–
	desert ironwood	OLTE	<i>Oleña tesota</i>	17–34	–
	littleleaf ratany	KRER	<i>Krameria erecta</i>	17–34	–
	Eastern Mojave buckwheat	ERFA2	<i>Eriogonum fasciculatum</i>	6–11	–
	ocotillo	FOSP2	<i>Fouquieria splendens</i>	1–6	–
7	Mid Shrubs			50–78	
	burrobush	AMDU2	<i>Ambrosia dumosa</i>	6–11	–
	Nevada jointfir	EPNE	<i>Ephedra nevadensis</i>	6–11	–
	longleaf jointfir	EPTR	<i>Ephedra trifurca</i>	6–11	–
	Mexican bladdersage	SAME	<i>Salazaria mexicana</i>	6–11	–
	jojoba	SICH	<i>Simmondsia chinensis</i>	6–11	–
	Coulter's brickellbush	BRCO	<i>Brickellia coulteri</i>	3–9	–
	narrowleaf silverbush	ARLA12	<i>Argythamnia lanceolata</i>	3–6	–
	California fagonbush	FALA	<i>Fagonia laevis</i>	0–6	–
	southern goldenbush	ISPL	<i>Isocoma pluriflora</i>	0–6	–
	slender janusia	JAGR	<i>Janusia gracilis</i>	0–6	–
	desert-thorn	LYCIU	<i>Lycium</i>	3–6	–
	Goodding's tansyaster	MAPIG2	<i>Machaeranthera pinnatifida</i> ssp. <i>gooddingii</i> var. <i>gooddingii</i>	3–6	–
	rough menodora	MESC	<i>Menodora scabra</i>	0–6	–
	slender poreleaf	POGR5	<i>Porophyllum gracile</i>	0–6	–
	toothleaf goldeneye	VIDE3	<i>Viguiera dentata</i>	3–6	–
8	Misc Shrubs			101–163	
	catclaw acacia	ACGR	<i>Acacia greggii</i>	11–28	–
	spearleaf brickellbush	BRAT	<i>Brickellia atractyloides</i>	11–28	–
	white ratany	KRGR	<i>Krameria grayi</i>	11–28	–
	whitestem paperflower	PSCO2	<i>Psilostrophe cooperi</i>	11–28	–
	button brittlebush	ENFR	<i>Encelia frutescens</i>	11–22	–
	bastardsage	ERWR	<i>Eriogonum wrightii</i>	6–17	–
	fairchildia	CAFR	<i>Calliandra eriobotrya</i>	6–17	–

	airyduster	CAER	<i>Calliandra eriophylla</i>	6-17	-
	whitethorn acacia	ACCO2	<i>Acacia constricta</i>	6-17	-
	desert lavender	HYEM	<i>Hyptis emoryi</i>	6-17	-
	San Felipe dogweed	ADPO	<i>Adenophyllum porophylloides</i>	6-17	-
	American threefold	TRCA8	<i>Trixis californica</i>	0-17	-
	Wright's beebrush	ALWR	<i>Aloysia wrightii</i>	6-11	-
	sweetbush	BEJU	<i>Bebbia juncea</i>	6-11	-
	pelotazo	ABIN	<i>Abutilon incanum</i>	6-11	-
	woody crinklemat	TICAC	<i>Tiquilia canescens var. canescens</i>	0-11	-
	ragged rockflower	CRBI2	<i>Crossosoma bigelovii</i>	6-11	-
	starry bedstraw	GASTE2	<i>Galium stellatum ssp. eremicum</i>	0-6	-
10	Succulents			6-26	
	saguaro	CAGI10	<i>Carnegiea gigantea</i>	2-6	-
	buckhorn cholla	CYACA2	<i>Cylindropuntia acanthocarpa var. acanthocarpa</i>	0-2	-
	teddybear cholla	CYBI9	<i>Cylindropuntia bigelovii</i>	1-2	-
	Wiggins' cholla	CYEC3	<i>Cylindropuntia echinocarpa</i>	0-2	-
	Christmas cactus	CYLE8	<i>Cylindropuntia leptocaulis</i>	1-2	-
	Engelmann's hedgehog cactus	ECEN	<i>Echinocereus engelmannii</i>	1-2	-
	California barrel cactus	FECYC	<i>Ferocactus cylindraceus var. cylindraceus</i>	1-2	-
	candy barrelcactus	FEWI	<i>Ferocactus wislizeni</i>	1-2	-
	Graham's nipple cactus	MAGR9	<i>Mammillaria grahamii</i>	1-2	-
	common fishhook cactus	MATE4	<i>Mammillaria tetrancistra</i>	1-2	-
	beavertail pricklypear	OPBA2	<i>Opuntia basilaris</i>	1-2	-
	dollarjoint pricklypear	OPCH	<i>Opuntia chlorotica</i>	1-2	-
	cactus apple	OPEN3	<i>Opuntia engelmannii</i>	1-2	-
	desert agave	AGDE	<i>Agave deserti</i>	0-2	-
Tree					
9	Trees			26-50	
	blue paloverde	PAFL6	<i>Parkinsonia florida</i>	13-26	-
	yellow paloverde	PAMI5	<i>Parkinsonia microphylla</i>	13-26	-

