

Ecological site R047XC476UT

Mountain Windswept Ridge (low sagebrush)

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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.

Classification relationships

Modal Soil: Lap Family CNV-SiL, 8-25% — loamy-skeletal, carbonatic Lithic Calciborolls

Associated sites

R047XC430UT	Mountain Loam (mountain big sagebrush)
R047XC456UT	Mountain Stony Loam (antelope bitterbrush)

Similar sites

R047XC475UT	Mountain Windswept Ridge (black sagebrush)
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Table 1. Dominant plant species

Tree	Not specified
Shrub	Not specified
Herbaceous	(1) <i>Pseudoroegneria spicata</i> (2) <i>Poa fendleriana</i>

Physiographic features

Mountain and Hill Summits, Ridges, Shoulders, and Backslopes

Table 2. Representative physiographic features

Landforms	(1) Mountain (2) Ridge
Elevation	6,800–9,400 ft
Slope	4–60%

Climatic features

The climate is characterized by cool, moist summers and cold, snowy winters. Approximately 55 percent of the precipitation occurs as rain from May through September. On the average, October, November, and December are the driest months. Wind blows much of the snow off this site causing it to be bare of snow through most of the winter.

Table 3. Representative climatic features

Frost-free period (average)	90 days
Freeze-free period (average)	0 days
Precipitation total (average)	20 in

Influencing water features

Soil features

The soil is 20 to 40 inches deep over bedrock and well drained. It formed in residuum, colluvium and alluvium derived dominantly from limestone. Surface textures vary from clay loams to stony loams. The available water capacity is 0.06 to 0.10 inches per inch. The water supplying capacity is 7 to 9 inches. The soils are loamy-skeletal. Rock fragments cover 20 to 70 percent of the soil surface.

Table 4. Representative soil features

Surface texture	(1) Clay loam (2) Stony loam
Drainage class	Well drained
Soil depth	20–40 in
Surface fragment cover <=3"	20–70%
Available water capacity (0-40in)	0.06–0.1 in

Ecological dynamics

As this site deteriorates due to grazing pressure, bluebunch wheatgrass, muttongrass, prairie junegrass and needleandthread decrease while letterman needlegrass, cushion milkvetch, tufted beardtongue, pussytoes, rock goldenrod, and horsebrush increase. Under sheep grazing bluebunch wheatgrass may increase. Under cattle grazing low sagebrush may increase.

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 general view of this site is bluebunch wheatgrass. The composition by air-dry weight is approximately 60 percent perennial grasses, 10 percent forbs, and 30 percent shrubs.

Table 5. Annual production by plant type

Plant Type	Low (Lb/Acre)	Representative Value (Lb/Acre)	High (Lb/Acre)
Grass/Grasslike	150	270	390
Shrub/Vine	75	135	195
Forb	25	45	65
Total	250	450	650

Table 6. Ground cover

Tree foliar cover	0%
Shrub/vine/liana foliar cover	19-21%
Grass/grasslike foliar cover	39-41%
Forb foliar cover	4-6%
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	–	19-21%	–	4-6%
>1 <= 2	–	–	39-41%	–
>2 <= 4.5	–	–	–	–
>4.5 <= 13	–	–	–	–
>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			85–150	
	Black sagebrush	ABNO4	Artemisia nova	25–50	

