USDA Natural Resources Conservation Service

Ecological site R029XY330UT
Upland Stony Loam (Shrub Liveoak)

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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.

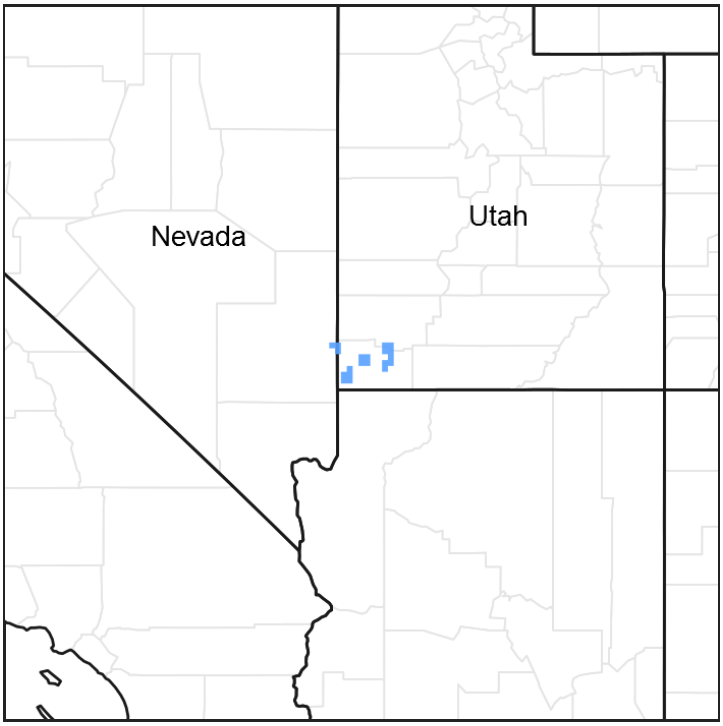

Figure 1. Mapped extent

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.

Associated sites

R029XY220UT	**Semidesert Shallow Hardpan (Blackbrush)** Semidesert Shallow Hardpan (Blackbrush)
R029XY310UT	**Upland Loam (Utah Serviceberry)** Upland Loam (Utah serviceberry)

R029XY320UT	**Upland Shallow Loam (Singleleaf Pinyon-Utah Juniper)** Upland Shallow Hardpan (Singleleaf pinyon-Utah juniper)

Table 1. Dominant plant species

Tree	Not specified
Shrub	(1) *Quercus turbinella*
Herbaceous	(1) *Achnatherum hymenoides*

Physiographic features

Table 2. Representative physiographic features

Landforms	(1) Bayou
Elevation	1,219–2,134 m
Slope	3–40%

Climatic features

Table 3. Representative climatic features

Frost-free period (average)	0 days
Freeze-free period (average)	150 days
Precipitation total (average)	356 mm

Influencing water features

Soil features

Characteristic soils in this site are moderately deep to deep and well drained. They formed in alluvium and mixed colluvium material derived mainly from sandstone, shale, and limestone. The soils are skeletal and as a whole have over 50 percent coarse fragments.

Ecological dynamics

The dominant aspect of the plant community is shrub live oak under a sparse overstory of singleleaf pinyon and utah juniper. The composition by air-dry weight of the understory is approximately 30 percent grasses, 5 percent forbs, and 65 percent shrubs.

State and transition model

Ecosystem states

1. Reference State

State 1 submodel, plant communities

1.1. Reference State

State 1
Reference State

Community 1.1
Reference State

There are historical evidences of numerous burns on this site. The shrubs tend to dominate a burned area as the trees decrease.

Table 4. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Shrub/Vine	510	874	1166
Grass/Grasslike	235	404	538
Forb	39	67	90
Total	**784**	**1345**	**1794**

Table 5. Ground cover

Tree foliar cover	11-13%
Shrub/vine/liana foliar cover	29-31%
Grass/grasslike foliar cover	6-8%
Forb foliar cover	0%
Non-vascular plants	0%
Biological crusts	0%

Litter	0%
Surface fragments >0.25" and <=3"	0%
Surface fragments >3"	0%
Bedrock	0%
Water	0%
Bare ground	0%

Table 6. Canopy structure (% cover)

Height Above Ground (M)	Tree	Shrub/Vine	Grass/ Grasslike	Forb
<0.15	–	–	–	–
>0.15 <= 0.3	–	–	6-8%	–
>0.3 <= 0.6	–	–	–	–
>0.6 <= 1.4	–	29-31%	–	–
>1.4 <= 4	–	–	–	–
>4 <= 12	11-13%	–	–	–
>12 <= 24	–	–	–	–
>24 <= 37	–	–	–	–
>37	–	–	–	–

