

# Ecological site F044AP903MT Upland Cool Woodland Group

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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): 044A–Northern Rocky Mountain Valleys

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This MLRA includes the northern portion of the Northern Rocky Mountain Valleys Province of the Rocky Mountain System. The mountain valleys are deeply dissected and are typically bordered by mountains trending north to south. The nearly level broad flood plains are bordered by gently to strongly sloping terraces and alluvial fans. The surrounding mountains and in some areas the valleys experienced glaciation. The average precipitation is 12 to 16 inches generally, though can vary widely. The dominant soil orders are Inceptisols, Mollisols and Andisols. The valleys support coniferous forests, shrublands and grasslands.

Description of MLRAs can be found in: United States Department of Agriculture, Natural Resources Conservation Service. 2006. Land Resource Regions and Major Land Resource Areas of the United States, the Caribbean, and the Pacific Basin. U.S. Department of Agriculture Handbook 296.

Available electronically at: [http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/ref/?cid=nrcs142p2\\_053624#handbook](http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/ref/?cid=nrcs142p2_053624#handbook)

## Classification relationships

ASSOCIATED HABITAT TYPES:

PSME/PHMA5-CARU

ABGR/LIBO3

## Ecological site concept

- Site does not receive any additional water
- Dominant Cover: Coniferous Forest

The reference vegetation community is closed canopy overstory of either Douglas fir with an understory of the medium statured shrub ninebark or Grand fir with an understory of the low statured twinflower. There is a diversity of other shrub and herbaceous species that can be present. Understory production averages 600 dry pounds per acre. The ecological dynamics are similar if the overstory is of Grand fir.

- Soils are

- o Generally not limy (limited extent)
- o Moderately deep, deep or very deep
- o Not ashy or medial textural family
- o Typically less than 5% stone and boulder cover (<15% max)

- Soil surface texture ranges from gravelly ashy silt loam or loam; ashy fine sandy loam to ashy loam in surface mineral 4"

- Parent material is thin mixed volcanic ash over alluvium, colluvium, glacial till, or glaciolacustrine deposits
- Drainage class is well drained; no flooding frequency
- Site Landform: stream terraces, lake terraces, hillslopes, mountain slopes, moraines

- Moisture Regime: ustic/xeric
- Temperature Regime: frigid
- Elevation Range: 2400-3400 ft
- Slope: 4-15%

## Associated sites

F044AP902MT	<b>Shallow Warm Woodland Group</b> This associated ecological site resides on slightly drier site conditions than this ecological site.
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## Similar sites

F044AF004MT	<b>Montane Moderately Warm Dry Coniferous Pend Oreille-Kootenai Valleys Douglas fir/common snowberry</b> The similar ecological site is limited to the LRU in the western most of portion of the MLRA.
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**Table 1. Dominant plant species**

Tree	(1) <i>Pseudotsuga menziesii</i> var. <i>glauca</i> (2) <i>Abies grandis</i>
Shrub	(1) <i>Physocarpus malvaceus</i> (2) <i>Linnaea borealis</i>
Herbaceous	(1) <i>Calamagrostis rubescens</i> (2) <i>Festuca idahoensis</i>

## Physiographic features

**Table 2. Representative physiographic features**

Landforms	(1) Valley > Hill (2) Valley > Moraine (3) Valley > Stream terrace (4) Valley > Lake terrace
Elevation	2,400–3,400 ft
Slope	4–15%
Water table depth	60 in
Aspect	W, NW, N, NE, E, SE, S, SW

## Climatic features

- Moisture Regime: ustic/xeric
- Temperature Regime: frigid
- Representative Value (RV) of range of Mean Annual Precipitation: 18-25 inches
- Representative Value (RV) of range of Mean Average Annual Temperature: 43-45 degrees
- Representative Value (RV) of range of Frost Free Days: 90-105 days

