

Ecological site R034BY244UT

Semidesert Stony Loam (Salina Wildrye)

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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

R034BY247UT	Semidesert Stony Loam (Utah Juniper-Pinyon) Semidesert Stony Loam (Utah juniper-Pinyon)
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Table 1. Dominant plant species

Tree	Not specified
Shrub	Not specified
Herbaceous	(1) <i>Leymus salinus ssp. salinus</i> (2) <i>Hilaria jamesii</i>

Physiographic features

This site occurs on mesas and alluvial fans. Slopes are mostly 3 to 15 percent. Elevations range from 5,200 to 6,200 feet on all aspects.

Table 2. Representative physiographic features

Landforms	(1) Mesa (2) Alluvial fan
Elevation	5,200–6,200 ft
Slope	3–15%

Climatic features

Average annual soil loss in potential is approximately 3 tons/acre. Average annual precipitation is 9 to 12 inches. Approximately 35% occurs as snow from November

through February. On the average, may through June are the driest months and August through October are the wettest months. The mean annual air temperature is 9-11 degrees celsius and the soil temperatures are in the mesic regime. The average freeze-free period is 130 to 160 days. The climate of this ecosystem is semidesert with about 45 to 50 percent of the precipitation occurring during the plant growth period, March through September. In average years, plants begin growth around March 1 and end growth around October 30.

Table 3. Representative climatic features

Frost-free period (average)	0 days
Freeze-free period (average)	160 days
Precipitation total (average)	12 in

Influencing water features

Soil features

Characteristic soils in this site are 20 to 40 inches deep over gypsiferous shale and moderately well-drained. They formed in alluvium over residuum derived mainly from sandstone and shale parent materials. The soils commonly have a cobble fine sandy loam surface. Silty clay loam and silty clay extend to depths of 20 to 40 inches over gypsiferous shale. Permeability is very slow. Water supplying capacity is 3.5 to 7.5 inches. Effective rooting depth is 20 to 40 inches. Runoff is medium and the hazard of water erosion is moderate. The water supplying capacity is 3.5 to 7.5 inches.

Table 4. Representative soil features

Surface texture	(1) Cobbly sandy loam
Family particle size	(1) Loamy
Soil depth	20–40 in

Ecological dynamics

As ecological condition deteriorates due to grazing pressure, or drought, perennial grasses decrease while unpalatable shrubs and forbs increase. When the potential natural plant community is burned most of the perennial grasses and shadscale decrease while low rabbitbrush, broom snakeweed and weeds increase. Cheatgrass is most likely to invade this site.

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 Salina wildrye. The composition by air-dry weight is approximately 70 percent perennial grasses, 10 percent forbs and 20 percent shrubs.

Table 5. Annual production by plant type

Plant Type	Low (Lb/Acre)	Representative Value (Lb/Acre)	High (Lb/Acre)
Grass/Grasslike	123	193	263
Shrub/Vine	35	55	75
Forb	18	28	38
Total	176	276	376

Table 6. Ground cover

Tree foliar cover	0%
Shrub/vine/liana foliar cover	9-11%
Grass/grasslike foliar cover	49-51%
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	–	–	–	4-6%
>1 <= 2	–	9-11%	49-51%	–
>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			21–39	
	shadscale saltbush	ATCO	<i>Atriplex confertifolia</i>	9–15	–
	yellow rabbitbrush	CHVI8	<i>Chrysothamnus viscidiflorus</i>	9–15	–
	broom snakeweed	GUSA2	<i>Gutierrezia sarothrae</i>	9–15	–
3	Sub-Dominant Shrubs			45–90	
	Shrub (>.5m)	2SHRUB	<i>Shrub (>.5m)</i>	15–30	–
	kingcup cactus	ECTR	<i>Echinocereus triglochidiatus</i>	3–6	–

	Torrey's jointfir	EPTO	<i>Ephedra torreyana</i>	3–6	–
	mormon tea	EPVI	<i>Ephedra viridis</i>	3–6	–
	slender buckwheat	ERMI4	<i>Eriogonum microthecum</i>	3–6	–
	rubber rabbitbrush	ERNA10	<i>Ericameria nauseosa</i>	3–6	–
	winterfat	KRLA2	<i>Krascheninnikovia lanata</i>	3–6	–
	plains pricklypear	OPPO	<i>Opuntia polyacantha</i>	3–6	–
	bud sagebrush	PIDE4	<i>Picrothamnus desertorum</i>	3–6	–
	spiny milkwort	POSU2	<i>Polygala subspinoso</i>	3–6	–
Grass/Grasslike					
0	Dominand Grasses			195–240	
	saline wildrye	LESAS	<i>Leymus salinus ssp. salinus</i>	150–165	–
	muttongrass	POFE	<i>Poa fendleriana</i>	9–15	–
	Indian ricegrass	ACHY	<i>Achnatherum hymenoides</i>	9–15	–
	squirreltail	ELEL5	<i>Elymus elymoides</i>	9–15	–
	needle and thread	HECO26	<i>Hesperostipa comata</i>	9–15	–
1	Sub-Dominant Grasses			18–30	
	Forb, annual	2FA	<i>Forb, annual</i>	9–15	–
	Forb, perennial	2FP	<i>Forb, perennial</i>	9–15	–
Forb					
2	Sub-Dominant Forbs			75–150	
	Forb, annual	2FA	<i>Forb, annual</i>	15–30	–
	Forb, perennial	2FP	<i>Forb, perennial</i>	15–30	–
	Nevada onion	ALNE	<i>Allium nevadense</i>	3–6	–
	littleleaf pussytoes	ANMI3	<i>Antennaria microphylla</i>	3–6	–
	woolly locoweed	ASMO7	<i>Astragalus mollissimus</i>	3–6	–
	northwestern Indian paintbrush	CAAN7	<i>Castilleja angustifolia</i>	3–6	–
	sego lily	CANU3	<i>Calochortus nuttallii</i>	3–6	–
	James' cryptantha	CRCI3	<i>Cryptantha cinerea</i>	3–6	–
	desert trumpet	ERIN4	<i>Eriogonum inflatum</i>	3–6	–
	cushion buckwheat	EROV	<i>Eriogonum ovalifolium</i>	3–6	–
	flatspine stickseed	LAOC3	<i>Lappula occidentalis</i>	3–6	–
	juniper biscuitroot	LOJU	<i>Lomatium juniperinum</i>	3–6	–