Animal community

This site has less sloping areas of hills that are easier for animals to travel. Fencing and water improvements are needed to improve distribution and utilization. Grazing should be deferred during the spring and summer rains to provide for good growth of the grasses and browse to improve condition.

Forage diversity is good but a lack of natural water and cover for larger wildlife animals, this is provided by associated canyon bottoms. Water developments are very important to wildlife on this site.

Recreational uses

Recreation activity on this site is restricted in the hot summer months of June through August. Steep sharp ridges limit some activities. There is a good variety of desert shrubs and cacti with flowers during certain times of the year and provide good color contrast against the schist outcrops. Activities include horseback riding, wildlife observation, hunting, hiking and photography.

Other products

In some areas there is mining as a use.

Type locality

Location 1: Maricopa County, AZ	
Township/Range/Section	T3N R6E S35
General legal description	Salt River Indian Reservation. Also located in Sitgreaves-Red Hill allotment, Belmont Mountains Sec 32, T4N, R6W and Ives Peak - Buckskin Mountains Sec 3, T9N, R13W.

Contributors

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Rangeland health reference sheet

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

Author(s)/participant(s)	Dave Womack, Shai Schendel, Scott Stratton, Dan Robinett, Emilio Carrillo
Contact for lead author	NRCS Tucson Area Office
Date	12/14/2005
Approved by	S. Cassady
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

Indicators

1. **Number and extent of rills:** 5-8 feet apart
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2. **Presence of water flow patterns:** very discontinuous, hard to observe due to high gravel and rock cover.
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3. **Number and height of erosional pedestals or terracettes:** Erosional pedestals are very infrequent. Accumulated pedestals are 0-1/2 inch high. Terracettes are only formed by rock fragments.
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4. **Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):** 1-2% (Low values due to high rock and gravel cover). 2-3% woody litter, 95-97% rock fragment cover.
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5. **Number of gullies and erosion associated with gullies:** None
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6. **Extent of wind scoured, blowouts and/or depositional areas:** None
-
7. **Amount of litter movement (describe size and distance expected to travel):** Most litter size classes stay in place due to high rock and gravel cover.
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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):** No slake test done. Expect ratings of 1-3 in perennial plant interspaces, 4-5 under shrub canopies.
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9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** channery thickness to 2 inches.
-
10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:** 8-10% canopy: 85% half shrubs, 11% shrubs, 4% trees. Lichens and moss cover 10-15% of soil surface. Cover is well dispersed throughout site.
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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):** None
-
12. **Functional/Structural Groups (list in order of descending dominance by above-ground annual-production or live foliar cover using symbols: >>, >, = to indicate much greater than, greater than, and equal to):**
- Dominant: subshrubs > annuals > shrubs > trees
- Sub-dominant:
- Other:
- Additional:
-
13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):** 30% mortality of half shrubs ad shrubs. 100% mortality of perennial grasses and forbs.
-
14. **Average percent litter cover (%) and depth (in):**
-
15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):** 300 lbs/ac unfavorable precipitation, 500 lbs/ac normal precipitation, 800 lbs/ac favorable precipitation.
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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: Sahara mustard, Lonon rocket, buffelgrass, red brome, filaree

17. **Perennial plant reproductive capability:** No impaired for shrubs; drought impaired for perennial grasses and forbs.
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