**Table 3. Representative climatic features**

Frost-free period (characteristic range)	59-103 days
Freeze-free period (characteristic range)	107-140 days
Precipitation total (characteristic range)	12-28 in
Frost-free period (actual range)	22-117 days
Freeze-free period (actual range)	53-145 days
Precipitation total (actual range)	11-34 in

Frost-free period (average)	75 days
Freeze-free period (average)	113 days
Precipitation total (average)	20 in

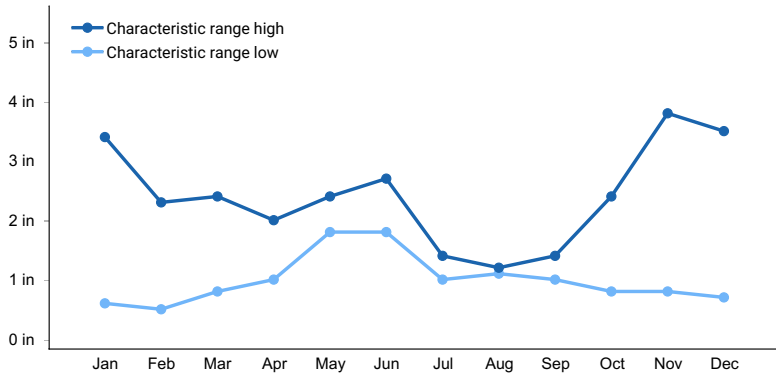


Figure 1. Monthly precipitation range

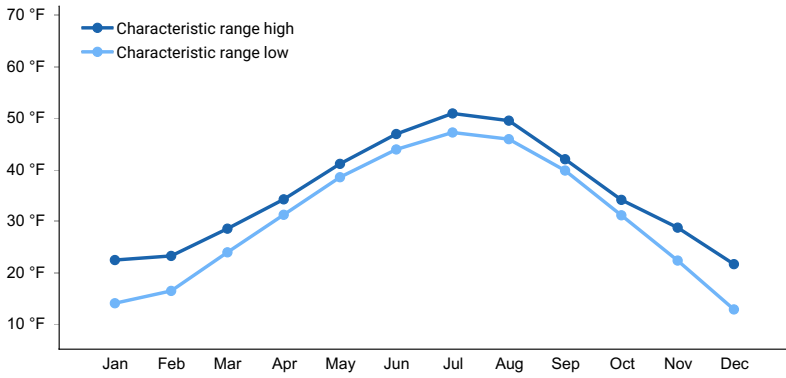


Figure 2. Monthly minimum temperature range

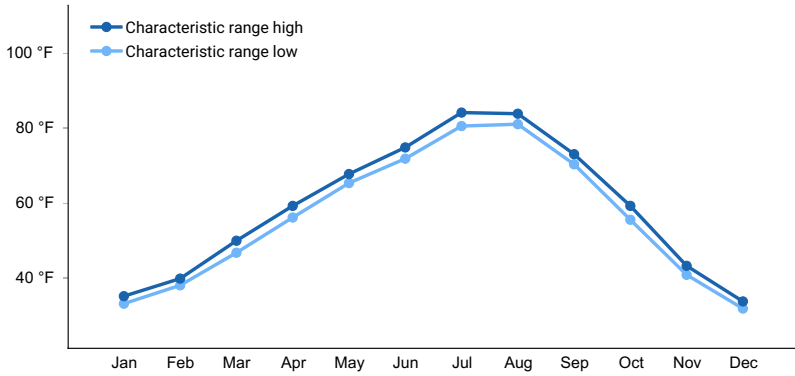


Figure 3. Monthly maximum temperature range

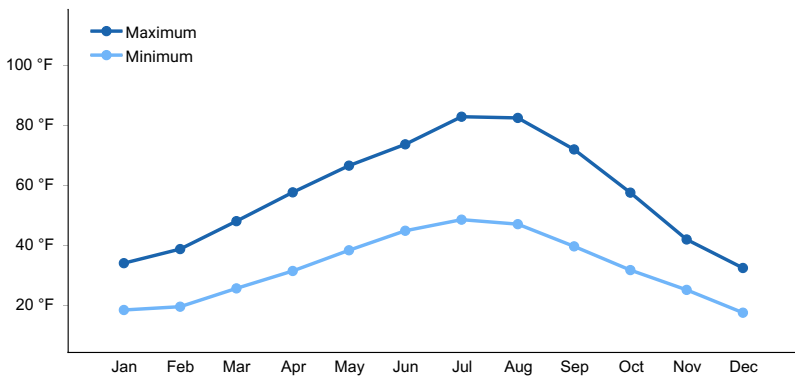
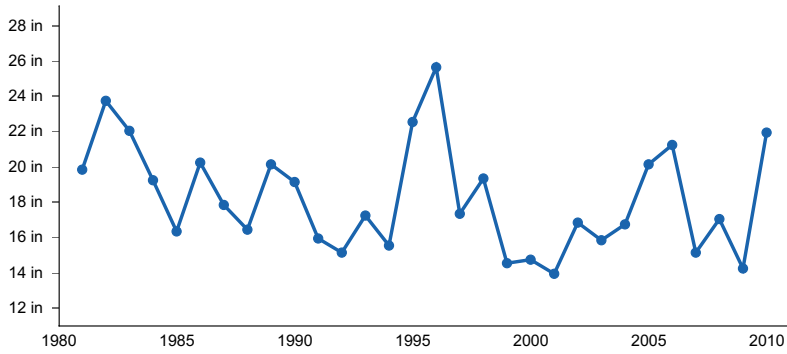
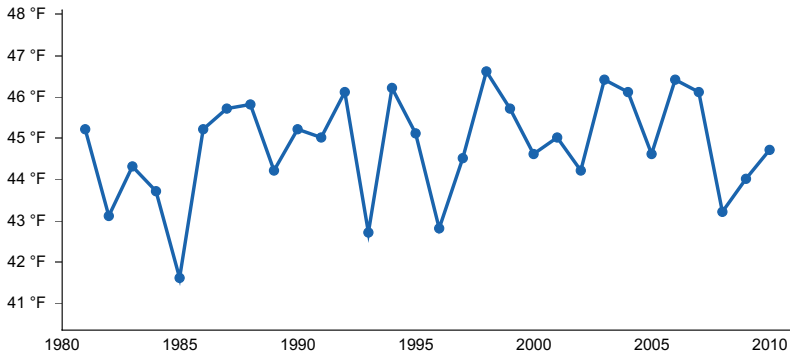


Figure 4. Monthly average minimum and maximum temperature



**Figure 5. Annual precipitation pattern**



**Figure 6. Annual average temperature pattern**

### Climate stations used

- (1) ENNIS [USC00242793], Ennis, MT
- (2) STEVENSVILLE [USC00247894], Stevensville, MT
- (3) WISDOM [USC00249067], Wisdom, MT
- (4) TOWNSEND [USC00248324], Townsend, MT
- (5) KALISPELL 9 NNE [USC00244560], Kalispell, MT
- (6) POLSON KERR DAM [USC00246640], Polson, MT
- (7) BONNERS FERRY [USC00101079], Bonners Ferry, ID
- (8) SANDPOINT EXP STN [USC00108137], Sandpoint, ID
- (9) BAYVIEW MODEL BASIN [USC00100667], Athol, ID
- (10) HERON 2 NW [USC00244084], Heron, MT
- (11) TROUT CREEK RS [USC00248380], Trout Creek, MT

### Influencing water features

NO WATER FEATURES

- Site does not receive any additional water

### Wetland description

DOES NOT APPLY

### Soil features

- Soils are
  - o Generally not limy (limited extent)
  - o Moderately deep, deep or very deep
  - o Not ashy or medial textural family
  - o Typically less than 5 percent stone and boulder cover (less than 15 percent max)
- Soil surface texture ranges from gravelly ashy silt loam or loam; ashy fine sandy loam to ashy loam in surface mineral 4 inches

