

Ecological site R043BP821MT Upland Alpine Group

Last updated: 3/01/2024
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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.

MLRA notes

Major Land Resource Area (MLRA): 043B—Central Rocky Mountains

The Central Rocky Mountains (MLRA 43B) of Montana occupy some 28,850 square miles and exist primarily in Central and SW portions of the state. The climate is extremely variable with precipitation lows of 9 to 100 inches per year and frost free days of less than 30 to over 110 days. The geology of the region is also highly variable. The combination of variable climate and geology create a complex relationship of plant communities. MLRA 43B elevations typically exist between 6000 and 12,799ft at Granite Peak (the highest point in Montana).

The Continental Divide runs through this MLRA effectively splitting its watershed to contribute to either the Missouri River to the East and the Columbia River to the West.

Ecological site concept

- Site does not receive any additional water
- Soils are
 - o Generally not saline or saline-sodic (limited extent)
 - o Moderately deep, deep, or very deep
 - o Strongly or violently effervescent within surface mineral 4"
 - o Soil is not ashly or medial textural family
 - o Stones and boulders cover less than 15% surface area or fragmental textural class
- Moisture Regime: Udic
- Temperature Regime: Cryic
- Dominant Cover: Non-forested land (typically associated with krummholz vegetation)
- Elevation Range: 5000-10000ft
- Slope Range: 0-70%

Site Development and Testing Plan

This Provisional Ecological Site Description was developed to meet the criteria as defined in Soil Survey National Instruction part 306 (430-306-NI, April 2015) as interpreted by Regional Ecological Site Specialist. Information in this description are first approximations based on broad groupings of soil properties and vegetation characteristics associated with those groupings. Although this description has been through the quality control and quality assurance review process it has not been certified for use in conservation planning.

Associated sites

R043BP823MT	Shallow Alpine Group The Shallow Alpine is a neighboring site that exists higher on the landscape. The Shallow Alpine and the Upland Alpine share similar plant communities and state and transition models however, the Upland Alpine Site will produce higher amounts annual production.
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Similar sites

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Table 1. Dominant plant species

Tree	(1) <i>Pinus albicaulis</i> (2) <i>Abies lasiocarpa</i>
Shrub	(1) <i>Vaccinium scoparium</i> (2) <i>Arctostaphylos uva-ursi</i>
Herbaceous	(1) <i>Poa alpina</i> (2) <i>Dryas</i>

Physiographic features

Site exists in the upper third of the landscape and is typically on the ridge of the mountain landscape. Slopes are nearly level to steep (approximately 70 percent) though rarely beyond 40 percent.

Table 2. Representative physiographic features

Landforms	(1) Mountains > Ridge
Runoff class	High
Elevation	1,981–3,048 m
Slope	0–70%
Aspect	Aspect is not a significant factor

Climatic features

- Representative Value (RV) of range of Relative Effective Annual Precipitation: 24+ inches
- Representative Value (RV) of range of Frost-Free Days: <30 days

Site does not have climate stations but often receives high amounts of precipitation though due to short growing season plant production can be very low. Very little data exists outside of raster models.

Influencing water features

Site is not associated with water features

Wetland description

Not associated with wetlands

Soil features

Soils are moderately deep, deep, or very deep and are not strongly or violently effervescent within soil surface mineral 4 inches. Soils are not ashy or medial. Soil texture is variable based on local geology. Parent material is colluvium and residuum

Table 3. Representative soil features

Parent material	(1) Colluvium–igneous, metamorphic and sedimentary rock (2) Residuum–igneous, metamorphic and sedimentary rock
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Surface texture	(1) Loam (2) Sandy loam (3) Coarse sandy loam
Drainage class	Well drained to excessively drained
Depth to restrictive layer	51 cm
Soil depth	51 cm
Surface fragment cover <=3"	0–23%
Surface fragment cover >3"	0–12%
Available water capacity (0-101.6cm)	4.06–16.26 cm
Soil reaction (1:1 water) (0-25.4cm)	5.6–7.8
Subsurface fragment volume <=3" (25.4-50.8cm)	0–33%
Subsurface fragment volume >3" (25.4-50.8cm)	0–21%

Ecological dynamics

Upland Alpine 43B (R043BP821MT)

1 - Reference State

1.1 Reference Community Phase: Short-stature grasses (typically bluegrasses), sedges, forbs (Dryas) and shrubs share nearly equal dominance of this site. Grouse whortleberry, bearberry and creeping juniper are most common shrubs. Minimal tree cover is present, and commonly occurs as krummholz limber pine, whitebark pine, and subalpine fir. Community is resistant to most disturbance (ie fire, grazing) due to remote locations and rocky nature of soil.

