

Ecological site R028AY418UT

Mountain Loam (Bigtooth Maple)

Accessed: 05/13/2025

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.

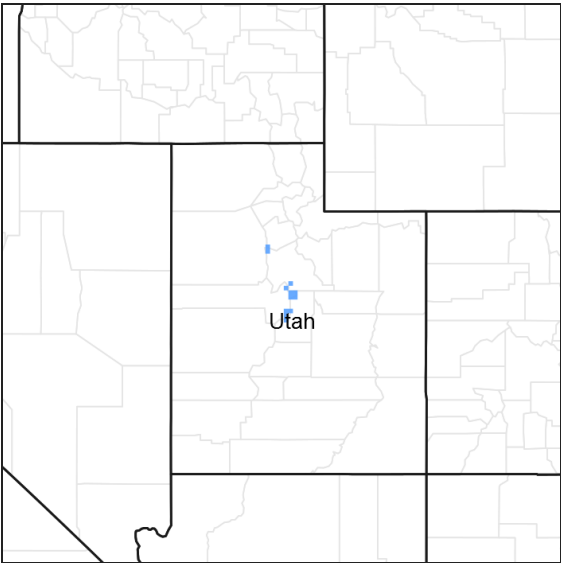


Figure 1. Mapped extent

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

R028AY310UT	Upland Loam (Bonneville Big Sagebrush) North
R028AY334UT	Upland Stony Loam (Wyoming Big Sagebrush) This site is also a competing site with differentiae.

Table 1. Dominant plant species

Tree	(1) <i>Acer grandidentatum</i>
Shrub	Not specified
Herbaceous	Not specified

Physiographic features

This site occurs in drainages on the west facing slopes at lower elevations and north and west facing slopes at upper elevations.

Table 2. Representative physiographic features

Landforms	(1) Mountain slope
-----------	--------------------

Elevation	1,524–1,829 m
Slope	15–35%
Aspect	W, NW

Climatic features

The climate is cold and snowy in the winter and warm and dry in the summer. Approximately 55 percent of the precipitation comes as snow from October through March. On the average July and August are the driest months and March through May are the wettest months.

Mean Annual Air Temperature: 42-43

Mean Annual Soil Temperature: 32-47

Table 3. Representative climatic features

Frost-free period (average)	0 days
Freeze-free period (average)	110 days
Precipitation total (average)	432 mm

Influencing water features

Soil features

The soil is deep over bedrock and well drained. It formed in alluvium and colluvium derived mainly from quartzite parent materials. The surface horizon is loam in texture and about eight inches thick. Three percent of the soil surface is covered by rock fragments. The volume of rock fragments in the soil profile is 0 to 25 percent. This site is found in draws, canyons, and large depressions that get receive extra water from run-in.

The water supplying capacity is 14 to 19 inches.

Table 4. Representative soil features

Surface texture	(1) Loam
Drainage class	Well drained
Surface fragment cover <=3"	2%
Surface fragment cover >3"	2%
Subsurface fragment volume <=3" (Depth not specified)	0–25%
Subsurface fragment volume >3" (Depth not specified)	0–25%

Ecological dynamics

As ecological condition deteriorates due to overgrazing, basin wildrye, and bluebunch wheatgrass, decrease, while bigtooth maple increases.

When the potential natural plant community is burned, all perennial grasses decrease while bigtooth maple increases.

Plants most likely to invade this site are cheatgrass, annual sunflower, and flannel mullein.

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 canyon maple. The composition by air-dry weight is approximately 40 percent perennial grasses, 10 percent forbs, 30 percent shrubs and 25 percent trees.

Table 5. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Grass/Grasslike	628	964	1121
Shrub/Vine	471	723	841
Tree	392	603	701
Forb	157	241	280
Total	1648	2531	2943

Table 6. Ground cover

Tree foliar cover	15-20%
Shrub/vine/liana foliar cover	5-10%
Grass/grasslike foliar cover	5-10%
Forb foliar cover	5-10%
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	—	—	—	5-15%
>0.3 <= 0.6	—	—	5-15%	—
>0.6 <= 1.4	—	5-15%	—	—
>1.4 <= 4	—	—	—	—
>4 <= 12	15-25%	—	—	—
>12 <= 24	—	—	—	—
>24 <= 37	—	—	—	—
>37	—	—	—	—

Figure 6. Plant community growth curve (percent production by month).
UT4182, PNC. Excellent Condition.

