

Ecological site R034BY329UT **Upland Silt Loam (Fourwing saltbush/Winterfat)**

Accessed: 05/18/2024

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

R034BY320UT	Upland Shallow Loam (Black Sagebrush)
R034BY322UT	Upland Shallow Loam (Two-Needle Pinyon / Utah Juniper)

Table 1. Dominant plant species

Tree	Not specified
Shrub	(1) <i>Atriplex canescens</i> (2) <i>Krascheninnikovia lanata</i>
Herbaceous	Not specified

Physiographic features

This site occurs on stream terraces, washes, toeslopes and alluvial fans. Slopes are mostly 2 to 8 percent. Elevations range from 6,000 feet to 7,000 feet on all aspects.

Table 2. Representative physiographic features

Landforms	(1) Stream terrace (2) Alluvial fan
Elevation	1,829–2,134 m
Slope	2–8%

Climatic features

Average annual precipitation is 12 to 14 inches. Approximately 60% occurs as rain from March through October. Much of this summer precipitation occurs as convection thunderstorms. On the average, November through February are the driest months and July through October are the wettest months. Soil temperatures are in the mesic and frigid regime. In average years, plants begin growth around March and April and end growth in October. Plants usually remain green until frost in October except in drier than average years. There is usually an active greenup period in the fall. The most rapid growth occurs during April, May and June.

Table 3. Representative climatic features

Frost-free period (average)	0 days
Freeze-free period (average)	125 days
Precipitation total (average)	356 mm

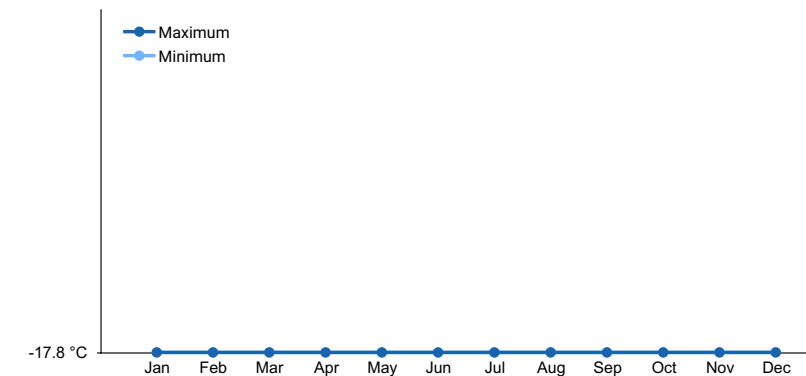


Figure 1. Monthly average minimum and maximum temperature

Influencing water features

Soil features

Characteristic soils in this site are deep to very deep and well drained. They formed in alluvium derived mainly from sedimentary parent materials. Soils have a silt loam surface texture and are calcareous. The water supplying capacity is 6 to 8 inches. Average annual soil loss in potential is approximately .5 to 1 ton/acre.

Table 4. Representative soil features

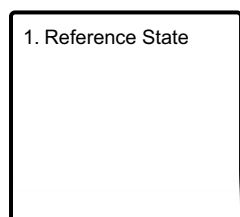
Surface texture	(1) Silt loam
Drainage class	Well drained
Soil depth	102–152 cm

Ecological dynamics

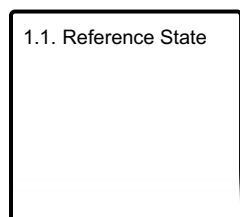
As ecological condition deteriorates due to overgrazing, perennial bunch grasses will decrease while cheatgrass and western wheatgrass increase. Under cattle grazing, fourwing saltbush and winterfat may dominate the site. Although this site can burn, fire does not appear to be an important ecological factor. Cheatgrass and annual weeds are most likely to invade this site.

State and transition model

Ecosystem states



State 1 submodel, plant communities



State 1 Reference State

Community 1.1
Reference State

The dominant aspect of the plant community is fourwing saltbush and winterfat. The composition by air-dry weight is approximately 35 percent perennial grasses, 10 percent forbs and 55 percent shrubs.

Table 5. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Shrub/Vine	308	463	586
Grass/Grasslike	196	295	373
Forb	56	84	106
Total	560	842	1065

Table 6. Ground cover

Tree foliar cover	0%
Shrub/vine/liana foliar cover	44-46%
Grass/grasslike foliar cover	24-26%
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 (M)	Tree	Shrub/Vine	Grass/ Grasslike	Forb
<0.15	—	—	—	—
>0.15 <= 0.3	—	—	—	4-6%
>0.3 <= 0.6	—	—	24-26%	—
>0.6 <= 1.4	—	44-46%	—	—
>1.4 <= 4	—	—	—	—
>4 <= 12	—	—	—	—
>12 <= 24	—	—	—	—
>24 <= 37	—	—	—	—
>37	—	—	—	—