	black sagebrush	ARNO4	<i>Artemisia nova</i>	25–30	–
	winterfat	KRLA2	<i>Krascheninnikovia lanata</i>	15–25	–
	serpentine wallflower orchid	TECA4	<i>Tetramicra canaliculata</i>	15–25	–
	Utah serviceberry	AMUT	<i>Amelanchier utahensis</i>	15–25	–
	prairie sagewort	ARFR4	<i>Artemisia frigida</i>	15–25	–
3	Sub-Dominant Shrubs			35–55	
	Shrub (>.5m)	2SHRUB	<i>Shrub (>.5m)</i>	15–25	–
	slender buckwheat	ERMI4	<i>Eriogonum microthecum</i>	5–15	–
	rubber rabbitbrush	ERNAO	<i>Ericameria nauseosa ssp. consimilis var. oreophila</i>	5–15	–
	antelope bitterbrush	PUTR2	<i>Purshia tridentata</i>	5–15	–
Grass/Grasslike					
0	Dominant Grasses			190–300	
	bluebunch wheatgrass	PSSP6	<i>Pseudoroegneria spicata</i>	100–150	–
	muttongrass	POFE	<i>Poa fendleriana</i>	50–75	–
	prairie Junegrass	KOMA	<i>Koeleria macrantha</i>	25–50	–
	needle and thread	HECO26	<i>Hesperostipa comata</i>	15–25	–
1	Sub-Dominant Grasses			60–110	
	Grass, annual	2GA	<i>Grass, annual</i>	15–25	–
	Grass, perennial	2GP	<i>Grass, perennial</i>	15–25	–
	Indian ricegrass	ACHY	<i>Achnatherum hymenoides</i>	5–10	–
	Letterman's needlegrass	ACLE9	<i>Achnatherum lettermanii</i>	5–10	–
	squirreltail	ELEL5	<i>Elymus elymoides</i>	5–10	–
	oniongrass	MEBU	<i>Melica bulbosa</i>	5–10	–
	western wheatgrass	PASM	<i>Pascopyrum smithii</i>	5–10	–
	Sandberg bluegrass	POSE	<i>Poa secunda</i>	5–10	–
Forb					
2	Sub-Dominant Forbs			115–295	
	Forb, annual	2FA	<i>Forb, annual</i>	25–50	–
	Forb, perennial	2FP	<i>Forb, perennial</i>	25–50	–
	littleleaf pussytoes	ANMI3	<i>Antennaria microphylla</i>	5–15	–
	cushion milkvetch	ASAR3	<i>Astragalus aretioides</i>	5–15	–
	Hooker's balsamorhiza	BAHO	<i>Balsamorhiza hookeri</i>	5–15	–
	matted buckwheat	ERCA8	<i>Eriogonum caespitosum</i>	5–15	–
	blue flax	LIPE2	<i>Linum perenne</i>	5–15	–
	hoary tansyaster	MACA2	<i>Machaeranthera canescens</i>	5–15	–
	mat penstemon	PECA4	<i>Penstemon caespitosus</i>	5–15	–
	rock goldenrod	PEPU7	<i>Petradoria pumila</i>	5–15	–
	spiny phlox	PHHO	<i>Phlox hoodii</i>	5–15	–
	spearleaf stonecrop	SELA	<i>Sedum lanceolatum</i>	5–15	–
	scarlet globemallow	SPCO	<i>Sphaeralcea coccinea</i>	5–15	–
	stemless mock goldenweed	STAC	<i>Stenotus acaulis</i>	5–15	–
	stemless four-nerve	TFACA2	<i>Tetranneuris acaulis var. acaulis</i>	5–15	–

Animal community

This site provides forage for cattle and sheep in late spring, summer and fall.

This windswept site provides food for a few species of wildlife.

Wildlife using this site include sage grouse, rabbit, coyote, mule deer, and elk.

Hydrological functions

The soil series are in hydrologic groups b and d. The hydrologic curve numbers are 61 and 80, respectively, when the vegetation is in good condition.

Recreational uses

This site offers color and aesthetic appeal during the growing season.

Wood products

None

Contributors

Garth W. Leishman, Lars L. Rassmussen

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)	V. Keith Wadman (NRCS Retired).
Contact for lead author	shane.green@ut.usda.gov
Date	12/12/2012
Approved by	
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

Indicators

1. **Number and extent of rills:** None to very few. Some minor rill development may occur on steeper slopes or on areas located below exposed bedrock or other water shedding areas where increased runoff may occur. Any rills present should be <1 inch deep, fairly short (<8 feet long) and somewhat widely spaced (6-8 feet). Minor rill development may be observed following major thunderstorm or spring runoff events but should heal during the next growing season.

2. **Presence of water flow patterns:** Some very minor evidence of water flow patterns may be found around perennial plant bases. They show little evidence of current erosion. They are expected to be somewhat short (4-8 feet), stable, sinuous and not connected. There may be very minor evidence of deposition. Evidence of water flow may increase

somewhat with slope.

3. **Number and height of erosional pedestals or terracettes:** Perennial vegetation shows little evidence of erosional pedestalling (2 to 3% of individual plants). Plant roots are covered and litter remains in place around plant crowns. Terracettes should be absent or, if present, stable. A slight increase in both pedestal and terracette development may occur with increasing slope.

4. **Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):** 15-25% bare ground. Soil surface is typically covered by approximately 35% coarse fragments. Bare ground spaces should not be greater than 2 to 3 feet in diameter.

5. **Number of gullies and erosion associated with gullies:** None to very few gullies present on site. A few gullies may be present in landscape settings where they transport runoff from areas of greater water flow such as exposed bedrock. These gullies will be limited to slopes exceeding 15% slope and adjacent to sites where this runoff accumulation occurs. Any gullies present should show little sign of accelerated erosion and should be stabilized with perennial vegetation.

6. **Extent of wind scoured, blowouts and/or depositional areas:** None to Rare. No evidence of wind generated soil movement is present. Wind caused blowouts and deposition are not present.

7. **Amount of litter movement (describe size and distance expected to travel):** Most litter resides in place with some redistribution caused by water movement. Minor litter removal may occur in flow channels with deposition occurring within 1 to 2 feet at points of obstruction. The majority of litter accumulates at the base of plants. Some grass leaves and small twigs (grass stems) may accumulate in soil depressions adjacent to plants. Woody stems are not likely to move. However, some litter movement is expected (up to 6 feet) with increases in slopes >15% and/or increased runoff resulting from heavy thunderstorms.

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 a soil stability rating of 4 or 5 under the plant canopies, and a rating of 3 to 4 in the interspaces. The average rating should be a 4. Soil surface texture is typically a very gravelly loam.

9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** (Lap) Soil surface 0-4 inches. Texture is a channery loam; color is dark grayish brown (10YR 4/2); and structure is very fine granular. Mollic epipedon ranges from 7 to 12 inches. Use the specific information for the soil you are assessing found in the published soil survey to supplement this description.

10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:** Perennial vegetation produces sufficient cover and spatial arrangement to intercept most raindrops and reduce raindrop splash erosion. Litter on soil surface and cryptogamic crusting, where present, also protects soil from splash erosion and encourages a higher rate of infiltration. Plant spatial distribution should slow runoff, allowing additional time for infiltration. Bare spaces are expected to be small and irregular in shape and are usually not connected. Vegetative structure is usually adequate to capture snow and ensure that snowmelt

occurs in a controlled manner, allowing maximum time for infiltration, and reducing runoff and erosion in all but the most extreme storm events.

11. **Presence and thickness of compaction layer (usually none; describe soil profile features which may be mistaken for compaction on this site):** None. Hard limestone occurs at approximately 13 to 17 inches, which is not a compaction layer.
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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: Perennial bunchgrasses (bluebunch wheatgrass, muttongrass) > Sprouting shrubs (low sagebrush, matted wild buckwheat).

Sub-dominant: Other perennial bunchgrasses (Indian ricegrass, prairie junegrass) >> Rhizomatous grasses (western wheatgrass) > Sprouting shrubs (green rabbitbrush >> Perennial forbs (stemless mock goldenweed).

Other: A wide variety of other perennial grasses and both perennial and annual forbs can be expected to occur in the plant community.

Additional: Natural disturbance regimes include fire, drought, and insects. Assumed fire cycle of 30 to 40+ years. Functional/structural groups may appropriately contain non-native species if their ecological function is the same as the native species in the reference state. Following a disturbance such as fire, drought, rodents or insects that remove woody vegetation, forbs and perennial grasses (herbaceous species) may dominate the community for a period of time. If a disturbance has not occurred for an extended period of time, woody species may continue to increase. These conditions could reflect different functional community phases within the reference state.

13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):** All age classes of perennial grasses should be present under average to above average growing conditions with age class expression likely subdued during periods of extended drought. Slight decadence in the principle shrubs could occur near the end of the fire cycle or during periods of extended drought, or insect infestations. In general, a mix of age classes should be expected with some dead and decadent plants present.
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14. **Average percent litter cover (%) and depth (in):** Litter cover will be heavier under plants. Most litter will be herbaceous and depths of 1/4 to 1/2 inch would be considered normal. Perennial vegetation should be well distributed on the site.
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15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):** Annual production in air-dry herbage should be approximately 400 - 500#/acre on an average year, but could range from 200 to 700#/acre during periods of prolonged drought or above average 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: Cheatgrass, Russian thistle, Utah juniper, and non-native invasive annual forbs such as alyssum.

17. **Perennial plant reproductive capability:** All perennial plants should have the ability to reproduce in all years, except in extreme drought years. Green rabbitbrush sprouts vigorously following fire. There are no restrictions on either seed or vegetative reproduction. Some seedling recruitment of major species is present during average and above average growing years.
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