

Ecological site F044AP902MT Shallow Warm Woodland Group

Last updated: 9/08/2023
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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 TYPES:

PSME/PSSP6

PSME/CARU-ARUV

PIPO/PSSP6

Ecological site concept

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

This is an open canopy woodland of ponderosa pine or Douglas fir with an understory of either native bunchgrasses, namely bluebunch wheatgrass, or an understory of the rhizomatous pinegrass with associated kinnikinnick, a low growing shrub. The understory production ranges from 300 to 800 dry pounds per acre.

- Soils are
 - o Generally not limy (limited extent)
 - o Shallow (less than 50cm deep to bedrock; lithic, or paralithic root restrictive layer)
 - o Not ashy or medial textural family
 - o Typically less than 5% stone and boulder surface cover (<15% max)
- Soil surface texture ranges from gravelly silt loam to stony loam in surface mineral 4"
- Parent material is slope alluvium or colluvium over residuum weathered from granite
- Drainage class is well drained; no flooding frequency
- Site Landform: escarpments, hillslopes, mountains
- Moisture Regime: ustic

- Temperature Regime: frigid
- Elevation Range: 2200-5500 ft
- Slope: 4-35%

Associated sites

F044AP903MT	Upland Cool Woodland Group This associated ecological site resides in slightly moister site conditions than this ecological site.
F044AP905MT	Upland Warm Woodland Group This associated ecological site resides in warmer, drier site conditions than this ecological site.

Similar sites

F044AH003MT	Montane Moderately Warm Dry Coniferous Seeley, Swan, Flathead and Tobacco Valleys This similar ecological site has dry site conditions and an overstory of Douglas fir, but is limited to the north central portion of this MLRA.
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Table 1. Dominant plant species

Tree	(1) <i>Pseudotsuga menziesii</i> var. <i>glauca</i> (2) <i>Pinus ponderosa</i>
Shrub	Not specified
Herbaceous	(1) <i>Pseudoroegneria spicata</i> (2) <i>Calamagrostis rubescens</i>

Physiographic features

Table 2. Representative physiographic features

Landforms	(1) Valley > Hillslope (2) Valley > Escarpment
Elevation	2,200–5,500 ft
Slope	4–35%
Water table depth	60 in
Aspect	W, NW, N, NE, E, SE, S, SW

Climatic features

- Moisture Regime: ustic
- Temperature Regime: frigid
- Representative Value (RV) of range of Mean Annual Precipitation: 16-32 inches
- Representative Value (RV) of range of Mean Average Annual Temperature: 39-46 degrees
- Representative Value (RV) of range of Frost Free Days: 70-90 days

Table 3. Representative climatic features

Frost-free period (characteristic range)	49-103 days
Freeze-free period (characteristic range)	97-137 days
Precipitation total (characteristic range)	12-21 in
Frost-free period (actual range)	15-117 days
Freeze-free period (actual range)	77-145 days
Precipitation total (actual range)	11-23 in
Frost-free period (average)	76 days

