

## Ecological site R044BP817MT Subirrigated Shrubland

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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.

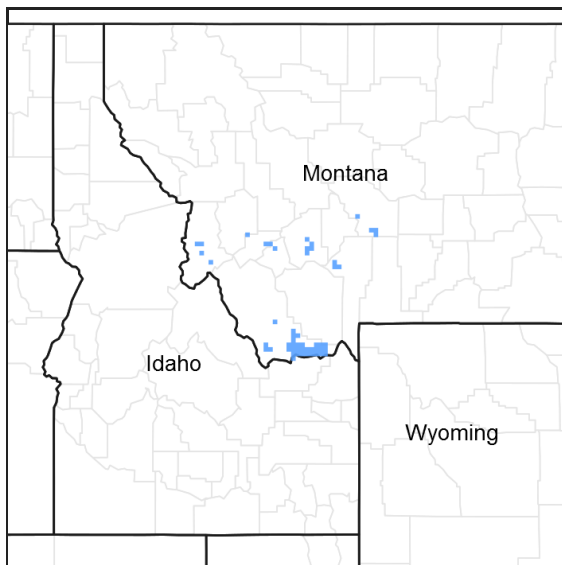


Figure 1. Mapped extent

Areas shown in blue indicate the maximum mapped extent of this ecological site. Other ecological sites likely occur within the highlighted areas. It is also possible for this ecological site to occur outside of highlighted areas if detailed soil survey has not been completed or recently updated.

### 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.

MLRA 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 receives additional water
- This site occurs on low terraces adjacent to flood plains of perennial or intermittent streams (though not in the floodplain), near springs and seeps, or other areas having a permanent or perched water table.
- Moisture Regime: ustic
- Temperature Regime: frigid to cry
- Dominant Cover: Shrubland (defined by lack for sagebrush)
- Elevation Range: 3800-6850 (Representative Value 4500-6000)
- Soils are
  - o Not saline or saline-sodic
  - o Moderately deep, deep, or very deep
  - o Typically less than 5% stone and boulder cover (<10% max)
- Seasonal high water table within 40" (approx. 100cm) of soil surface often closer when *Salix* spp present
- An area of dissected mountain valleys. The valleys are typically bordered by mountains trending north to south.
- Parent material is tertiary valley fill and recent alluvium
- Slope: 0-5%

**Table 1. Dominant plant species**

Tree	Not specified
Shrub	(1) <i>Salix</i> (2) <i>Shepherdia argentea</i>
Herbaceous	(1) <i>Leymus cinereus</i> (2) <i>Elymus lanceolatus</i>

## Physiographic features

**Table 2. Representative physiographic features**

Landforms	(1) Valley > Fan remnant (2) Valley > Stream terrace (3) Valley > Alluvial flat
Elevation	3,800–6,850 ft
Slope	0–5%

## Climatic features

**Table 3. Representative climatic features**

Frost-free period (characteristic range)	24-80 days
Freeze-free period (characteristic range)	60-114 days
Precipitation total (characteristic range)	11-15 in
Frost-free period (actual range)	10-93 days
Freeze-free period (actual range)	26-129 days
Precipitation total (actual range)	11-19 in

Frost-free period (average)	52 days
Freeze-free period (average)	91 days
Precipitation total (average)	14 in

## Climate stations used

- (1) WHITE SULPHUR SPRNGS 2 [USC00248930], White Sulphur Springs, MT
- (2) WISDOM [USC00249067], Wisdom, MT
- (3) HELENA RGNL AP [USW00024144], Helena, MT
- (4) DEER LODGE 3 W [USC00242275], Deer Lodge, MT
- (5) DILLON AP [USW00024138], Dillon, MT
- (6) LIVINGSTON MISSION FLD [USW00024150], Livingston, MT
- (7) BOZEMAN MONTANA ST U [USC00241044], Bozeman, MT
- (8) ENNIS [USC00242793], Ennis, MT
- (9) BOULDER [USC00241008], Boulder, MT
- (10) LAKEVIEW [USC00244820], Lima, MT

## Influencing water features

Site occurs on low terraces adjacent to floodplains of perennial or intermittent streams though not actually located in the floodplain. Site also occurs near springs, seeps, and other areas having permanent or perched water table.

