USDA Natural Resources
Conservation Service

Ecological site R029XY310UT
Upland Loam (Utah Serviceberry)

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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.

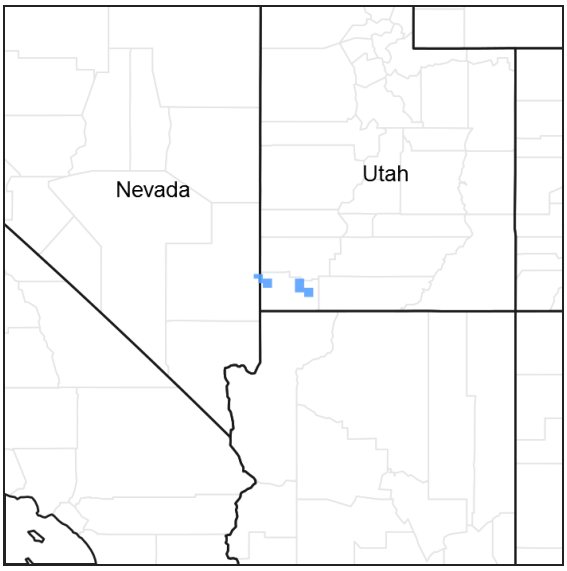

Figure 1. Mapped extent

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

R029XY320UT	**Upland Shallow Loam (Singleleaf Pinyon-Utah Juniper)** Upland Shallow Loam (Pinyon-Utah juniper)
R029XY330UT	**Upland Stony Loam (Shrub Liveoak)** Upland Stony Loam (Shrum live oak)

Similar sites

R029XY330UT	**Upland Stony Loam (Shrub Liveoak)** Upland Stony Loam (Shrub live oak)

Table 1. Dominant plant species

Tree	Not specified
Shrub	(1) *Amelanchier utahensis* (2) *Artemisia tridentata*
Herbaceous	Not specified

Physiographic features

Table 2. Representative physiographic features

Landforms	(1) Bayou
Elevation	4,500–6,200 ft
Slope	2–60%

Climatic features

Table 3. Representative climatic features

Frost-free period (average)	0 days
Freeze-free period (average)	170 days
Precipitation total (average)	14 in

Influencing water features

Soil features

Characteristic soils in this site are moderately deep and well drained. They formed in material derived mainly from weathered coarse grained acid igneous rock parent materials. These soils have very cobbly surface layers of coarse sandy loam and clay loam. The underlying layers are sandy clay loams or clay. The permeability is moderately slow.

Table 4. Representative soil features

Surface texture	(1) Sandy clay loam
Soil depth	20–40 in

Ecological dynamics

Historically this site has burned with wild fire which kept the invading singleleaf pinyon and utah juniper from taking over.

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

The dominant aspect of the plant community is utah serviceberry and other shrubs. The composition by air-dry weight is approximately 40 percent grasses, 15 percent forbs, and 45 percent shrubs.

Table 5. Annual production by plant type

Plant Type	Low (Lb/Acre)	Representative Value (Lb/Acre)	High (Lb/Acre)
Shrub/Vine	180	360	450
Grass/Grasslike	160	320	400
Forb	60	120	150
Total	**400**	**800**	**1000**

Table 6. Ground cover

Tree foliar cover	4-6%
Shrub/vine/liana foliar cover	29-31%
Grass/grasslike foliar cover	9-11%
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 7. Canopy structure (% cover)

Height Above Ground (Ft)	Tree	Shrub/Vine	Grass/ Grasslike	Forb
<0.5	–	–	–	–
>0.5 <= 1	–	–	9-11%	–
>1 <= 2	–	–	–	–
>2 <= 4.5	–	29-31%	–	–
>4.5 <= 13	4-6%	–	–	–
>13 <= 40	–	–	–	–
>40 <= 80	–	–	–	–
>80 <= 120	–	–	–	–
>120	–	–	–	–

Additional community tables

Table 8. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Lb/Acre)	Foliar Cover (%)
Shrub/Vine					

0	**Dominant Shrubs**			94–391	
	Utah serviceberry	AMUT	*Amelanchier utahensis*	17–128	–
	mountain big sagebrush	ARTRV	*Artemisia tridentata ssp. vaseyana*	9–128	–
	alderleaf mountain mahogany	CEMO2	*Cercocarpus montanus*	26–43	–
	antelope bitterbrush	PUTR2	*Purshia tridentata*	26–43	–
	Sonoran scrub oak	QUTU2	*Quercus turbinella*	0–26	–
	broom snakeweed	GUSA2	*Gutierrezia sarothrae*	17–26	–
3	**Non-Dominant Shrub**			9–128	
	Shrub (>.5m)	2SHRUB	*Shrub (>.5m)*	0–26	–
	prairie sagewort	ARFR4	*Artemisia frigida*	0–26	–
	yellow rabbitbrush	CHVI8	*Chrysothamnus viscidiflorus*	0–26	–
	bastardsage	ERWR	*Eriogonum wrightii*	0–26	–
	pricklypear	OPUNT	*Opuntia*	0–26	–
Grass/Grasslike					
0	**Dominant Grasses**			128–221	
	Indian ricegrass	ACHY	*Achnatherum hymenoides*	43–85	–
	needle and thread	HECO26	*Hesperostipa comata*	26–43	–
	western wheatgrass	PASM	*Pascopyrum smithii*	26–43	–
	prairie Junegrass	KOMA	*Koeleria macrantha*	17–26	–
	squirreltail	ELEL5	*Elymus elymoides*	17–26	–
1	**Non-Dominant Grasses**			0–102	
	Grass, annual	2GA	*Grass, annual*	0–17	–
	Grass, perennial	2GP	*Grass, perennial*	0–17	–
	blue grama	BOGR2	*Bouteloua gracilis*	0–17	–
	sedge	CAREX	*Carex*	0–17	–
	sand dropseed	SPCR	*Sporobolus cryptandrus*	0–17	–
Forb					
0	**Dominant Forb**			68–128	
	phlox	PHLOX	*Phlox*	43–85	–
	American vetch	VIAM	*Vicia americana*	26–43	–
2	**Non-Dominant Forb**			0–119	
	Forb, annual	2FA	*Forb, annual*	0–17	–
	Forb, perennial	2FP	*Forb, perennial*	0–17	–
	fleabane	ERIGE2	*Erigeron*	0–17	–
	starry bedstraw	GAST	*Galium stellatum*	0–17	–
	Cutler's spurred lupine	LUCAC	*Lupinus caudatus ssp. cutleri*	0–17	–
	ragwort	SENEC	*Senecio*	0–17	–
Tree					
4	**Tree**			43–85	
	Utah juniper	JUOS	*Juniperus osteosperma*	17–43	–
	singleleaf pinyon	PIMO	*Pinus monophylla*	26–43	–

Animal community

This site is important deer winter range. In the northeast part of Washington County it is also elk winter range.

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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Date	01/08/2013
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Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

Indicators

1. **Number and extent of rills:** Few rills present. 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 other sites that produce large amounts of runoff (i.e. steeper sites, slickrock, rock outcrop).

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2. **Presence of water flow patterns:** Water flow patterns will be short (2-5') and meandering; interrupted by plants and exposed rocks. Some evidence of erosion or deposition associated with flow patterns. Where slopes exceed 5%, water flow patterns may be longer (5–10').

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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. Well-developed biological crusts may appear pedestalled, but are actually a characteristic of the crust formation. 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):** 20-30% 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 but on steep slopes (>30%), at least half of the litter is likely to be transported downhill by wind or water short. Litter rarely moves more than 1-2' to next obstruction. Leaves, stems, and small twigs will accumulate at plant bases, against rocks, in soil depressions, or against larger woody litter. Woody litter is 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):** A1--0 to 2 inches; dark reddish gray (5YR 4/2) very cobbly coarse sandy loam, dark reddish brown (5YR 2/2) moist; moderate fine granular structure; soft, friable, slightly sticky and slightly plastic; many fine roots; 65 percent of the surface is covered with cobbles and stones; slightly acid (pH 6.4); clear smooth boundary. (2 to 12 inches thick)

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10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:** Bunchgrasses and shrubs are equally important for increasing infiltration and reducing runoff. Plant litter and canopy cover from all functional groups intercept rainfall and prevent splash erosion. Bunchgrasses contribute organic matter directly to soil through root decay, and organic matter helps stabilize soil aggregates and maintain soil porosity. Shrubs hold snow and slow wind evaporation. Bunchgrass bases intercept litter and soil in water flow paths, reducing runoff. Biological soil crusts (where present) are resistant to raindrop impact and splash erosion. Spatial distribution of vascular plants and well-developed biological soil crusts (where present) provides detention storage and surface roughness that slows runoff allowing time for infiltration. Interspaces between plants and any well-developed biological soil crusts (where present) may serve as water flow patterns 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 (Utah serviceberry, antelope bitterbrush, alderleaf mountain mahogany) > non-sprouting shrubs (mountain big sagebrush)

Sub-dominant: Sub-dominant: Perennial cool-season bunchgrasses (Indian ricegrass, needle and thread, western wheatgrass) = perennial forbs (phlox, American vetch) > trees (Utah juniper, singleleaf pinyon)

Other: Other: Other perennial grasses = other perennial forbs = other shrubs

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 5-15% and an average depth of 0.25-0.5 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):** 700-800 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.
