

Ecological site R025XY615UT Subalpine Windswept Ridge

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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.

Associated sites

R025XY610UT	Subalpine Loam (Subalpine Sagebrush) This site is also a site with differentiae of soil and plant.
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Table 1. Dominant plant species

Tree	Not specified
Shrub	(1) <i>Artemisia frigida</i>
Herbaceous	Not specified

Physiographic features

This site is found on gentle to steep slopes that range from 5 to 45% and is usually present on ridges on mountain slopes. The elevation is high, between 7,200 to 10,000 feet. Flooding and ponding do not occur on this site.

Table 2. Representative physiographic features

Landforms	(1) Mountain slope (2) Ridge
Flooding frequency	None
Ponding frequency	None
Elevation	2,200 – 3,050 m
Slope	10 – 50 %

Climatic features

The climate is cold and snowy in the winter and cool and dry in the summer. Approximately 50 percent of the precipitation comes as snow from November through March. On the average December and January are the driest months and May and June are the wettest months.

Mean Annual Air Temperature: 38-40

Mean Annual Soil Temperature: 40-42

Table 3 Representative climatic features

Frost-free period (average)	0 days
Freeze-free period (average)	40 days
Precipitation total (average)	690 mm

Influencing water features

Soil features

The soils on this site formed in alluvium derived from quartzite and mica schist. The soils formed on ridges on mountain slopes, are well drained, and usually have some small rock fragments on the surface. The soil texture is loam and the subsurface has gravel percent by volume content of 27%. The soils are shallow with a lithic bedrock layer between 10 and 20 inches beneath the soil surface. Available water holding capacity ranged from 1.9 to 2.2 inches of water in the upper 40 inches of soil. Permeability in the upper 10 inches of soil is moderately slow. The soil temperature regime is frigid.

Soils associated with this site:

Box Elder Co. UT601 – Nielsen (7)

Table 4. Representative soil features

Surface texture	(1) Loam
Drainage class	Well drained
Permeability class	Moderately slow
Soil depth	30 – 50 cm
Surface fragment cover <=3"	10 %
Surface fragment cover >3"	Not specified
Available water capacity (0-101.6cm)	4.83 – 5.59 cm

Calcium carbonate equivalent (0-101.6cm)	Not specified
Electrical conductivity (0-101.6cm)	Not specified
Sodium adsorption ratio (0-101.6cm)	Not specified
Soil reaction (1:1 water) (0-101.6cm)	6.6 – 7.3
Subsurface fragment volume <=3" (Depth not specified)	30 %
Subsurface fragment volume >3" (Depth not specified)	10 %

Ecological dynamics

As this site deteriorates due to grazing pressure all plants decrease and the soil is left bare. When the potential natural plant community is burned, sagebrush decreases while Sandberg bluegrass, and yarrow increase.

State and transition model

Additional community tables

Table 5. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
Shrub/Vine					
0	Shrubs			0-4	
	prairie sagewort	ARFR4	<i>Artemisia frigida</i>	22-45	–
	big sagebrush	ARTRS2	<i>Artemisia tridentata ssp. spiciformis</i>	0-4	–
Grass/Grasslike					
0	Grasses			0-22	
	Idaho fescue	FEID	<i>Festuca idahoensis</i>	157-202	–
	spike trisetum	TRSP2	<i>Trisetum spicatum</i>	45-67	–
	muttongrass	POFE	<i>Poa fendleriana</i>	22-45	–
	Sandberg bluegrass	POSE	<i>Poa secunda</i>	0-22	–
Forb					
0	Primary Forbs			36-67	
	common yarrow	ACMI2	<i>Achillea millefolium</i>	22-45	–
	spiny phlox	PHHO	<i>Phlox hoodii</i>	13-22	–

2	Secondary Forbs			13-22	
	low pussytoes	ANDI2	Antennaria dimorpha	4-13	–
	Queen Anne's lace	DACA6	Daucus carota	4-13	–
	white locoweed	OXSE	Oxytropis sericea	4-13	–
	low beardtongue	PEHU	Penstemon humilis	4-13	–
	spearleaf stonecrop	SELA	Sedum lanceolatum	4-13	–

Animal community

This site provides proper grazing for cattle and sheep during summer, and fall. Wildlife using this site include sage grouse, mule deer, cottontail rabbit, coyote, red-tailed hawk, and potgut ground squirrel. This is a short list of the more common species found. Many other species are present as well and migratory birds are present at times.

Hydrological functions

This soil is in hydrologic group D. The runoff curve numbers are 80 through 89 depending on the condition of the watershed.

Recreational uses

Hiking and Hunting

Wood products

None

Other information

Threatened and endangered species include plants and animals.

Type locality

Location 1: Box Elder County, UT	
General legal description	Top of Raft River Mountains at “The Meadows”

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.

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Date	03/30/2007
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Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

Indicators

- 1. Number and extent of rills:** Some 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).

- 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').

- 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.

- 4. Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):** 30-50% 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.

- 5. Number of gullies and erosion associated with gullies:** None to very few. Gullies should show only minor signs of active erosion and should be mostly stabilized with perennial vegetation and rock fragments. Gullies may show slightly more indication of erosion as slope steepens, or as the site occurs adjacent to steep areas with concentrated flow patterns.

- 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.

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.

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.

9. Soil surface structure and SOM content (include type of structure and A-horizon color and thickness): A1--0 to 2 inches; dark grayish brown (10YR 4/2) loam, very dark brown (10YR 2/2) moist; very weak very fine platy structure parting to moderate very fine granular; soft, very friable, slightly sticky and slightly plastic; many very fine, fine, and medium roots; many very fine interstitial pores; 5 percent angular gravel and flagstones with 10 percent surface stones; neutral (pH 6.7); abrupt smooth boundary. (1 to 4 inches thick)

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.

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.

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: Perennial cool-season bunchgrasses (Idaho fescue, muttongrass, spike trisetum) > non-sprouting shrubs (fringed sagebrush)

Sub-dominant: Sub-dominant: Perennial forbs (common yarrow, spiny phlox)

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

Additional: Disturbance regime includes drought, insects, and very infrequent fire. Dominance by average annual production: perennial bunchgrasses > native perennial and annual forbs non-sprouting shrubs > sprouting shrubs. Functional/structural groups may appropriately contain non-native species if their ecological function is the same as the native species in the reference state (e.g. Smooth brome etc.) Following a recent disturbance such as drought or insects that removes the woody vegetation, forbs and perennial grasses (herbaceous species) may dominate the community. These conditions would reflect a functional community phase within the reference state.

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. Long-lived species dominate the site. Open spaces from disturbance are quickly filled by new plants through seedlings and asexual reproduction (tillering).

14. **Average percent litter cover (%) and depth (in):** Litter cover includes litter under plants. Most litter will be fine (herbaceous) litter. Almost all litter is concentrated under plant canopies. Litter between plant canopies is very sparse. Average litter cover is 5-15% and average litter depth is 0.25-0.5 inches.
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15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):** 350-400 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: Invasive species unlikely because of high elevation
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17. **Perennial plant reproductive capability:** All perennial plants should have the ability to reproduce sexually or asexually, except in drought years. Density of plants indicates that plants reproduce at level sufficient to fill available resource. Within capability of site there are no restrictions on seed or vegetative reproductive capacity.
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