Freeze-free period (average)	115 days
Precipitation total (average)	16 in

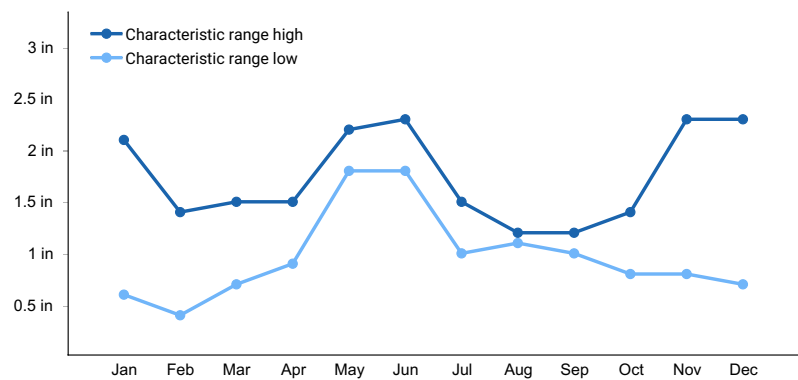


Figure 1. Monthly precipitation range

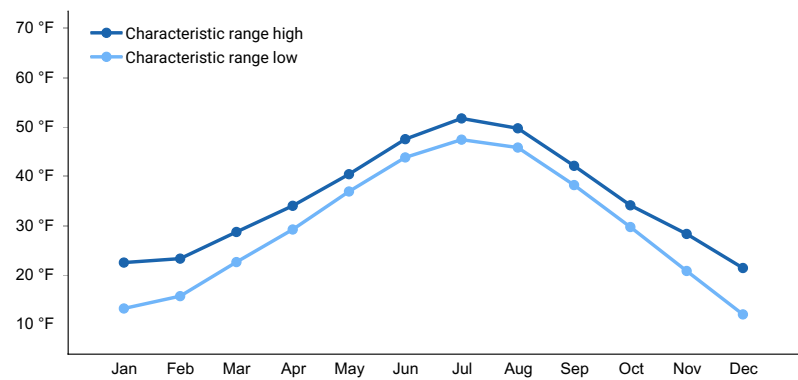


Figure 2. Monthly minimum temperature range

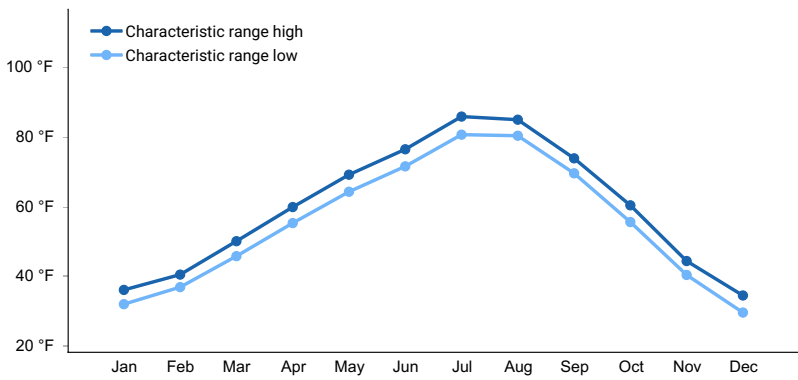


Figure 3. Monthly maximum temperature range

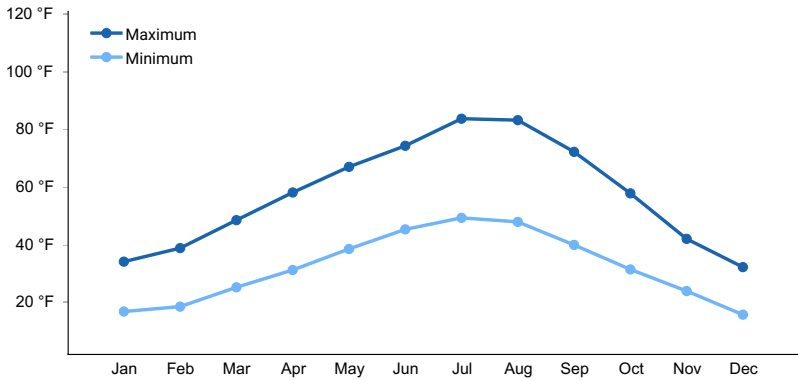


Figure 4. Monthly average minimum and maximum temperature

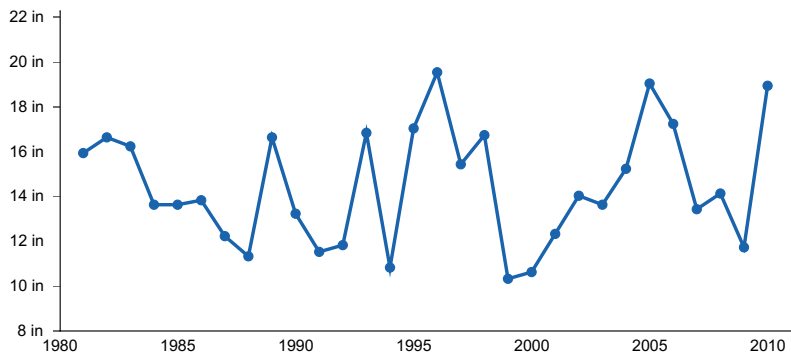


Figure 5. Annual precipitation pattern

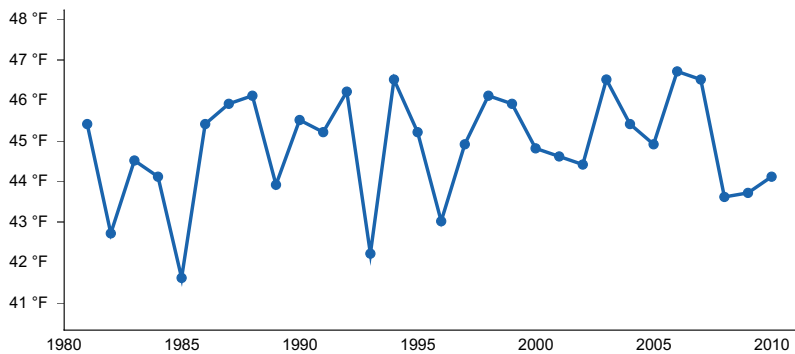


Figure 6. Annual average temperature pattern

Climate stations used

- (1) WHITEFISH [USC00248902], Whitefish, MT
- (2) BONNERS FERRY [USC00101079], Bonners Ferry, ID
- (3) BAYVIEW MODEL BASIN [USC00100667], Athol, ID
- (4) POLSON KERR DAM [USC00246640], Polson, MT
- (5) OVANDO 9 SSE [USC00246304], Helmville, MT
- (6) STEVENSVILLE [USC00247894], Stevensville, MT
- (7) TRIDENT [USC00248363], Three Forks, MT
- (8) TOWNSEND [USC00248324], Townsend, MT
- (9) DRUMMOND AVIATION [USW00024139], Drummond, 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 Shallow (less than 50 cm deep to bedrock; lithic, or paralithic root restrictive layer)
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- Parent material is slope alluvium or colluvium over residuum weathered from granite
- Drainage class is well drained; no flooding frequency

Table 4. Representative soil features

Parent material	(1) Slope alluvium–granite (2) Colluvium–granite (3) Residuum–granite
Surface texture	(1) Gravelly silt loam (2) Stony loam
Drainage class	Well drained
Soil depth	10–19 in
Surface fragment cover >3"	0–15%

