

## Ecological site R044BP813MT Subirrigated Saline-Sodic Grassland

Last updated: 8/26/2019  
Accessed: 05/19/2024

### 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.

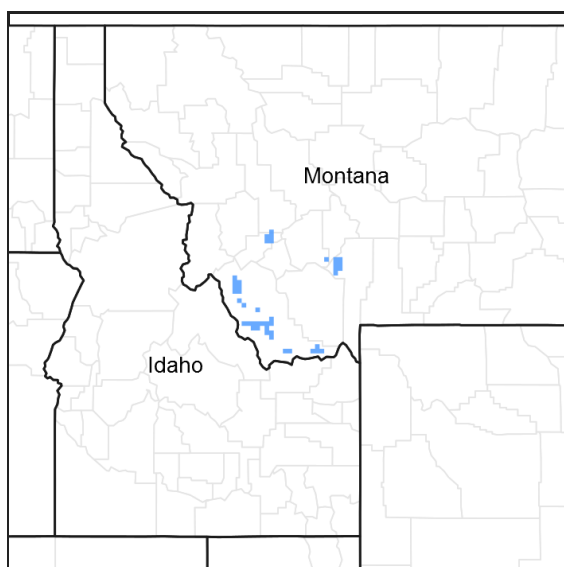


Figure 1. Mapped extent

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
- Elevation Range: 3800-6850 (Representative Value 4500-6000)
- Soils are
  - o Saline or saline-sodic (EC>7 or SAR>12 in surface 18cm)
  - o Moderately deep, deep, or very deep
  - o Typically less than 5% stone and boulder cover (<10% max)
- Seasonal high water table within 150cm of soil surface.
- 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
- Dominant Cover: rangeland (grass dominated)
- Slope: 0-5%

**Table 1. Dominant plant species**

Tree	Not specified
Shrub	(1) <i>Sarcobatus vermiculatus</i> (2) <i>Chrysothamnus viscidiflorus</i>
Herbaceous	(1) <i>Pseudoroegneria spicata</i> (2) <i>Festuca campestris</i>

## Physiographic features

**Table 2. Representative physiographic features**

Landforms	(1) Valley > Fan remnant (2) Valley > Stream terrace (3) Valley > Alluvial flat
Elevation	1,158–2,088 m
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)	279-381 mm
Frost-free period (actual range)	10-93 days
Freeze-free period (actual range)	26-129 days
Precipitation total (actual range)	279-483 mm

Frost-free period (average)	52 days
Freeze-free period (average)	91 days
Precipitation total (average)	356 mm

## 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

seasonal water table within 150 cm of soil surface

## Soil features

**Table 4. Representative soil features**

Parent material	(1) Alluvium
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## Ecological dynamics

1.1 Basin wildrye, western wheatgrass, and alkali sacaton dominant plants. Inland saltgrass present as subordinate plant. Scarlet globemallow, hoods phlox, and Chenopods common forbs. Saltbush and winterfat present. Bare ground is typically naturally low.

1.1a extended drought, improper grazing, climate change

1.2 Western wheatgrass and Alakali sacaton remain dominant, Mid-statured decreaser bunchgrasses will be rare. Saltgrass and other shortgrasses and grasslikes increasing. Shrubs remain low. Bare ground may increase

1.2a proper grazing management, favorable growing conditions, time

2.1 Hardstem bulrush, Baltic rush, Tufted hairgrass dominant grasses and grasslikes . Forbs remain a small component of community. Saltbush takes on a prostrate growing form. Large gaps between plant bases. Possible salt crusting on soil surface. Waterflow patterns and pedestalling frequent.

T1A poor grazing, drought with improper grazing, multiple spring grazing events,

R1A proper grazing management, favorable growing conditions, time, tree/shrub establishment

3.1 Subshrubs and shortgrasses share dominance in native degraded site often containing foxtail barely, alkali bluegrass, and hardstem bullrush. Site invaded by pasture grasses will often contain Creeping meadow foxtail and green foxtail. Forbs particularly Chenopods (namely sumpweed) common, Cheatgrass invades if site is dry. Bare ground high, salt crusting common.

T1B introduction of invasive plants, multiple/frequent overgrazing events, drought

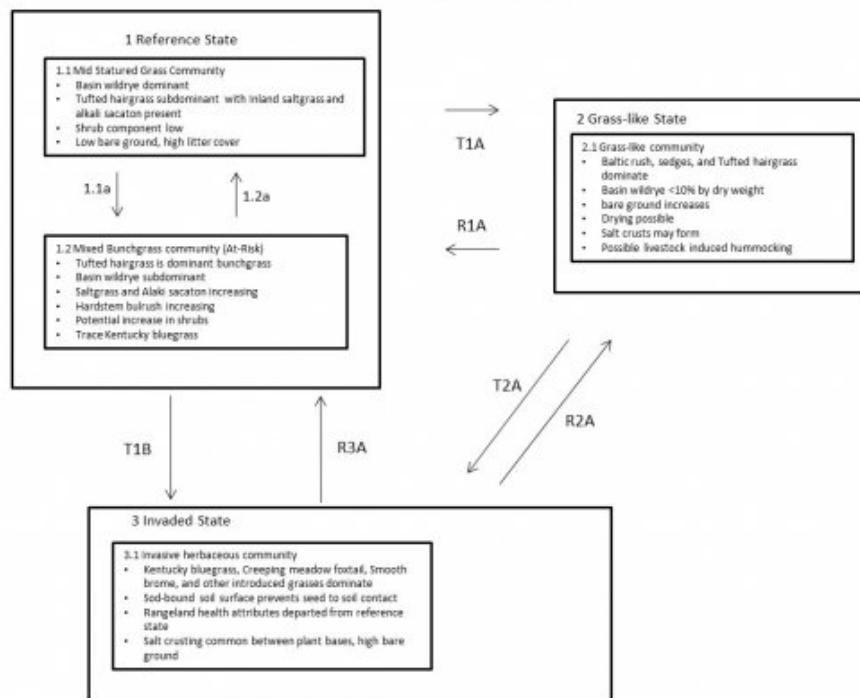
T2A overgrazing, introduction of weeds, drought, heavy human disturbance, conversion to introduced species

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

## State and transition model

## Subirrigated Saline-Sodic Grassland R044BP813MT



## MLRA 44B Subirrigate Saline/Sodic Grassland R044BP813MT

### Legend

- **1.1** Basin wildrye, western wheatgrass, and alkali sacaton dominant plants. Inland saltgrass present as subordinate plant. Scarlet globemallow, hood's phlox, and Chenopods common forbs. Saltbush and winterfat present. Bare ground is typically naturally low.
- **1.1a** extended drought, improper grazing, climate change
- **1.2** Western wheatgrass and Alkaline sacaton remain dominant, Mid-statured decreaser bunchgrasses will be rare. Saltgrass and other shortgrasses and grasslikes increasing. Shrubs remain low. Bare ground may increase
- **1.2a** proper grazing management, favorable growing conditions, time
- **2.1** Hardstem bulrush, Baltic rush, Tufted hairgrass dominant grasses and grasslikes. Forbs remain a small component of community. Saltbush takes on a prostrate growing form. Large gaps between plant bases. Possible salt crusting on soil surface. Waterflow patterns and pedestalling frequent.
- **T1A** poor grazing, drought with improper grazing, multiple spring grazing events,
- **R1A** proper grazing management, favorable growing conditions, time, tree/shrub establishment
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- **T1B** introduction of invasive plants, multiple/frequent overgrazing events, drought
- **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:**

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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):**
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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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