

Ecological site F044BP911MT

Upland Warm Woodland

Last updated: 8/26/2019
Accessed: 08/09/2026

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): 044B—Central Rocky Mountain Valleys

44B Central Rocky Mountain Valleys Major Land Resource Area (MLRA) 44B, Central Rocky Mountain Valleys, is nearly 3.7 million acres of Southwest Montana. This MLRA borders 2 MLRAs: 43B Central Rocky Mountains and Foothills, and MLRA 46 Northern and Central Rocky Mountain Foothills. The major watersheds of this MLRA are the Missouri and Yellowstone Rivers along with their associated headwaters such as the Beaverhead, Big Hole, Jefferson, Ruby, Madison, Gallatin, and Shields Rivers. Limited portions of the MLRA are west of the Continental Divide along the Clark Fork River. These waters allow for extensive irrigation for crop production in an area that would generally be only compatible with rangeland and grazing. The Missouri River and its headwaters are contained behind several reservoirs used for irrigation water, hydroelectric power, and municipal water. The primary land use of this MLRA is production agriculture (grazing, small grain production, and hay) with limited mining. Urban Development is also high. MRLA 44B consists of 7 Climate based Land Resource Units (LRUs). Annual precipitation ranges from a low of 9" to a high near 24". The driest areas tend to be in the valley bottoms of southwest Montana in the rain shadow of the mountains. The wettest areas tend to be near the edges of the MLRA where it borders with MLRA 43B. Frost Free periods also vary greatly with from less than 30 days in the Big Hole Valley to approximately 110 days in the warm valleys along the Yellowstone River and Missouri River Headwaters. MLRA 44B's plant communities are highly variable however are dominated by a cool season grass and shrub steppe community on the rangeland and a mixed coniferous forest in the mountains. Warm season grasses occupy an extremely limited extent in this MLRA. Most subspecies of Big Sagebrush are present, to some extent, across the MLRA.

Ecological site concept

• Site does not receive any additional water • Dominant Cover: Ponderosa Pine 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" • Parent material is tertiary valley fill and recent alluvium • An area of dissected mountain valleys. The valleys are typically bordered by mountains trending north to south. • Site Landforms: hillslopes, fan remnants, escarpments • Moisture Regime: ustic • Temperature Regime: frigid • Elevation Range: 3500-5500 • Slope: 0-60% (typically less than 25%)

Table 1. Dominant plant species

Tree	(1) <i>Pinus ponderosa</i> (2) <i>Pinus flexilis</i>
Shrub	(1) <i>Purshia tridentata</i> (2) <i>Artemisia tridentata</i>
Herbaceous	(1) <i>Pseudoroegneria spicata</i> (2) <i>Festuca campestris</i>

Physiographic features

Table 2. Representative physiographic features

Landforms	(1) Valley > Hillslope (2) Valley > Fan remnant (3) Valley > Escarpment
Elevation	1,070 – 1,680 m
Slope	0 – 60 %

Climatic features

Table 3 Representative climatic features

Frost-free period (characteristic range)	50-100 days
Freeze-free period (characteristic range)	100-130 days
Precipitation total (characteristic range)	280-330 mm
Frost-free period (actual range)	30-100 days
Freeze-free period (actual range)	70-130 days
Precipitation total (actual range)	280-360 mm
Frost-free period (average)	70 days
Freeze-free period (average)	110 days
Precipitation total (average)	310 mm

- (1) DILLON AP [USW00024138], Dillon, MT
- (2) DEER LODGE 3 W [USC00242275], Deer Lodge, MT
- (3) HELENA RGNL AP [USW00024144], Helena, MT
- (4) TRIDENT [USC00248363], Three Forks, MT
- (5) WHITE SULPHUR SPRNGS 2 [USC00248930], White Sulphur Springs, MT

Influencing water features

n/a

Wetland description

Soil features

Table 4. Representative soil features

Parent material	(1) Colluvium (2) Slope alluvium
Surface fragment cover >3"	0 – 10 %

Ecological dynamics

The Upland Warm Woodland Ecological Site Grouping is defined by 2 communities in the Reference State (1) that are dominated by Ponderosa pine with limited Limber pine and Rocky Mountain Juniper. Rarely Douglas fir will occur on this site. The Upland Warm Woodland Reference Community (1.1) is considered a grazeable forest due to a relatively low tree density which allows for an understory dominated by herbaceous forage. Bluebunch wheatgrass, limited Rough fescue, and Idaho Fescue are the dominate grass species. Threadleaf sedge and sandberg bluegrass compose a minor component. Shrubs and forbs remain a small proportion of the overall production of this site. Currant and Sumac are most common with rare amounts of Curleaf mountain mahogany and creeping juniper.

Community 1.2 is a Ponderosa pine community with a healthy herbaceous community of primarily grasses. This community is in response to low intensity fire which removes many shrubs and smaller trees. This allows for larger Ponderosas as well as promotes seed dispersal of the Ponderosa. Communities of the Reference state freely transition with little input.

The Reference state can transition to 2 possible States. State 2 Degraded Overstory or State 3 Degraded Understory.

The transition from Reference to the Degraded Overstory State (2) into a single Community (2.1) known as the Doghair Doug Fir Community. Typically occurs as a response suppression of fire which allows any Douglas Fir seedlings to grow into dense stands. These dense stands restrict herbaceous production. The restoration pathway requires grazing management to maintain understory health, forest harvest management to improve the quality of the remaining live trees, and possibly prescribed fire to reduce seedlings and encourage Ponderosa seedling.

Reference State transition to the Degraded Understory State (3) typically occurs as a result of overgrazing and/or intense understory fire. In some cases, replacement of native grasses with cheatgrass and knapweed occurs which affects the fire frequency and grazeability of the site. The canopy overstory is typically unaffected as Ponderosa pine is fire resistant. Restoration via grazing management and pest management (namely weed control) will be necessary. Time necessary for recovery to the Reference depends on the amount of degradation as well as the presence or absence of invasive species.

State and transition model

Additional community tables

Animal community

Typically produces high quality forage for grazing animals and wildlife. Multiple ground nesting birds utilize this site.

Recreational uses

hunting, hiking, wildlife viewing, landscape view/photography

Wood products

This site typically does not produce commercial timber. Limited opportunities for post-and-pole and firewood industries.

Approval

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	
Approved by	
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:
