USDA Natural Resources
Conservation Service

Ecological site F044AP904MT
Upland Cool Moist Woodland Group

Last updated: 9/07/2023
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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

Classification relationships

ASSOCIATED HABITAT TYPE:
WESTERN HEMLOCK/QUEENCUP BEADLILY
WESTERN REDCEDAR/QUEENCUP BEADLILY

Ecological site concept

• Site does not receive any additional water
• Dominant Cover: Coniferous Forest
The reference vegetation community is either a pure or mixed stand of western redcedar and/or western hemlock. The understory is generally low to moderate canopy cover of diverse shrubs and herbaceous species with low to moderate moss cover on the ground. Understory average production is 1800 dry pounds per acre, but ranges very widely from 200 pounds per acre to some seral phase communities with high production in grass species.
• 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 ashy silt loam or gravelly ashy silt loam in surface mineral 4”
• Parent material is mixed volcanic ash over alluvium, outwash or glaciolacustrine deposits
• Drainage class is well drained; no flooding frequency
• Site Landform: stream terraces, outwash terraces, lake terraces, lake plains, moraines
• Moisture Regime: udic

• Temperature Regime: frigid
• Elevation Range: 2200-2700 ft
• Slope: 4-15%

Associated sites

F044AP901MT	**Ashy Cool Moist Woodland Group** This associated ecological site resides in slightly drier site conditions.

Similar sites

F044AF006MT	**Lower Subalpine Moderately Cool and Moist Coniferous Pend Oreille-Kootenai Valleys western redcedar-western hemlock/bride's bonnet** This similar site to this ecological site in site conditions and the overstory is dominated by western redcedar and western hemlock, but it is limited to the LRU in the most western extent of this MLRA.

Table 1. Dominant plant species

Tree	(1) *Thuja plicata* (2) *Tsuga heterophylla*
Shrub	(1) *Taxus brevifolia* (2) *Paxistima myrsinites*
Herbaceous	(1) *Clintonia uniflora* (2) *Moss*

Physiographic features

Table 2. Representative physiographic features

Landforms	(1) Mountains > Moraine (2) Valley > Lake plain (3) Valley > Stream terrace (4) Valley > Outwash terrace (5) Valley > Lake terrace
Elevation	2,200–2,700 ft
Slope	4–15%
Water table depth	60 in
Aspect	Aspect is not a significant factor

Climatic features

• Moisture Regime: udic
• Temperature Regime: frigid
• Representative Value (RV) of range of Mean Annual Precipitation: 28-34 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)	36-103 days
Freeze-free period (characteristic range)	83-140 days
Precipitation total (characteristic range)	11-21 in
Frost-free period (actual range)	8-115 days
Freeze-free period (actual range)	47-144 days

Precipitation total (actual range)	10-34 in
Frost-free period (average)	70 days
Freeze-free period (average)	106 days
Precipitation total (average)	18 in