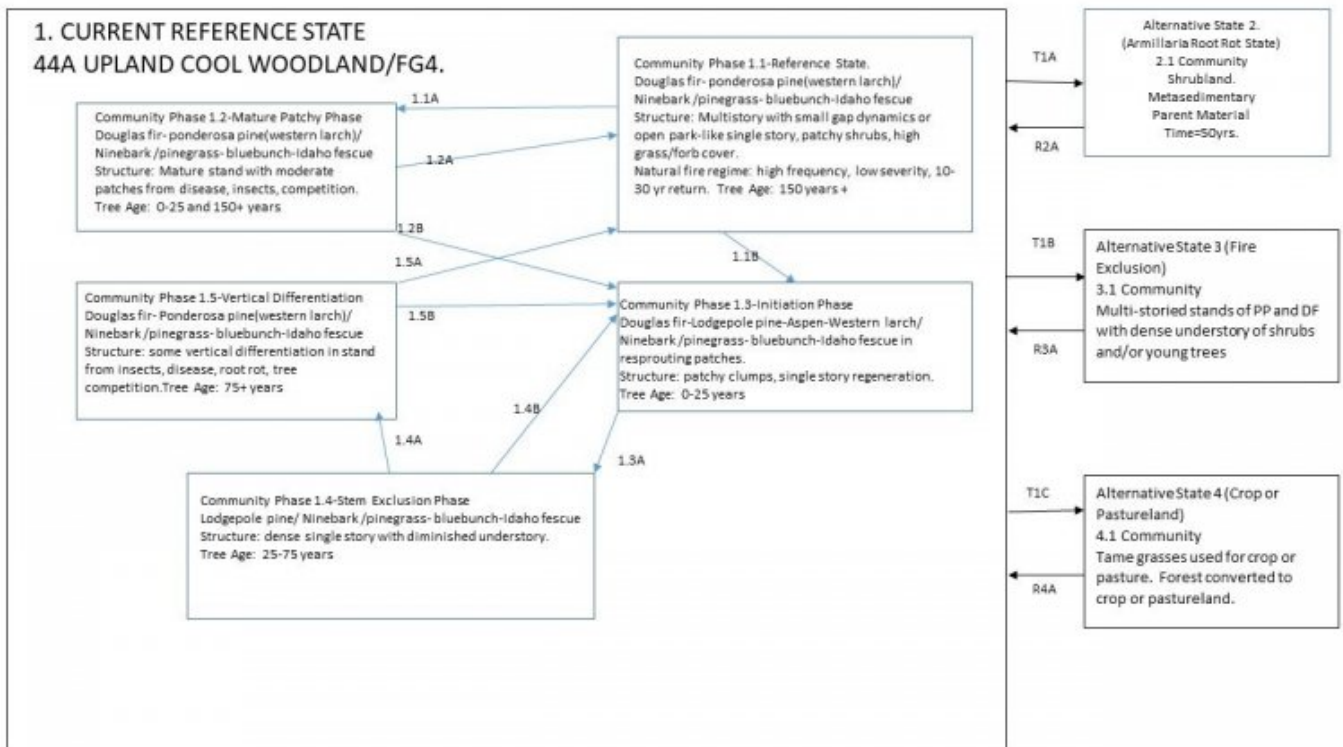
- Parent material is thin mixed volcanic ash over alluvium, colluvium, glacial till, or glaciolacustrine deposits
- Drainage class is well drained; no flooding frequency

**Table 4. Representative soil features**

Parent material	(1) Alluvium (2) Colluvium (3) Till (4) Glaciolacustrine deposits (5) Volcanic ash
Surface texture	(1) Gravelly, ashy silt loam (2) Gravelly, ashy loam (3) Ashy fine sandy loam (4) Ashy loam
Drainage class	Well drained
Soil depth	20–60 in
Surface fragment cover <=3"	0%
Surface fragment cover >3"	0–15%

