Ecological site F044AP905MT
Upland Warm Woodland Group

Last updated: 9/07/2023
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): 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 TYPES:

PIPO/PUTR2/FEID
PIPO/FEID-FECA4

Ecological site concept

• Site does not receive any additional water
• Dominant Cover: Coniferous Forest
Reference vegetation community is an open overstory of ponderosa pine with an understory with a significant component of native bunchgrasses and some bitterbrush.
Understory production averages 1200 pounds per acre dry weight.
• 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 15% stone and boulder surface area (<15% max)
• Soil surface texture gravelly or cobbly or stony coarse sandy loam in surface mineral 4”
• Parent material is colluvium or outwash derived from granite and gneiss,
• Drainage class is well to excessively well drained; no flooding frequency
• Site Landform: escarpments, hillslopes, outwash fans
• Moisture Regime: ustic/xeric

• Temperature Regime: frigid
• Elevation Range: 1300-4400 ft
• Slope: 8-45%

Associated sites

F044AP902MT	**Shallow Warm Woodland Group** This associated ecological site is in moister site condition areas adjacent to this ecological site.

Similar sites

F044AH001MT	**Montane Warm Dry Coniferous Seeley, Swan, Flathead and Tobacco Valleys** This similiar site has similar dry site conditions and an overstory of ponderosa pine but is limited to the most northern centeral area of this MLRA.

Table 1. Dominant plant species

Tree	(1) *Pinus ponderosa* (2) *Pseudotsuga menziesii*
Shrub	(1) *Purshia tridentata* (2) *Arctostaphylos uva-ursi*
Herbaceous	(1) *Festuca campestris* (2) *Festuca idahoensis*

Physiographic features

Table 2. Representative physiographic features

Landforms	(1) Valley > Escarpment (2) Valley > Hillslope (3) Valley > Outwash fan
Elevation	1,300–4,400 ft
Slope	8–45%
Water table depth	60–80 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: 13-19 inches
• Representative Value (RV) of range of Mean Average Annual Temperature: 39-45 degrees
• Representative Value (RV) of range of Frost Free Days: 80-100 days

Table 3. Representative climatic features

Frost-free period (characteristic range)	37-108 days
Freeze-free period (characteristic range)	93-141 days
Precipitation total (characteristic range)	13-24 in
Frost-free period (actual range)	6-117 days
Freeze-free period (actual range)	54-145 days
Precipitation total (actual range)	12-30 in
Frost-free period (average)	71 days