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	0	5	15	40	20	10	5	5	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			345–616	
	mountain big sagebrush	ARTRV	<i>Artemisia tridentata ssp. vaseyana</i>	123–247	–
	yellow rabbitbrush	CHVI8	<i>Chrysothamnus viscidiflorus</i>	74–123	–
	chokecherry	PRVI	<i>Prunus virginiana</i>	74–123	–
	mountain snowberry	SYOR2	<i>Symphoricarpos oreophilus</i>	74–123	–
3	Secondary Shrubs			74	
	Saskatoon serviceberry	AMAL2	<i>Amelanchier alnifolia</i>	25–74	–
	slender buckwheat	ERMI4	<i>Eriogonum microthecum</i>	25–74	–
Grass/Grasslike					
0	Primary Grasses			493–740	
	bluebunch wheatgrass	PSSP6	<i>Pseudoroegneria spicata</i>	370–493	–
	basin wildrye	LECI4	<i>Leymus cinereus</i>	123–247	–
1	Secondary Grasses			123–247	
	Geyer's sedge	CAGE2	<i>Carex geyeri</i>	74–123	–
	slender wheatgrass	ELTR7	<i>Elymus trachycaulus</i>	74–123	–
	slender wheatgrass	ELTRS	<i>Elymus trachycaulus ssp. subsecundus</i>	74–123	–
	prairie Junegrass	KOMA	<i>Koeleria macrantha</i>	74–123	–
	western wheatgrass	PASM	<i>Pascopyrum smithii</i>	74–123	–
	muttongrass	POFE	<i>Poa fendleriana</i>	74–123	–
	Kentucky bluegrass	POPR	<i>Poa pratensis</i>	74–123	–
	Sandberg bluegrass	POSE	<i>Poa secunda</i>	74–123	–
Forb					
2	Forbs			123–247	
	common yarrow	ACMI2	<i>Achillea millefolium</i>	25–74	–
	nettleleaf giant hyssop	AGUR	<i>Agastache urticifolia</i>	25–74	–
	arrowleaf balsamroot	BASA3	<i>Balsamorhiza sagittata</i>	25–74	–
	tapertip hawksbeard	CRAC2	<i>Crepis acuminata</i>	25–74	–
	Eaton's fleabane	EREA	<i>Erigeron eatonii</i>	25–74	–
	common motherwort	LECA2	<i>Leonurus cardiaca</i>	25–74	–
	tailcup lupine	LUCAC3	<i>Lupinus caudatus ssp. caudatus</i>	25–74	–
Tree					
4	Trees			567–863	
	bigtooth maple	ACGR3	<i>Acer grandidentatum</i>	493–740	–
	Rocky Mountain juniper	JUSC2	<i>Juniperus scopulorum</i>	74–123	–

Animal community

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

Wildlife using this site include mule deer, elk, coyote, badger, fox, ruff grouse, mourning dove, and golden eagle.

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 hydrologic group is B. The hydrologic curve number is 61 when the vegetation is in good condition.

Recreational uses

Hiking and hunting.

Wood products

Firewood, fence dancers.

Other information

Threatened and endangered species include plants and animals.

Type locality

Location 1: Box Elder County, UT	
General legal description	Found in Canyons West and South of Portage

Contributors

G. Brock Benson
GBB

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)	Jack Alexander, Range Specialist, Synergy Resource Solutions, Inc. Julia Kluck, Soil Scientist, Synergy Resource Solutions, Inc. Shane Green, State Range Specialist, Utah NRCS
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:** Very rare rills may be 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'), narrow (<1'), and meandering; interrupted by plants and exposed rocks. Slight to no evidence of erosion or deposition associated with flow patterns.
-
3. **Number and height of erosional pedestals or terracettes:** Plants may have small pedestals (1") where they are adjacent to water flow patterns, but without exposed roots. Terracettes should be few and stable. Terracettes should be small (3-6") 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.
-
4. **Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):** 15-30% 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.
-
5. **Number of gullies and erosion associated with gullies:** No gullies present.
-
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. Gravel or desert pavement protects the site from wind scour.
-
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.
-
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.
-
9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** This description is based on the soil (Hamtah), the only soil correlated with this site.
- Soil surface horizon is typically 21 inches deep. Structure is typically moderate fine and medium subangular blocky. Color is typically dark grayish brown (10YR 4/2), very dark brown (10YR 2/2) moist. Mollic epipedon is common.
-
10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:** Vascular plants and any 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. Crowns of trees and accumulating litter at base of trees appear to create a micro-topography that may enhance development of water flow patterns below the drip line of the canopy. Significant increases in pinyon-juniper canopy reduces understory vegetation and increases runoff.

11. **Presence and thickness of compaction layer (usually none; describe soil profile features which may be mistaken for compaction on this site):** None. Naturally occurring soil horizons may be harder than the surface because of an accumulation of clay and should not be considered as compaction layers.
-

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: trees (bigtooth maple) > Cool season perennial bunchgrass, mid height (bluebunch wheatgrass)

Sub-dominant: Cool season perennial bunchgrass, tall (basin wildrye) > nonsprouting shrubs (mountain big sagebrush)

Other: other grasses > forbs > other shrubs, other trees

Additional: 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 and Russian wildrye may substitute for mid stature cool season perennial native bunchgrasses.). Biological soil crust is variable in its expression on this site and is measured as a component of ground cover. Forbs can be expected to vary widely in their expression in the plant community based upon departures from average growing conditions.

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. There may be partial mortality of individual bunchgrasses and shrubs during less severe drought. Long-lived species dominate site. Open spaces from disturbance are quickly filled by new plants through seedlings and reproductive reproduction (tillering).
-

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 40-50% following years with favorable growing conditions. Excess litter may accumulate in absence of disturbance. Vegetative production may be reduced if litter cover exceeds 40%.
-

15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):** 2250#/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, annual sunflower, and flannel mullein

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.
-