USDA Natural Resources Conservation Service

Ecological site F043BP909MT
Upland Cold Woodland Group

Last updated: 3/01/2024
Accessed: 05/02/2024

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.

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
• Dominant Cover: Coniferous Forest
• Soils are
o Generally not saline or saline-sodic (limited extent)
o Moderately deep, deep, or very deep
o Typically less than 5% stone and boulder cover (<15% max)
• Soil surface texture ranges from sandy loam to clay loam in surface mineral 4”
• Site Landform: mountain slopes, ridges, escarpments
• Area of rugged mountain, hills, plateaus, and valleys of the Central Rocky Mountains in Southwest Montana.
• Parent material is colluvium, colluvium over residuum, residuum
• Moisture Regime: ustic to udic
• Temperature Regime: cryic
• Elevation Range: 6300-10000ft
• Slope: 0-65% (typically less than 35%)

Associated sites

F043BP902MT	**Shallow Cold Woodland Group** The Upland Cold Woodland site is adjacent to the Shallow Cold Woodland however tending to be lower on the landscape where soils tend to be deeper. These two sites share similar plant communities and state and transition models.

Similar sites

F043BP902MT	**Shallow Cold Woodland Group** The Upland Cold Woodland site is adjacent to the Shallow Cold Woodland however tending to be lower on the landscape where soils tend to be deeper. These two sites share similar plant communities and state and transition models.

Table 1. Dominant plant species

Tree	(1) *Abies lasiocarpa*
Shrub	(1) *Symphoricarpos* (2) *Menziesia ferruginea*
Herbaceous	(1) *Calamagrostis rubescens* (2) *Arnica*

Physiographic features

Site exists on a variety of landforms in the mountains including mountain slopes, ridges, and escarpments. Slopes are variable from 1 to 65 percent but are typically less than 35 percent. Site is commonly located on the middle to upper third of the landscape.

Table 2. Representative physiographic features

Landforms	(1) Mountains > Mountain slope (2) Mountains > Escarpment (3) Mountains > Ridge
Runoff class	Negligible to medium
Flooding frequency	None
Elevation	4,500–10,000 ft
Slope	1–90%
Water table depth	100 in
Aspect	W, NW, N, NE, E, SE, S, SW

Climatic features

This site exists in areas that do not have climate stations. Information is derived from plant indicators and computer model estimates. The climate of this site tends to be cold and wet; receiving up to 80 inches of precipitation, though uncommon. Typical precipitation ranges are from 20 to 50 inches with 10 to 60 frost-free days. A majority of the precipitation on this site comes from winter snowfall.

Table 3. Representative climatic features

Frost-free period (characteristic range)	10-60 days
Freeze-free period (characteristic range)	
Precipitation total (characteristic range)	20-50 in
Frost-free period (average)	40 days
Freeze-free period (average)	
Precipitation total (average)	30 in

Influencing water features

Site is not associated with water resources. Snowpack from this site directly contributes to stream flows; however, concentrated flows are rarely seen

Wetland description

n/a

Soil features

Soils are formed from colluvium, colluvium over residuum, or residuum. Textures will vary based on local geology but tend to be silt loam to sandy loam with mixed amounts of rock fragments in the soil profile. Gravelly soil texture modifier is very common.

Table 4. Representative soil features

Parent material	(1) Colluvium–igneous, metamorphic and sedimentary rock (2) Residuum–igneous, metamorphic and sedimentary rock
Surface texture	(1) Gravelly loam (2) Gravelly sandy loam (3) Silt loam
Drainage class	Well drained
Permeability class	Moderately slow to moderately rapid
Depth to restrictive layer	20 in
Soil depth	20–100 in
Surface fragment cover <=3"	0–10%
Surface fragment cover >3"	0–5%
Available water capacity (0-40in)	2.3–6.7 in
Soil reaction (1:1 water) (0-20in)	4.6–7.8
Subsurface fragment volume <=3" (10-20in)	0–30%
Subsurface fragment volume >3" (10-20in)	0–25%

Ecological dynamics

1 - Reference State
1.1 Subalpine Fir dominated forest with limited Douglas fir and lodgepole pine. Community relatively resilient.

T1A Post-disturbance includes stand replacement fire, insect pestilence and disease. Fire frequency is long but fire is intense.