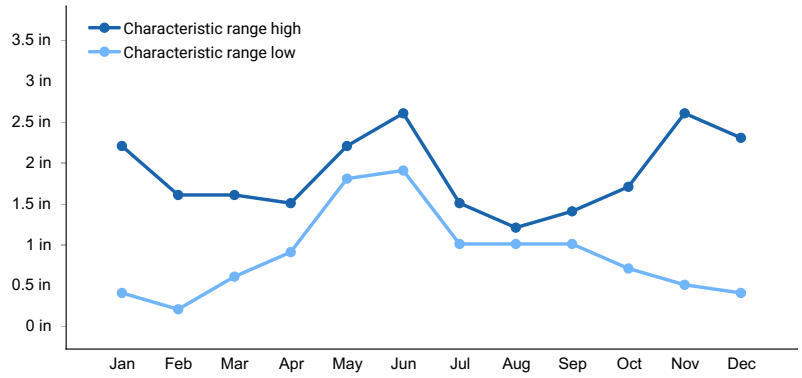


Figure 1. Monthly precipitation range

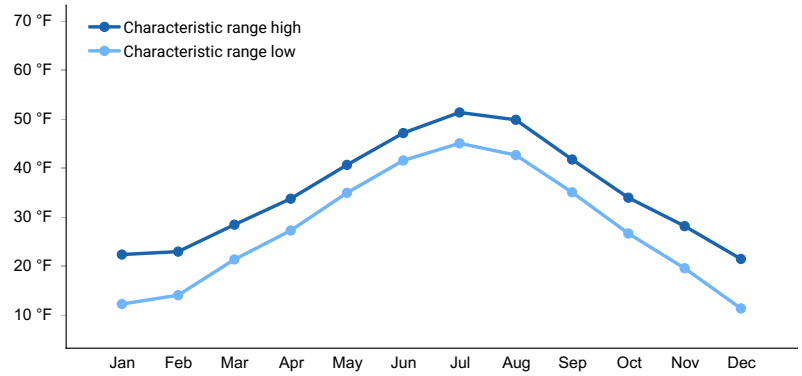


Figure 2. Monthly minimum temperature range

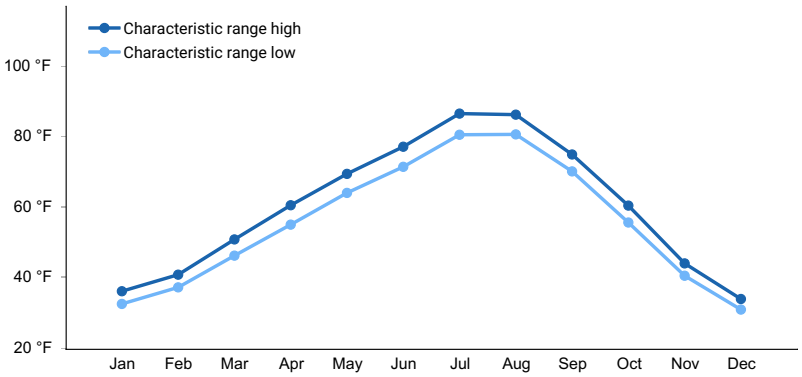


Figure 3. Monthly maximum temperature range

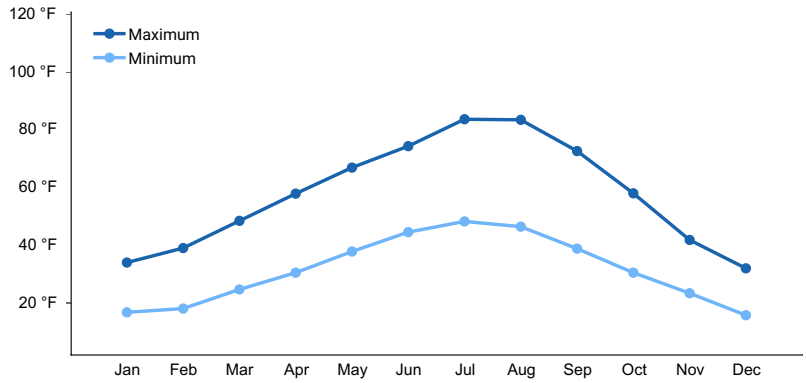


Figure 4. Monthly average minimum and maximum temperature

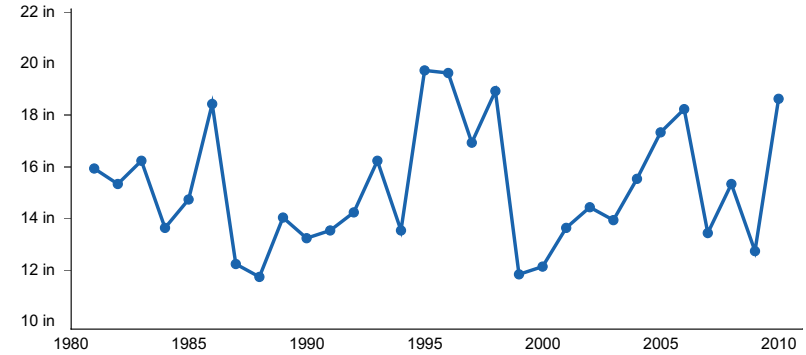


Figure 5. Annual precipitation pattern

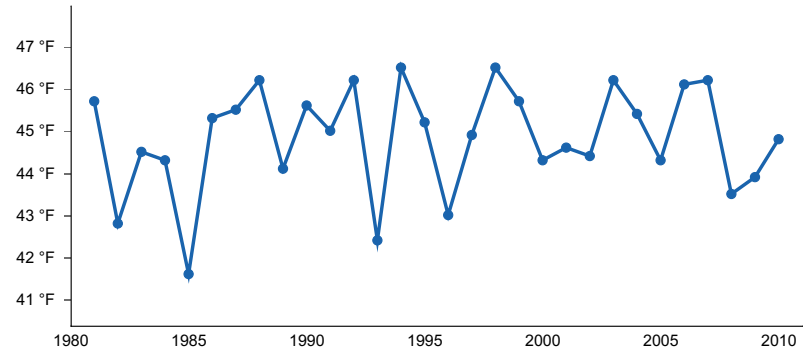


Figure 6. Annual average temperature pattern

Climate stations used

- (1) OLNEY [USC00246218], Whitefish, MT
- (2) BONNERS FERRY [USC00101079], Bonners Ferry, ID
- (3) SANDPOINT EXP STN [USC00108137], Sandpoint, ID
- (4) PLEASANT VALLEY 5 SE [USC00246580], Marion, MT
- (5) KALISPELL 9 NNE [USC00244560], Kalispell, MT
- (6) POLSON KERR DAM [USC00246640], Polson, MT
- (7) STEVENSVILLE [USC00247894], Stevensville, MT
- (8) DEER LODGE 3 W [USC00242275], Deer Lodge, MT
- (9) WISDOM [USC00249067], Wisdom, MT
- (10) DILLON AP [USW00024138], Dillon, MT
- (11) TWIN BRIDGES [USC00248430], Sheridan, MT
- (12) TOWNSEND [USC00248324], Townsend, MT
- (13) TRIDENT [USC00248363], Three Forks, MT
- (14) SAINT REGIS 1 NE [USC00247318], Saint Regis, MT
- (15) HERON 2 NW [USC00244084], Heron, MT
- (16) THOMPSON FALLS PH [USC00248211], Thompson Falls, MT