Ecological dynamics

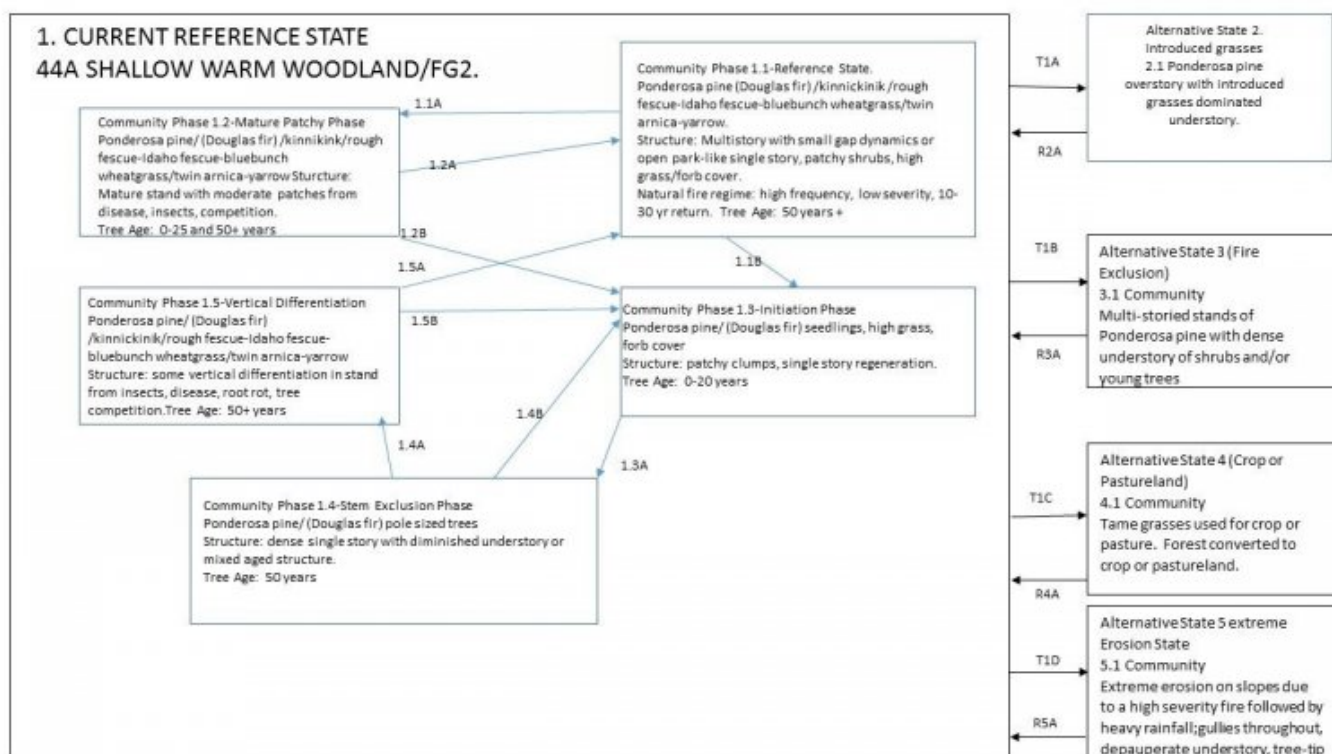
Legend

STATE 1. These sites may be less productive and have more shrubs in the understory than the counterpart Shallow Cool Woodland (F044AP905MT).

STATE 2. These sites may be more prone to weed invasion than the counterpart Shallow Cool Woodland (F044AP905MT).

STATE 3. These site may not be converted to crop/pastureland to the extent as the counterpart Shallow Cool Woodland (F044AP905MT).

State and transition model



Pathways

1.1A – Moderate sized patches of tree mortality due to fire, insect, disease, windthrow.

1.1B – This represents stand replacement disturbance such as severe fire or insect mortality that returns this to the stand initiation phase.

1.2A – Time and infilling of moderate sized patches with trees to a reference stand of multistory stand.

1.2B – This represents stand replacement disturbance such as severe fire or insect mortality that returns this to the stand 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 – This represents stand replacement disturbance such as severe fire or insect mortality that returns this to the stand initiation phase.

1.5A – Time with no major disturbance to transition to the reference phase community

1.5B – This represents stand replacement disturbance such as severe fire or insect mortality that returns this to the stand initiation phase.

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

T1D – Extreme erosion has occurred at site with gullies throughout, depauperate understory and tree tipping due to high severity fire followed by heavy rainfall

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

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.

Hydrological functions

This is a dry forest site in which the native bunchgrass understory serves to hold water longer and deeper in the soil. If there are disruptions via drought or management in which native bunchgrasses are replaced by annual or non-native grass species, there will be less water stored in the soil and available for plant use.

Recreational uses

HIKING, BIKING, PHOTOGRAPHY

Wood products

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

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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Approval

Kirt Walstad, 9/08/2023

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	05/11/2025
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:
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17. **Perennial plant reproductive capability:**
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