

Ecological site R028AY258UT

Semidesert Very Shallow Loam (Littleleaf Mountainmahogany)

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.

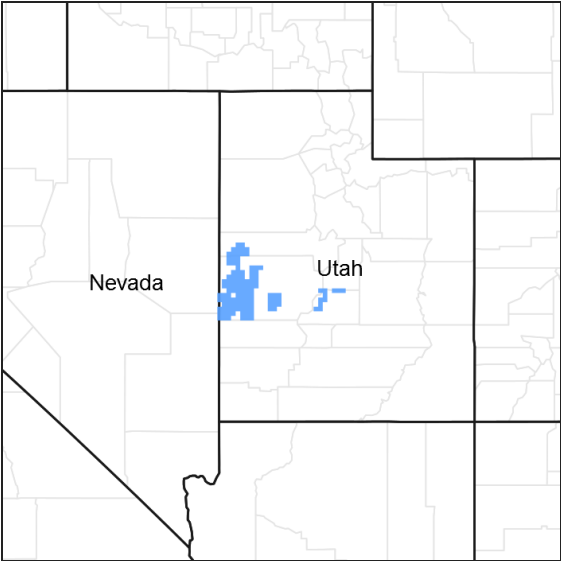


Figure 1. Mapped extent

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

| | |
|-------------|---|
| R028AY234UT | Semidesert Shallow Loam (Utah juniper-Salina wildrye) |
| R028AY252UT | Semidesert Stony Loam (Black Sagebrush) |

Table 1. Dominant plant species

| | |
|------------|-----------------------------------|
| Tree | Not specified |
| Shrub | (1) <i>Cercocarpus intricatus</i> |
| Herbaceous | Not specified |

Physiographic features

This site occurs on rolling hills and steep mountain slopes.

Table 2. Representative physiographic features

| | |
|-----------|--------------------------------|
| Landforms | (1) Hill (2) Mountain slope |
| Elevation | 1,829–2,286 m |

| | |
|-------|--------|
| Slope | 15–70% |
|-------|--------|

Climatic features

The climate is semi-arid and characterized by cold snowy winters and warm dry summers. The average annual precipitation is 8 to 12 inches. Approximately 70 percent comes as rain from March through October. On the average, June through September are the driest months and March through May are the wettest months.

Mean Annual Air Temperature: 50-55
Mean Annual Soil Temperature: 52-57

Table 3. Representative climatic features

| | |
|-------------------------------|----------|
| Frost-free period (average) | 0 days |
| Freeze-free period (average) | 120 days |
| Precipitation total (average) | 305 mm |

Influencing water features

Soil features

The characteristic soils in this site are 6 to 14 inches deep over bedrock and well drained.

They formed in colluvium derived mainly from limestone parent materials. The surface horizon is loam texture and 5 inches thick. About 40 percent of the soil surface is covered by rock fragments.

The soils of this site are very shallow and skeletal with more than 35 percent rock fragments throughout the soil profile.

The water supplying capacity is 1.25 to 1.75 inches. Natural geologic erosion in potential is approximately 1 ton/acre/year.

Table 4. Representative soil features

| | |
|--|--------------|
| Drainage class | Well drained |
| Soil depth | 15–36 cm |
| Surface fragment cover <=3" | 20% |
| Surface fragment cover >3" | 20% |
| Subsurface fragment volume <=3" (Depth not specified) | 18% |
| Subsurface fragment volume >3" (Depth not specified) | 18% |

Ecological dynamics

As ecological condition deteriorates due to overgrazing, Indian ricegrass and bluebunch wheatgrass, decrease, while snakeweed and low rabbitbrush increase.

Fire is not an important ecological factor in this ecosystem.

Cheatgrass and annual weeds are 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 this plant community is littleleaf mountain mahogany. The composition by air-dry weight is approximately 25 percent perennial grasses, 10 percent forbs, and 65 percent shrubs.