- (17) SUPERIOR [USW00024159], Superior, MT
- (18) ALBERTON [USC00240075], Alberton, 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 ashy or medial textural family
o Typically less than 5 percent stone and boulder cover (less than 15 percent max)
• Soil surface texture ashy silt loam or gravelly ashy silt loam in surface mineral 4 inches
• Parent material is mixed volcanic ash over alluvium, outwash or glaciolacustrine deposits
• Drainage class is well drained; no flooding frequency

Table 4. Representative soil features

Parent material	(1) Alluvium (2) Outwash (3) Glaciolacustrine deposits
Surface texture	(1) Ashy silt loam (2) Gravelly, ashy silt loam
Drainage class	Well drained
Soil depth	60–100 in

Ecological dynamics

LEGEND
STATE 1: Historic reference state with presence of western white pine as a major seral tree species.
Community Phase 1.1: Reference phase of multi-storied forest canopy dominated by western redcedar and western hemlock.
Community Phase 1.2: Post fire disturbance community of herb and shrub species.
Community Phase 1.3: Intermediate aged forest, dense thick pole sized trees.
Community Phase 1.4: Maturing forest phase of seral tree species and western redcedar and western hemlock.
Community Phase 1.5: Mature forest with some small gap dynamics, remnant seral trees species and western redcedar and western hemlock dominant.