Freeze-free period (average)	112 days
Precipitation total (average)	20 in

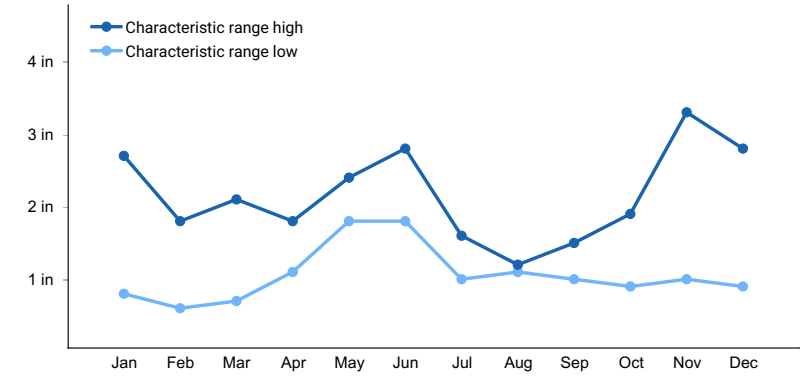


Figure 1. Monthly precipitation range

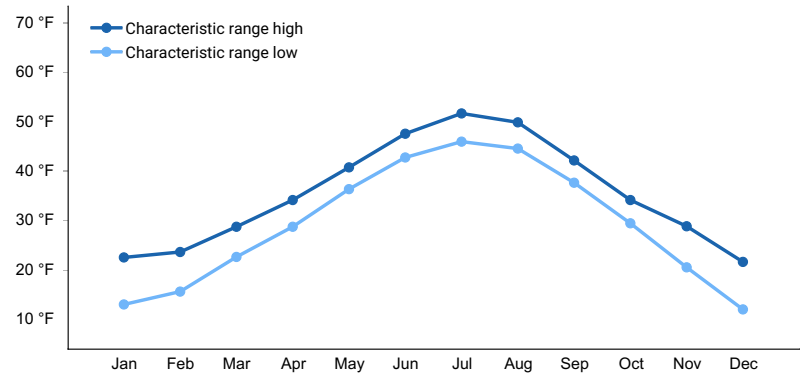


Figure 2. Monthly minimum temperature range

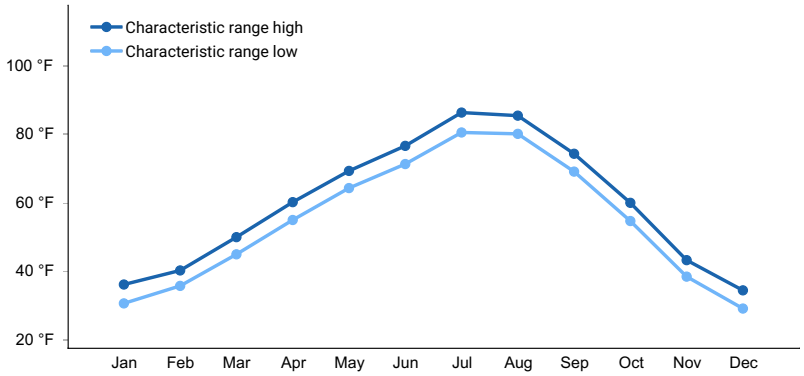


Figure 3. Monthly maximum temperature range

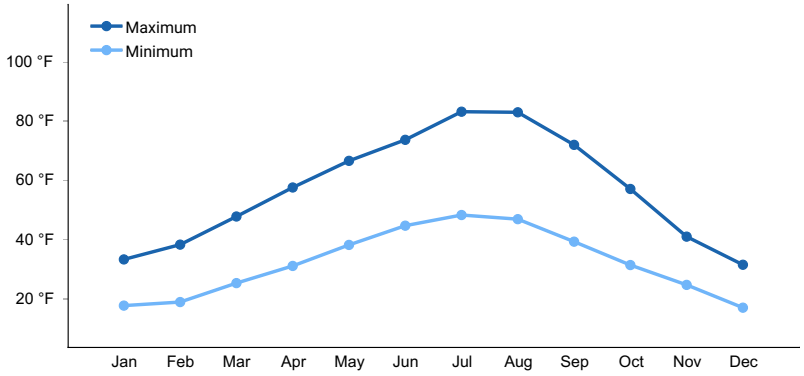


Figure 4. Monthly average minimum and maximum temperature

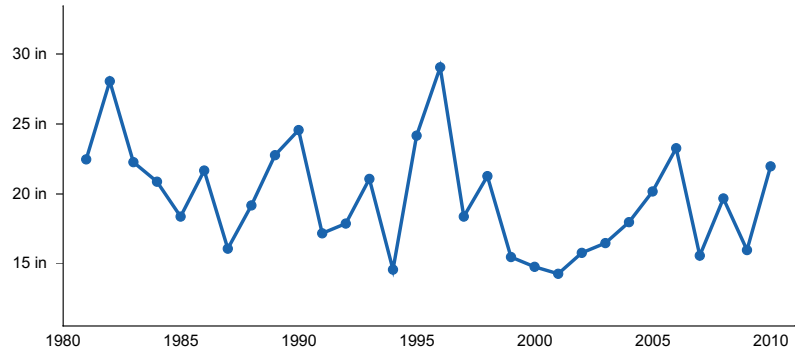


Figure 5. Annual precipitation pattern

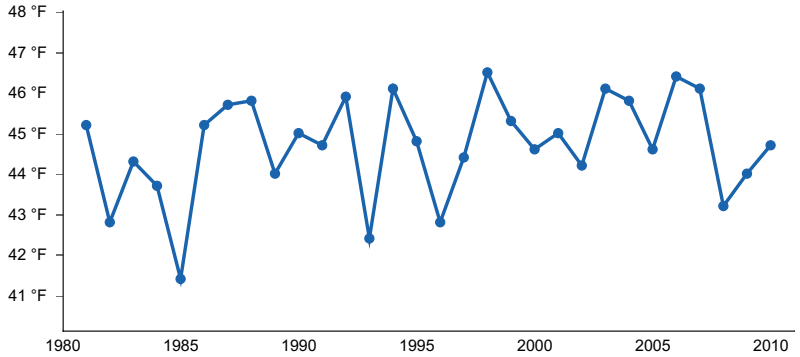


Figure 6. Annual average temperature pattern

Climate stations used

- (1) OLNEY [USC00246218], Whitefish, MT
- (2) WHITEFISH [USC00248902], Whitefish, MT
- (3) KALISPELL 9 NNE [USC00244560], Kalispell, MT
- (4) BONNERS FERRY [USC00101079], Bonners Ferry, ID
- (5) BAYVIEW MODEL BASIN [USC00100667], Athol, ID
- (6) HERON 2 NW [USC00244084], Heron, MT
- (7) TROUT CREEK RS [USC00248380], Trout Creek, MT
- (8) THOMPSON FALLS PH [USC00248211], Thompson Falls, MT
- (9) POLSON KERR DAM [USC00246640], Polson, MT
- (10) STEVENSVILLE [USC00247894], Stevensville, MT
- (11) DRUMMOND AVIATION [USW00024139], Drummond, MT
- (12) WISDOM [USC00249067], Wisdom, MT
- (13) TRIDENT [USC00248363], Three Forks, 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 15 percent stone and boulder surface area (less than 15 percent max)