Additional community tables

Table 7. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Kg/Hectare)	Foliar Cover (%)
Shrub/Vine					
0	**Dominant shrub**			398–883	
	Sonoran scrub oak	QUTU2	*Quercus turbinella*	211–280	–
	Utah serviceberry	AMUT	*Amelanchier utahensis*	71–140	–
	pointleaf manzanita	ARPU5	*Arctostaphylos pungens*	71–140	–
	mountain big sagebrush	ARTRV	*Artemisia tridentata ssp. vaseyana*	43–71	–
	desert ceanothus	CEGR	*Ceanothus greggii*	43–71	–
	ashy silktassel	GAFL2	*Garrya flavescens*	43–71	–
	antelope bitterbrush	PUTR2	*Purshia tridentata*	43–71	–

	alderleaf mountain mahogany	CEMO2	*Cercocarpus montanus*	28–43	–
3	**Sub-Dominant**			71–560	
	Shrub (>.5m)	2SHRUB	*Shrub (>.5m)*	71–140	–
	blackbrush	CORA	*Coleogyne ramosissima*	0–43	–
	Nevada jointfir	EPNE	*Ephedra nevadensis*	0–43	–
	broom snakeweed	GUSA2	*Gutierrezia sarothrae*	0–43	–
	pricklypear	OPUNT	*Opuntia*	0–43	–
	ponderosa pine	PIPO	*Pinus ponderosa*	0–43	–
	desert bitterbrush	PUGL2	*Purshia glandulosa*	0–43	–
	Gambel oak	QUGA	*Quercus gambelii*	0–43	–
	currant	RIBES	*Ribes*	0–43	–
	mountain snowberry	SYOR2	*Symphoricarpos oreophilus*	0–43	–
	yucca	YUCCA	*Yucca*	0–43	–
Grass/Grasslike					
0	**Dominant Grasses**			239–435	
	Indian ricegrass	ACHY	*Achnatherum hymenoides*	71–140	–
	blue grama	BOGR2	*Bouteloua gracilis*	28–43	–
	needle and thread	HECO26	*Hesperostipa comata*	28–43	–
1	**Sub-Dominant Grasses**			84–308	
	Grass, annual	2GA	*Grass, annual*	43–71	–
	Grass, perennial	2GP	*Grass, perennial*	43–71	–
	black grama	BOER4	*Bouteloua eriopoda*	0–28	–
	sedge	CAREX	*Carex*	0–28	–
	squirreltail	ELEL5	*Elymus elymoides*	0–28	–
	prairie Junegrass	KOMA	*Koeleria macrantha*	0–28	–
	western wheatgrass	PASM	*Pascopyrum smithii*	0–28	–
	sand dropseed	SPCR	*Sporobolus cryptandrus*	0–28	–
Forb					
0	**Dominant Forb**			15–28	
	American vetch	VIAM	*Vicia americana*	15–28	–
2	**Sub-Dominant Forb**			56–183	

	Forb, annual	2FA	*Forb, annual*	28–43	–
	Forb, perennial	2FP	*Forb, perennial*	28–43	–
	aster	ASTER	*Aster*	0–15	–
	Indian paintbrush	CASTI2	*Castilleja*	0–15	–
	trailing fleabane	ERFL	*Erigeron flagellaris*	0–15	–
	buckwheat	ERIOG	*Eriogonum*	0–15	–
	lupine	LUPIN	*Lupinus*	0–15	–
	locoweed	OXYTR	*Oxytropis*	0–15	–
	scarlet globemallow	SPCO	*Sphaeralcea coccinea*	0–15	–

Animal community

This site is important winter range for mule deer and elk in the northeast part of Washington County near New Harmony.

Wood products

None

Contributors

Tom Simper

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.

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Approval date	

Composition (Indicators 10 and 12) based on	Annual Production

Indicators

1. **Number and extent of rills:** No rills present. Very minor rill development may occur in sparsely vegetated areas. If rills are present, they should be widely spaced and not connected. Rill development may increase following large storm events, but should begin to heal during the following growing season. Frost heaving will accelerate recovery. Rill development may increase when run inflow enters site from adjacent sites that produce large amounts of runoff (i.e. steeper sites, slickrock, rock outcrop). Site is essentially level and rills do not form.

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2. **Presence of water flow patterns:** Water flow patterns will be very short (1-3'), narrow (<1'), and meandering; interrupted by plants and exposed rocks. Slight to no evidence of erosion or deposition associated with flow patterns. Where slopes exceed 5%, water flow patterns may be of medium length (5 –10 feet).