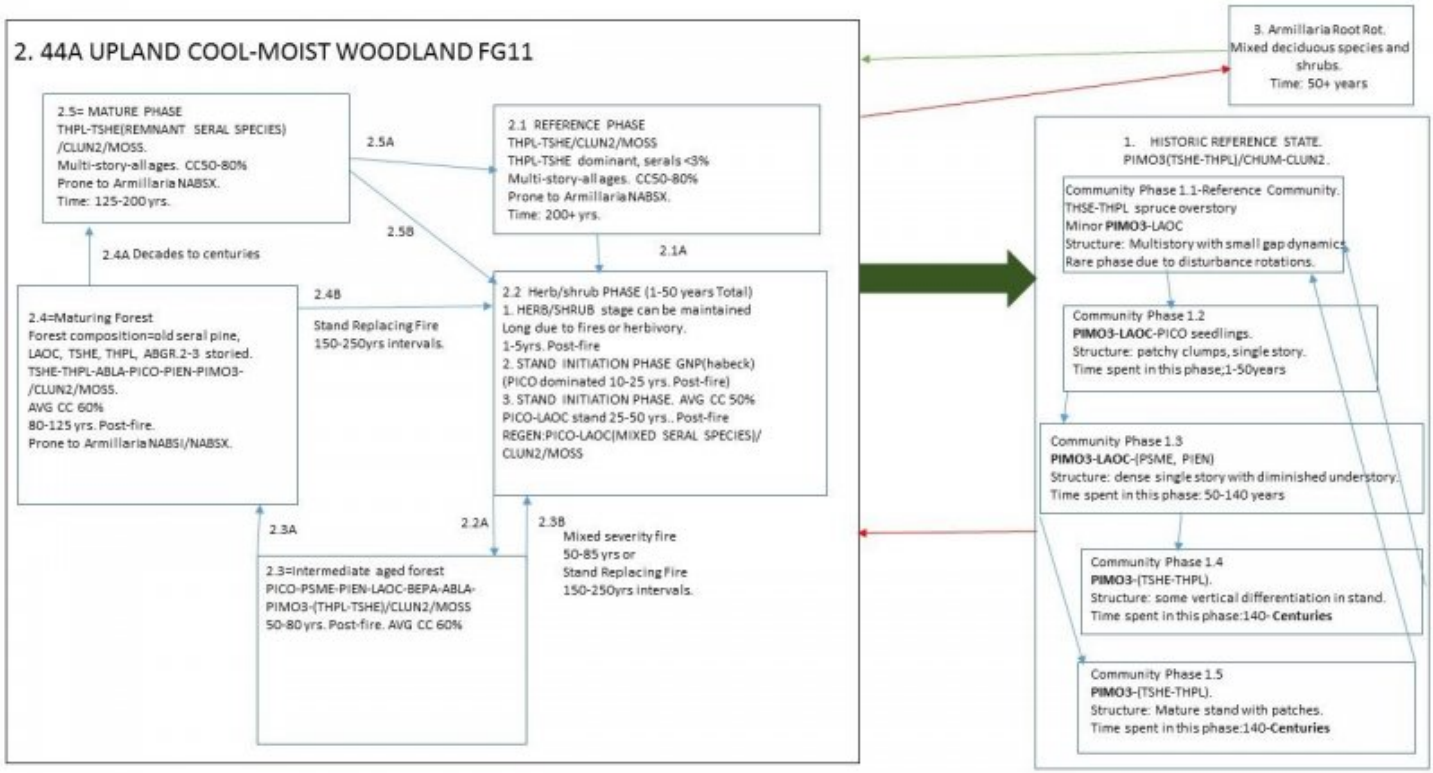
STATE 2: Current reference state with minor or none presence of western white pine as a seral tree species.
Community Phase 1.1: Reference phase of multi-storied forest canopy dominated by western redcedar and western hemlock.
Community Phase 1.2: Post fire disturbance community of herb and shrub species.
Community Phase 1.3: Intermediate aged forest, dense thick pole sized trees.
Community Phase 1.4: Maturing forest phase of seral tree species and western redcedar and western hemlock.
Community Phase 1.5: Mature forest with some small gap dynamics, remnant seral trees species and western redcedar and western hemlock dominant.

STATE 3: Armillaria root rot induced shrubland state.

Transition from State 1 to State 2: Substantial loss of western white pine as a major seral tree species.

Restoration from State 2 to State 1: Western white pine restored as a major seral tree species.
Transition from State 2 to State 3: Significant loss of susceptible tee species at a site due to Armillaria root rot and conversion of the forest to a shrubland.
Restoration from State 3 to State 2: Conversion of the Armillaria root rot induced shrubland to forest, generally of less susceptible seral tree species and eventually to climax tree species.

State and transition model



Animal community

Early seral phase has high forage potential for deer and elk, but minimal in other phases except for overwintering uses.
Livestock use is very low due to lack of palatable forage.

Hydrological functions

These sites are generally confined to bottomlands and streamsides. They act to stabilize the streambanks from soil erosion and therefore, areas of close proximity to a streamside is left unharvested (streamside leave zone).

Recreational uses

hunting, fishing, hiking, camping, photography

Wood products

These stands, especially in the seral stages, have very high timber productivity. Potential for even aged stand management and regenerates readily with adequate seed source.

Other references

Hansen, Paul L. Classification and management of Montana's riparian and wetland sites. No. 54. Montana Forest and Conservation Experiment Station, School of Forestry, The University of Montana, 1995.

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

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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	05/10/2025
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:**