Additional community tables

Table 8. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Kg/Hectare)	Foliar Cover (%)
Shrub/Vine					
0	Dominant Shrubs			359–493	
	fourwing saltbush	ATCA2	<i>Atriplex canescens</i>	179–224	–
	winterfat	KRLA2	<i>Krascheninnikovia lanata</i>	135–179	–
	basin big sagebrush	ARTRT	<i>Artemisia tridentata ssp. tridentata</i>	45–90	–
3	Sub-Dominant Shrubs			54–126	
	Shrub (>.5m)	2SHRUB	<i>Shrub (>.5m)</i>	27–45	–
	prairie sagewort	ARFR4	<i>Artemisia frigida</i>	9–27	–
	yellow rabbitbrush	CHVI8	<i>Chrysothamnus viscidiflorus</i>	9–27	–
	broom snakeweed	GUSA2	<i>Gutierrezia sarothrae</i>	9–27	–
Grass/Grasslike					
0	Dominant Grasses			188–359	
	western wheatgrass	PASM	<i>Pascopyrum smithii</i>	90–135	–
	Indian ricegrass	ACHY	<i>Achnatherum hymenoides</i>	45–90	–
	needle and thread	HECO26	<i>Hesperostipa comata</i>	45–90	–
1	Sub-Dominant Grasses			90–197	
	Grass, annual	2GA	<i>Grass, annual</i>	27–45	–
	Grass, perennial	2GP	<i>Grass, perennial</i>	27–45	–
	blue grama	BOGR2	<i>Bouteloua gracilis</i>	9–27	–
	squirreltail	ELEL5	<i>Elymus elymoides</i>	9–27	–
	Sandberg bluegrass	POSE	<i>Poa secunda</i>	9–27	–
	sand dropseed	SPCR	<i>Sporobolus cryptandrus</i>	9–27	–
Forb					
0	Dominant Forbs			9–45	
	scarlet globemallow	SPCO	<i>Sphaeralcea coccinea</i>	9–45	–
2	Sub-Dominant Forbs			117–215	
	Forb, annual	2FA	<i>Forb, annual</i>	27–45	–
	Forb, perennial	2FP	<i>Forb, perennial</i>	27–45	–
	basin fleabane	ERPU9	<i>Erigeron pulcherrimus</i>	9–18	–
	Shockley's buckwheat	ERSH	<i>Eriogonum shockleyi</i>	9–18	–
	mountain pepperweed	LEMO2	<i>Lepidium montanum</i>	9–18	–
	hoary tansyaster	MACA2	<i>Machaeranthera canescens</i>	9–18	–
	longleaf phlox	PHLO2	<i>Phlox longifolia</i>	9–18	–
	hedgemustard	SIOF	<i>Sisymbrium officinale</i>	9–18	–
	Pacific aster	SYCHC	<i>Symphyotrichum chilense var. chilense</i>	9–18	–

Animal community

This site provides proper grazing for cattle and sheep during spring, summer, and fall.

This site provides food and cover for wildlife.

Wildlife using this site include jackrabbit, coyote, mule deer and elk.

Hydrological functions

The soil is in hydrologic group b. The runoff curve numbers are 61 through 79 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: Mikim SiL Moist 2-8% — fine-loamy, mixed calcareous, mesic Ustic Torriorthents

Contributors

J. Lee Broadbent

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)	Shane A. Green (NRCS), Brock Benson (NRCS), Robert D. Stager (BLM), Mike Gates (BLM), Tyler Staggs (BLM), Alan Bass (BLM). Adapted to this site and revised to include updated terminology and concepts by V. Keith Wadman (NRCS Retired).
Contact for lead author	shane.green@ut.usda.gov
Date	12/15/2011
Approved by	Shane A. Green
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

Indicators

- 1. Number and extent of rills:** None to very few rills present. Some minor rill development may occur on slopes >5% or on areas located below exposed bedrock or other water shedding areas where increased runoff may occur. Where these rills are present, they should be fairly short (3-6 feet), <1 inch deep and somewhat widely spaced (4-8 feet). Minor 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:** 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 short (3-6 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 (1 to 2% 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):** 10-20% bare ground. Bare ground spaces should not be greater than 1 to 2 foot in diameter.
-
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 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 very slight. Very little 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.
-
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 textures are mostly loams and silt loams.
-
9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** (Bigpack) Soil surface 0-4 inches. Texture is a silt loam; color is very dark gray brown (10YR3/2); and structure is weak medium subangular blocky parting to weak granular. Ochric epipedon ranges to 4 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. When perennial grasses and shrubs decrease due to natural events including drought, insect damage, etc., which reduce ground cover and increase bare ground, runoff is expected to increase and associated

infiltration reduced.

11. **Presence and thickness of compaction layer (usually none; describe soil profile features which may be mistaken for compaction on this site):** None. Some soils have an increase in clay content deep in their profile that could be mistaken for a compaction pan.
-

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: Sprouting shrubs (Fourwing saltbush, winterfat) > Rhizomatous grasses (western wheatgrass) > Non-sprouting shrubs (basin big sagebrush).

Sub-dominant: Sprouting shrubs (green rabbitbrush, rubber rabbitbrush) > Perennial bunchgrasses (Indian ricegrass, Nevada bluegrass) > 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 (e.g. Crested wheatgrass, Smooth brome, intermediate wheatgrass, Siberian Wheatgrass etc.)

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 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):** 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.
-

14. **Average percent litter cover (%) and depth (in):** Litter cover will be heavier under plants. Most litter will be herbaceous and depths of 1/2 to 1 inch would be considered normal. Perennial vegetation should be well distributed on the site.
-

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 700 - 800 #/acre on an average year but could range from 450 - 1000 #/acre during periods of prolonged drought or above average precipitation.
-

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.
-