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3. **Number and height of erosional pedestals or terracettes:** Plants may have small pedestals (1-3") where they are adjacent to water flow patterns, but without exposed roots. Terracettes should be few and stable. Terracettes should be small (1-3") and show little sign of active erosion. Some plants may appear to have a pedestal but rather than be formed by erosion, they are the result of litter and soil accumulating at plant bases, forming the appearance of a pedestal.

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4. **Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):** 20-35% bare ground (soil with no protection from raindrop impact). Very few if any bare spaces of greater than 1 square foot. In general, bare ground increases as production decreases. As species composition of shrubs relative to grasses increases, bare ground is likely to increase. Poorly developed biological soil crust that is susceptible to erosion from raindrop impact should be recorded as bare ground.

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5. **Number of gullies and erosion associated with gullies:** No gullies present.

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6. **Extent of wind scoured, blowouts and/or depositional areas:** Very minor evidence of active wind-generated soil movement. Wind scoured (blowouts) and depositional areas are rarely present. If present they have muted features and are mostly stabilized with vegetation and/or biological crust. Gravel or desert pavement protects the site from wind scour.

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7. **Amount of litter movement (describe size and distance expected to travel):** Most litter resides in place with some redistribution caused by water and wind movement. Very minor litter removal may occur in water flow paths with deposition occurring at points of obstruction. Where litter movement does occur, litter accumulates at plant bases. Some leaves, stems, and small twigs may accumulate in soil depressions adjacent to plants. Woody stems are not likely to move.

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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):** This site should have an erosion rating of 4 to 5 under plant canopies and a rating of 3 to 4 in the interspaces with an average rating of 4 using the soil stability kit test.

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9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** A--0 to 5 cm; brown (10YR 5/3) very gravelly sandy loam, very dark grayish brown (10YR 3/2) moist; moderate thick platy structure parting to moderate very fine subangular blocky; slightly hard, friable, slightly sticky and slightly plastic; few fine, few medium, and common very fine vesicular pores; 55 percent gravel; neutral (pH 6.8); abrupt smooth boundary. (3 to 8 cm thick)

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10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:** Shrubs and well-developed biological soil crusts provide most of the interception of rainfall that prevents erosion. Biological soil crusts are resistant to raindrop impact and splash erosion. Biological soil crusts also provide surface roughness that slows runoff, allowing time for infiltration. Bunchgrasses, if present, may contribute to slowing runoff, but canopy cover from bunchgrasses is too low to provide much rainfall interception. Interspaces between shrubs and biological soil crusts may serve as water flow paths during episodic runoff events, with natural erosion expected in severe storms.

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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):** A compaction layer is not expected.

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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: Dominant: Sprouting shrubs (Dixie Live oak, Utah serviceberry, pointleaf Manzanita, antelope bitterbrush), perennial cool-season bunchgrasses (Indian ricegrass, Sandberg bluegrass)

    Sub-dominant: Sub-dominant: Non-sprouting shrubs (mountain big sagebrush) = perennial warm-season grasses

    Other: Other: Other shrubs > other perennial grasses > perennial forbs

    Additional:

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13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):** During years with average to above average precipitation, there should be very little recent mortality or decadence apparent in either the shrubs or grasses. Some mortality of bunchgrass and other shrubs may occur during very severe (long-term) droughts. There may be partial mortality of individual bunchgrasses and shrubs during less severe drought and toward the end of the fire cycle. Long-lived species dominate the site. Open spaces from disturbance are quickly filled by new plants through seedlings and asexual reproduction (tillering).

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14. **Average percent litter cover (%) and depth (in):** Litter cover includes litter under plants. Most litter will be fine (herbaceous) litter. Litter will be concentrated under plant canopies and sparser between plant canopies, with an average cover of 15-20% and an average depth of 0.5-1 inches. Litter cover may increase following years with favorable growing conditions. Excess litter may accumulate in absence of disturbance. Vegetative production may be reduced if litter cover exceeds 40%.

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15. **Expected annual annual-production (this is TOTAL above-ground annual-production,**

not just forage annual-production): 1150-1250 lbs/acre.
Even the most stable communities exhibit a range of production values. Production will vary between communities and across the MRLA. Refer to the community descriptions in the ESD. Production will differ across the MLRA due to the naturally occurring variability in weather, soils, and aspect. The biological processes on this site are complex; therefore, representative values are presented in a land management context.

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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:** Cheatgrass, halogeton, kochia, Russian thistle, Utah juniper, singleleaf pinyon, yerba santa

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17. **Perennial plant reproductive capability:** Reproduction restricted by effective precipitation, rock cover, soil depth, and generally harsh growing conditions; all to be expected for site. Site provides harsh environment for seedling establishment.