## Ecological dynamics

### State and transition model



## Legend

### Pathways

- 1.1A – Moderate sized patches of tree mortality due to fire, insect, disease, windthrow.
- 1.1B – Stand replacement disturbance. Severe Fire or insect mortality killing large pine/fir.
- 1.2A – Time and infilling of moderate sized patches with trees to a reference stand of multistory stand.
- 1.2B – Stand replacement disturbance. Severe Fire or insect mortality killing large pine/fir, return to initiation phase.
- 1.3A – Time with fire return interval extended to allow natural tree regeneration to grow into dense pole stands
- 1.4A – Time without fire to allow vertical differentiation of stand through small gaps from death due to disease, insects, small fires, windthrow.
- 1.4B – Stand replacing severe fire that returns the stem exclusion phase forest to the initiation phase
- 1.5A – Time with no major disturbance to transition to the reference phase community
- 1.5B – Stand replacing severe fire that returns the vertical differentiation phase to the initiation community

### Transitions

- T1A – Armillaria Root Rot State in which the forest has been converted to a shrubland
- T1B - Fire exclusion over long periods allowing stands to grow into homogenous multi-storied stands
- T1C – Forest stands converted to cropland or pastureland
- R2A – Forest management practices to convert shrubland back to forest including tree planting of less Armillaria Root Rot sensitive tree species
- R3A – Forest stands restored by overstory thinning, ground and ladder fuels reduction, prescribed fire and seeding of native grasses and forbs.
- R4A – Afforestation through planting of native trees /shrubs and seeding of native grasses and forbs, treatment of invasive plants and time.

## Animal community

### Pinegrass dominated areas:

In areas dominated by pinegrass, very palatable bunchgrasses cover is low and therefore forage production is low. Use by horses and cattle on gentler slopes. In areas with undergrowth dominated by bunchgrasses, bluebunch wheatgrass and rough fescue, the livestock grazing potential is moderate due to the palatability of these species. Moderate use by deer and elk in winter throughout this site.

### Ninebark dominated areas:

Deer, elk and commonly moose use this site heavily in winter particularly in areas with high cover of pinegrass. Areas with ninebark can afford good browse for wildlife. Limited use for livestock, due to low cover of highly palatable grass species.

## Hydrological functions

Native pinegrass serves to hold water in the soil, therefore if there is significant reduction in native, perennial grass species there will be less soil water available for plants. This usually occurs with an increase in annual non-native plants.

## Recreational uses

## Wood products

Pinegrass dominated areas:

In the pinegrass dominated undergrowth areas of this site, timber production is low to moderate and site preparation and timber management must include scarification of thick sod-forming pinegrass in order to allow tree regeneration.

In areas that are low elevation, on sunny exposures with open growth, low tree canopy cover and undergrowth dominated by bunchgrasses, timber production is very low to low, and tree regeneration can be impeded by thick cover of bunchgrass

Ninebark dominated areas:

Timber productivity ranges from moderate to high since site index is high and slopes are not limiting; and there are a variety of seral tree species present in seral phases and various management practices available.

In areas with high cover of pinegrass in the understory, management practices must consider site preparation to reduce grass cover for tree regeneration. In areas dominated by ninebark, site preparation must be considered.

## Other references

Pfister, Robert D., et al. "Forest habitat types of Montana." Gen. Tech. Rep. INT-GTR-34. Ogden, UT: US Department of Agriculture, Forest Service, Intermountain Forest & Range Experiment Station. 174 p. 34 (1977).

## Contributors

Jay Skovlin  
Stephanie Shoemaker

## Approval

Kirt Walstad, 9/07/2023

## 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	04/19/2024
Approved by	Kirt Walstad
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

## Indicators

1. **Number and extent of rills:**
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2. **Presence of water flow patterns:**

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

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

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

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

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

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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):**

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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:**

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