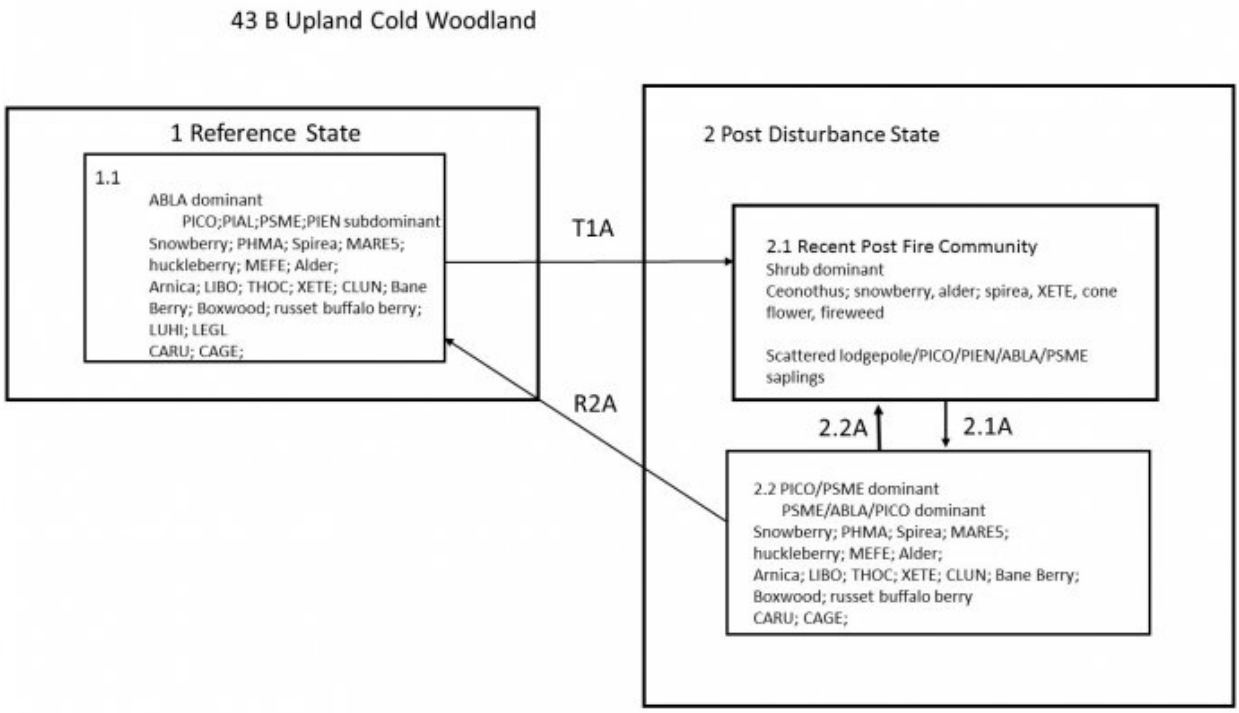
2 - Post-disturbance State
2.1 Post-fire shrub dominant community with saplings of lodgepole pine being common. Fireweed dominant forb. Grasses may increase outside of fireweed patches

2.1A Time where trees start to re-establish

2.2 Post-fire forest dominated by lodgepole pine with Douglas fir and Englemann's spruce increasing. Shrubs and grasses returning to pre-fire positions.

2.2A Community phase shift is due to fire, insect pestilence and disease. Fire frequency is long but fire is intense.
R2A Restoration pathway where the site, over time, without fire, insect pestilence, or disease moves back to the Reference State. Subalpine fir comes back in and shades out the other tree species. This process takes over 150 years.

State and transition model



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Animal community

This ecological site is considered important habitat for large game animals such as deer, elk, and moose as well as upland birds such as ruffed, dusky, and spruce grouse.

This site is considered margin for livestock grazing; however, if the tree canopy is open it is grazeable.

Recreational uses

Site frequently used by many outdoor recreationists such as bird watchers, campers, hikers, bikers, and hunters.

Wood products

The dominant forest type is typically not suited for forest products; however, subordinate species such as Douglas fir and lodgepole pine have many uses. Harvest of this site will prove challenging because of being located on the middle to upper third of the landscape.

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

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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	05/02/2024
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):

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

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

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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):**

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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:

    Sub-dominant:

    Other:

    Additional:

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

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

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

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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:**

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17. **Perennial plant reproductive capability:**