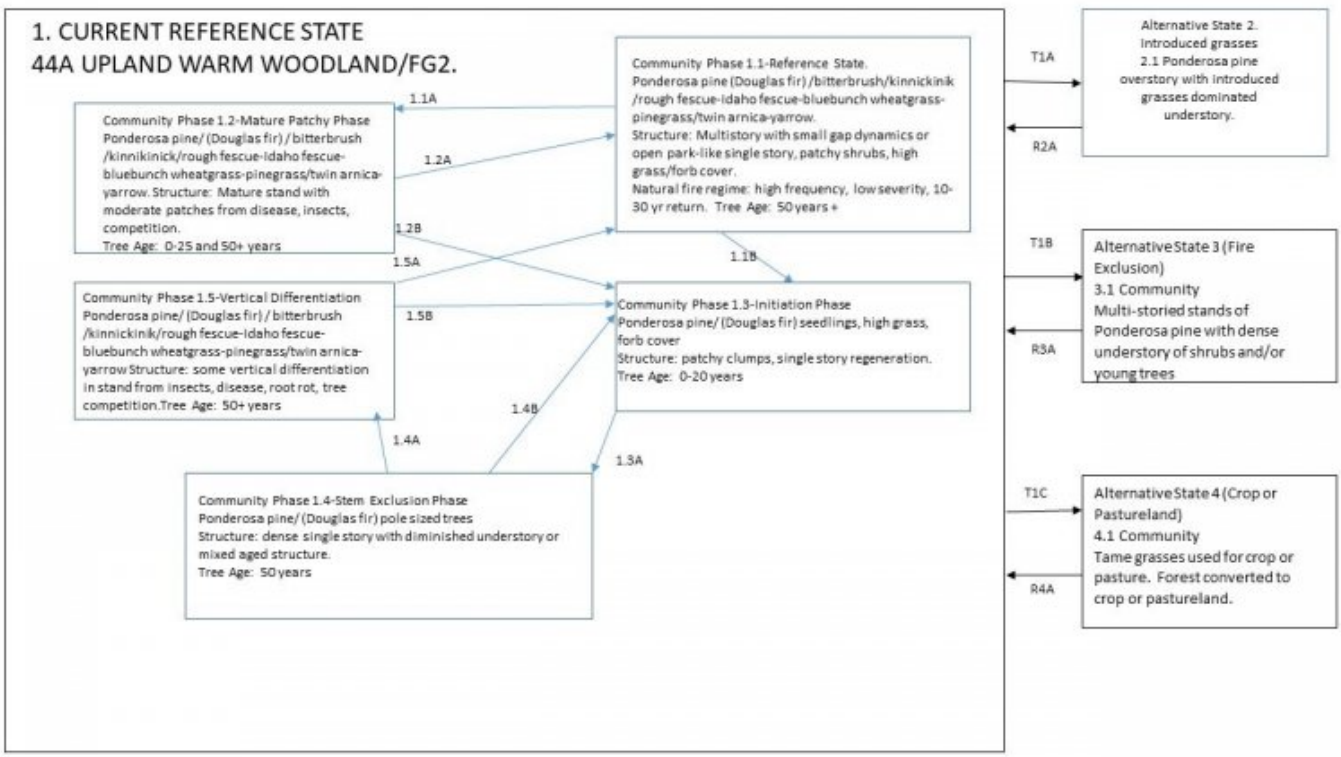
• Soil surface texture gravelly or cobbly or stony coarse sandy loam in surface mineral 4 inches
• Parent material is colluvium or outwash derived from granite and gneiss,
• Drainage class is well to excessively well drained; no flooding frequency

Table 4. Representative soil features

Parent material	(1) Outwash–granite (2) Outwash–gneiss (3) Colluvium–granite (4) Colluvium–gneiss
Surface texture	(1) Gravelly coarse sandy loam (2) Cobbly coarse sandy loam (3) Stony coarse sandy loam
Drainage class	Well drained to excessively drained
Soil depth	20–60 in
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 – Introduced grasses dominate the understory with overstory of Ponderosa pine
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 introduced grass understory to native perennial bunchgrasses
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:
Forage production of palatable grass species is low, though pinegrass can dominate areas. 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.

Bunchgrass and/or bitterbrush dominated areas:
This site has a high cover of bunchgrasses (rough fescue, Idaho fescue, bluebunch wheatgrass) in the understory, therefore the forage production for livestock is moderate, though steep slopes may limit their use.

Elk and mule deer use this site, especially during the winter for sun exposure even though browse is generally low. In areas with high cover of bitterbrush, there may be substantial deer and elk use.

Hydrological functions

Understory of native, perennial deep rooted bunchgrasses and rhizomatous grasses and shrubs, hold water in soil. Therefore, if there is a transition to annual grasses there is a concomitant loss in plant available water.

Recreational uses

HIKING, BIKING, PHOTOGRAPHY

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.

Bunchgrass dominated areas:
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

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

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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	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:**

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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):**

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:**