Table 5. Annual production by plant type

| Plant Type | Low (Kg/Hectare) | Representative Value (Kg/Hectare) | High (Kg/Hectare) |
|-----------------|---------------------|--------------------------------------|----------------------|
| Shrub/Vine | 110 | 273 | 437 |
| Grass/Grasslike | 43 | 105 | 168 |
| Forb | 17 | 43 | 67 |
| Total | 170 | 421 | 672 |

Table 6. Ground cover

| | |
|-----------------------------------|--------|
| Tree foliar cover | 2-5% |
| Shrub/vine/liana foliar cover | 20-40% |
| Grass/grasslike foliar cover | 5-15% |
| Forb foliar cover | 2-5% |
| 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 | — | — | — | 0-10% |
| >0.3 <= 0.6 | — | — | 10-20% | — |
| >0.6 <= 1.4 | 0-10% | 35-45% | — | — |
| >1.4 <= 4 | — | — | — | — |
| >4 <= 12 | — | — | — | — |
| >12 <= 24 | — | — | — | — |
| >24 <= 37 | — | — | — | — |
| >37 | — | — | — | — |

Figure 4. Plant community growth curve (percent production by month).
UT2581, PNC. Excellent Condition.

| Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 0 | 0 | 5 | 15 | 40 | 30 | 5 | 5 | 0 | 0 | 0 | 0 |

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 | Primary Shrubs | | | 206–314 | |
| | littleleaf mountain mahogany | CEIN7 | <i>Cercocarpus intricatus</i> | 135–202 | – |
| | black sagebrush | ARNO4 | <i>Artemisia nova</i> | 45–67 | – |
| | shadscale saltbush | ATCO | <i>Atriplex confertifolia</i> | 13–22 | – |
| | yellow rabbitbrush | CHVI8 | <i>Chrysothamnus viscidiflorus</i> | 13–22 | – |
| 3 | Secondary Shrubs | | | 13–22 | |
| Grass/Grasslike | | | | | |
| 0 | Primary Grasses | | | 72–126 | |
| | Indian ricegrass | ACHY | <i>Achnatherum hymenoides</i> | 45–67 | – |
| | bluebunch wheatgrass | PSSP6 | <i>Pseudoroegneria spicata</i> | 22–45 | – |
| | Sandberg bluegrass | POSE | <i>Poa secunda</i> | 4–13 | – |
| 1 | Secondary Grasses | | | 13–22 | |
| | pine needlegrass | ACPI2 | <i>Achnatherum pinetorum</i> | 4–13 | – |
| | squirreltail | ELEL5 | <i>Elymus elymoides</i> | 4–13 | – |
| | needle and thread | HECO26 | <i>Hesperostipa comata</i> | 4–13 | – |
| Forb | | | | | |
| 2 | Forbs | | | 22–45 | |
| | Holboell's rockcress | ARHO2 | <i>Arabis holboellii</i> | 4–13 | – |
| | cushion buckwheat | EROV | <i>Eriogonum ovalifolium</i> | 4–13 | – |
| | rock goldenrod | PEPU7 | <i>Petradoria pumila</i> | 4–13 | – |
| | spiny phlox | PHHO | <i>Phlox hoodii</i> | 4–13 | – |
| Tree | | | | | |
| 4 | Trees | | | 4–13 | |
| | Utah juniper | JUOS | <i>Juniperus osteosperma</i> | 4–13 | – |

Animal community

This site is suited for grazing by cattle and sheep during fall, winter, and spring.

Wildlife using this site include rabbit, coyote, fox, badger, pronghorn antelope, mule deer, and dove.

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

The soils are in hydrological group D with runoff curves ranging from 65 to 75 depending on hydrologic condition.

Recreational uses

Resources that have special aesthetic and landscape values are the geologic slick rock with scattered shrubs and trees. Some recreation uses of this site are hiking and hunting.

Wood products

None

Other information

Threatened and endangered species include plants and animals.