Site has a seasonal high water table within 100cm of soil surface. Water table may be much closer to surface when *Salix* spp are present.

## Soil features

Table 4. Representative soil features

Parent material	(1) Alluvium
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## Ecological dynamics

Community 1.1 of the Reference State is described as an vegetative community with shrubs and grasses co-dominant. Species include buffaloberry, redosier dogwood, willow, Nebraska sedge, thickspike wheatgrass, and Baltic rush.

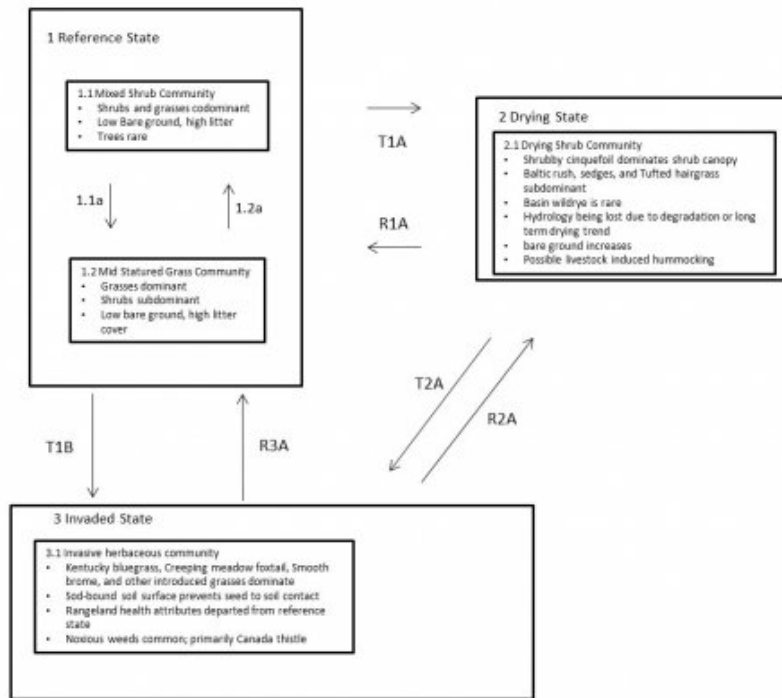
Community 1.2 tends to be a grass dominated system with similar species as 1.1. Shrubs tend to be subdominant

State (2) Drying State consists of drier shrubs such as Shrubby cinquefoil and buffaloberry. Tufted hairgrass, baltic rush, and basin wildrye are present. Hydrology is lost due to degradation or long term drought. Livestock induced hummocking possible

Invaded State (3) tends to be productive however invaded with kentucky bluegrass, creeping meadow foxtail, smooth brome, and other introduced grasses. It is not uncommon for Canada thistle to be growing also.

## State and transition model

## Subirrigated, Shrubland R044BP817MT



## MLRA 44B Subirrigated Shrubland R044BP817MT

### Legend

- 1.1a extended drought, improper grazing, climate change
- 1.2a proper grazing management, favorable growing conditions, time
  
- T1A poor grazing, drought with improper grazing, multiple spring grazing
- T1B sodbusting, introduction of tame pasture species and other invasive plants, overgrazing, drought
- R1A proper grazing management, favorable growing conditions, time, tree/shrub establishment
  
- T2A overgrazing, introduction of weeds, drought, heavy human disturbance, conversion to introduced species
- R2A fire, range seeding, timely moisture, proper grazing management, IPM
  
- R3A IPM, range seeding, timely moisture, grazing management, brush management, range seeding, tree/shrub establishment

## Approval

Scott Woodall, 8/26/2019

## 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:

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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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