	rayless tansyaster	MAGR2	<i>Machaeranthera grindelioides</i>	3–6	–
	spiny phlox	PHHO	<i>Phlox hoodii</i>	3–6	–
	scarlet globemallow	SPCO	<i>Sphaeralcea coccinea</i>	3–6	–
	desert princesplume	STPI	<i>Stanleya pinnata</i>	3–6	–
	Pacific aster	SYCHC	<i>Symphotrichum chilense</i> <i>var. chilense</i>	3–6	–

Animal community

This site provides proper grazing for sheep and cattle during fall, winter, and spring. This site provides food and limited cover for wildlife. Wildlife using this site include jackrabbit, snake, coyote, and hawk.

Hydrological functions

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

Recreational uses

This site has moderate recreational opportunities and often has scenic vistas.

Wood products

None

Other references

Modal Soil: Lockerby CB-FSL — fine, montmorillonitic, mesic Usteritic Camborthids

Type Location: Consult the Grand County Soil Survey Report

Contributors

George Cook

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	04/10/2012
Approved by	Shane A. Green
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

Indicators

- 1. Number and extent of rills:** No rills present. Some minor rill development may occur where this site occurs below exposed bedrock or other water shedding areas where increased runoff may occur. Where rills are present, they should be fairly short (3-6 feet), <1 inch deep and somewhat widely spaced (4-8 feet). Rills may increase in length (4-8 feet) and decrease in spacing (3-6 feet) on slopes greater than 40 percent. A minor increase in rill development may be observed on all slopes following major thunderstorm or spring runoff events but should heal during the next growing season.

- 2. Presence of water flow patterns:** 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 short (3-6 feet), stable, sinuous, and not connected. There may be very minor evidence of deposition. Evidence of water flow may increase somewhat following significant spring runoff events or major thunderstorms, but should heal during the following growing season.

- 3. Number and height of erosional pedestals or terracettes:** Perennial vegetation shows very little evidence of erosional pedestalling (< 1% 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):** 20-25% bare ground. Soil surface is covered by 35 to 60 percent gravels and/or channers. Bare ground spaces should not be greater than 1 foot in diameter.
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5. **Number of gullies and erosion associated with gullies:** No gullies present on site. A very 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 areas where this runoff accumulation occurs. Any gullies present should show little sign of accelerated erosion and should be stabilized with perennial vegetation.
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6. **Extent of wind scoured, blowouts and/or depositional areas:** None. No evidence of wind generated soil movement is present. This site is covered with gravel and/or channers on the soil surface which help armor it and reduce the potential for wind erosion. Wind caused blowouts and deposition are not present.
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7. **Amount of litter movement (describe size and distance expected to travel):** Most litter resides in place with some minor redistribution downslope caused by water movement. Minor litter removal may occur in flow channels with deposition occurring within 1 foot 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. A minor increase in litter movement is expected (up to 2 feet) as slopes approach 15% and/or following heavy thunderstorms.
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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 a soil stability rating of 5 or 6 under the plant canopies, and a rating of 4 to 5 in the interspaces. The average rating should be a 5.
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9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** (Lanver) Soil surface 0-3 inches. Texture is a very channery sandy loam; color is brown (10YR 6/3); and structure is moderate thin and medium platy parting to weak very fine subangular blocky. Ochric epipedon ranges from 0 to 3 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:** Surface coarse fragments combined with perennial vegetation produce sufficient cover and spatial arrangement to intercept most raindrops and reduce raindrop splash erosion. Litter on soil surface and cryptogamic crusting, where present, also protect 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. When perennial grasses and shrubs decrease due to natural events (i.e., drought, insect damage, etc.) which reduce ground cover and increase bare ground, runoff is expected to increase and associated infiltration be reduced.
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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. This soil contains significant amounts of coarse fragments throughout the profile. Sandstone bedrock occurs at about 36 to 40 inches.
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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 (Salina wildrye, Indian ricegrass), >> Non-sprouting shrubs (shadscale, broom snakeweed), > Sprouting shrub (green rabbitbrush).

Sub-dominant: Rhizomatous grasses (James galleta) > = Sprouting shrubs (green ephedra) > Perennial forbs (scarlet globemallow).

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 would reflect natural 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. There may be partial mortality on individual bunchgrasses and shrubs during drought periods and complete mortality of individual plants during severe drought periods. 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 around perennial 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 250 - 300 #/acre on an average year but could range from 150 - 400 #/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.
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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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