Type locality

| | |
|--------------------------------|---|
| Location 1: Millard County, UT | |
| General legal description | 2 Miles South of Cedar Pass Reservoir in Western Millard County, Utah |

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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| Contact for lead author | Shane Green, Shane.Green@ut.usda.gov |
| Date | 02/09/2010 |
| Approved by | Shane A. Green |
| 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 are common. Some are long (15-20'). They are generally very widely spaced (about 20-30' apart). Flow patterns occur in low places associated with microtopography commonly occurring on this site.
- 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, the only place litter accumulates and soil collects is 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, the only place litter accumulates and soil

collects is 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):** 25-45% bare ground (soil with no protection from raindrop impact). Herbaceous communities are most likely to have lower values. As species composition by shrubs increases, bare ground is likely to increase. Poorly developed biological soil crust that is susceptible to raindrop splash erosion should be recorded as bare ground. Very few if any bare spaces of greater than 1 square foot.
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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 is present in reference communities. Wind scoured (blowouts) and depositional areas are rarely present. Slight depositional mounding at plant bases. Slight deposition may occur in perennial bunchgrasses, under winterfat canopy, and within biological soil crusts. Wind scour or deposition areas are associated with fire activity. Very small areas (less than 4 square feet) may be present.
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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 flow patterns and rills with deposition occurring at points of obstruction. The majority of litter accumulates at the base of plants. Some leaves, stems, and small twigs may accumulate in soil depressions adjacent to plants. Woody stems are not likely to move. On steep slopes (>30%), litter will move downhill to next obstruction.
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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 5 or 6 under plant canopies and a rating of 4 to 5 in the interspaces with an average rating of 5 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):** This description is based on the modal soil (Amtoft Family, Very Shallow, soil survey area: 617, West Millard - Juab Area), the only soil correlated with this site.

Soil surface horizon is typically 8 inches deep. Structure is typically weak medium subangular blocky. Color is typically pale brown (10YR 6/3), brown (10YR 4/3) moist. An ochric horizon extends to a depth of 8 inches. An ochric horizon typically extends to a depth of 2 to 10 inches. The ochric horizon is a surface horizon lacking fine stratification and which is either light colored, or thin, or has a low organic carbon content, or is massive and (very) hard when dry. The A horizon would be expected to be more strongly developed under plant canopies. It is important if you are sampling to observe the A horizon under plant canopies as well as the interspaces.

10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:** Bunchgrasses and shrubs equally important for increasing infiltration and reducing runoff.
- Litter plays a role in increasing infiltration and decreasing runoff. Plants provide microhabitat for seedlings, catch litter and soil, and slow raindrops and runoff. Vascular plants and/or well-developed biological soil crusts (where present) will break raindrop impact and splash erosion. Spatial distribution of vascular plants and interspaces between well-developed

biological soil crusts (where present) provide 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. When perennial grasses decrease, reducing ground cover and increasing bare ground, runoff is expected to increase and any associated infiltration reduced. Shrubs catch snow, slow wind evaporation, and provide microhabitat for seedling establishment.

11. **Presence and thickness of compaction layer (usually none; describe soil profile features which may be mistaken for compaction on this site):** None. Lithic contact (the boundary with hard bedrock) may occur at about 17 inches. Naturally occurring soil horizons may be harder than the surface because of an accumulation of calcium carbonate and should not be considered as compaction layers.
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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: littleleaf mountain mahogany

Sub-dominant: Indian ricegrass > black sagebrush > bluebunch wheatgrass

Other: other shrubs > other grasses > trees

Additional:

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 bunchgrass and shrub mortality may occur during severe droughts, particularly on the shallower and coarser soils associated with this site.
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14. **Average percent litter cover (%) and depth (in):** Litter cover includes litter under plants. Most litter will be fine litter. Depth should be 1-2 leaf thickness in the interspaces and up to 1/2" under canopies. Litter cover may increase to 30-40% 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):** 375#/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.

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 and annual weeds

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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.
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