T1A Vegetation removal due to catastrophic event; namely fire, however, drought, climate change, and grazing may occur.

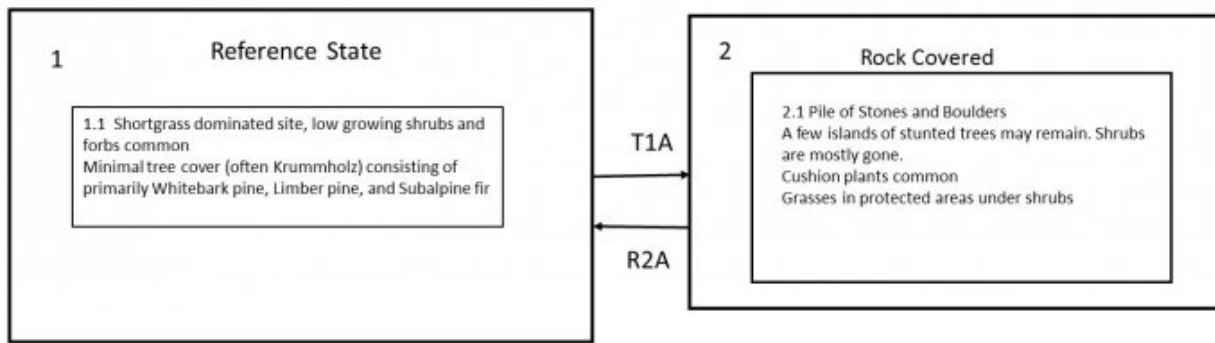
2 - Rock Covered State

2.1 Plant community is generally devoid of most species due to extreme fire. Grasses and fire resistant shrubs remain. Few trees remain as seed source for future communities.

R2A Time and stability for vegetation to re-establish

State and transition model

43B Upland Alpine



Upland Alpine 43B (R043BP821MT)

1.1 Reference Community Phase: Shortgrasses (typically bluegrasses), sedges, forbs (*Dryas* sp) and shrubs share nearly equal dominance of this site. Grouse whortleberry, Bearberry and creeping juniper are most common shrubs. Minimal tree cover in form of Krummholz Limber pine, Whitebark pine, and Subalpine fir. Community is resistant to most disturbance (ie fire, grazing) due to remote locations and rocky nature of soil

T1A Vegetation removal due to catastrophic event; namely fire however drought, climate change, grazing may occur.

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Animal community

Site is generally considered poor to good for livestock grazing due to remoteness and low production. Site considered good to excellent wildlife habitat

Recreational uses

hunting, hiking, camping, landscape viewing

Wood products

Site does not produce reliable timber. Trees, if present, are small and of little to no commercial value

Inventory data references

Information presented was derived from NRCS inventory data, literature, field observations, and personal contacts with range-trained personnel (i.e., used professional opinion of agency specialists, observations of land managers, and outside scientists).

Other references

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Contributors

Petersen, Grant

Approval

Kirt Walstad, 3/01/2024

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)	
Contact for lead author	
Date	05/13/2025
Approved by	Kirt Walstad
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

Indicators

1. **Number and extent of rills:**

2. **Presence of water flow patterns:**

3. **Number and height of erosional pedestals or terracettes:**

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

5. **Number of gullies and erosion associated with gullies:**

6. **Extent of wind scoured, blowouts and/or depositional areas:**

7. **Amount of litter movement (describe size and distance expected to travel):**

8. **Soil surface (top few mm) resistance to erosion (stability values are averages - most sites will show a range of values):**

9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):**

10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:**

11. **Presence and thickness of compaction layer (usually none; describe soil profile features which may be mistaken for compaction on this site):**

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:

Sub-dominant:

Other:

Additional:

13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):**

14. **Average percent litter cover (%) and depth (in):**

15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):**

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:**

17. **Perennial plant reproductive capability:**
