

Ecological site R044BP801MT Bottomland

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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.

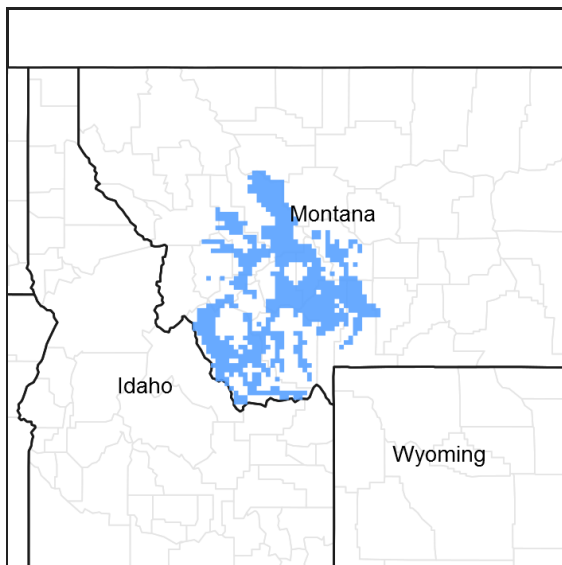


Figure 1. Mapped extent

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

- This site occurs in flood plains of perennial and intermittent streams, near springs and seeps, or other areas having a permanent or perched water table with riparian area
- Dominant Cover: mixed vegetation
- Moisture Regime: ustic
- Temperature Regime: frigid to cryic
- Elevation Range: 3800-6850 (Representative Value 4500-6000)
- Site receives additional water
- 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.
- An area of dissected mountain valleys. The valleys are typically bordered by mountains trending north to south.
- Parent material is recent alluvium
- Slope: 0-5%

Table 1. Dominant plant species

Tree	(1) <i>Salix</i> (2) <i>Populus</i>
Shrub	(1) <i>Salix</i>
Herbaceous	(1) <i>Leymus cinereus</i>

Physiographic features

Table 2. Representative physiographic features

Landforms	(1) Valley > Flood plain (2) Valley > Stream terrace
Elevation	1,158–1,829 m
Slope	0–5%

Climatic features

Table 3. Representative climatic features

Frost-free period (characteristic range)	25-88 days
Freeze-free period (characteristic range)	67-128 days
Precipitation total (characteristic range)	279-406 mm
Frost-free period (actual range)	23-104 days
Freeze-free period (actual range)	49-142 days
Precipitation total (actual range)	279-432 mm
Frost-free period (average)	60 days

Freeze-free period (average)	97 days
Precipitation total (average)	330 mm

Climate stations used

- (1) CANYON FERRY DAM [USC00241470], Helena, MT
- (2) DILLION U OF MONTANA WESTERN [USC00242409], Dillon, MT
- (3) HOLTER DAM [USC00244241], Wolf Creek, MT
- (4) LIMA [USC00245030], Lima, MT
- (5) LAKEVIEW [USC00244820], Lima, MT
- (6) VIRGINIA CITY [USC00248597], Virginia City, MT
- (7) LIVINGSTON 12 S [USC00245080], Livingston, MT
- (8) DEER LODGE 3 W [USC00242275], Deer Lodge, MT

Influencing water features

Site is in an active floodplain, along permanent streams and low wet areas associated with riparian systems

Soil features

Soils may or may not express hydric characteristics of reduction and oxidation however water table is within 100cm of surface and often at or near the surface.

Table 4. Representative soil features

Parent material	(1) Alluvium
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Ecological dynamics

1 Reference State (as represented by active floodplain). Due to active stream dynamics, no one community can describe the reference state and it is common for multiple communities to exist in a relatively small area.

1.1 This plant community is primarily composed of colonizing grasses and sedge and is relatively unstable due to shallow rooted plants and frequent flooding. Willows may exist on site but are typically in small clumps or as single plants

1.1a Site becomes more stable over time, deeper rooted plants increase

1.1b Site experiences flooding that exceeds rooting strength of plant community, heavy grazing reduces shrub component

1.2 This plant community contains a high diversity of willows, dogwood, sedges (beaked, Nebraska, and water), and grasses (tufted hairgrass, American and fowl mannagrass, reedgrass). There are several other grasses and grasslikes (bearded wheatgrass, meadow barley, American sloughgrass, and Baltic rush), along with a variety of forbs. Slight variations in climate and elevation may cause some minor shifting of the willow species. This site is moderately stable and typically can withstand occasional flooding

1.2a Site becomes more stable over time, stream dynamics change (possibly man made structure) causing floodplain to shift to a drier site

1.2b Site experiences catastrophic flooding often associated with extreme weather event and/or ice jam

1.3 Mid-statured trees become more prevalent with interspersed coniferous trees possible. Site is very stable but drying due to natural stream dynamics. Willows remain the primary shrub however buffaloberry, chokecherry, and buffaloberry are increasing. Grasses and sedges remain as the understory.

1.3b Site experiences catastrophic flooding often associated with extreme weather event and/or ice jam

2.1 Mature Tree Dominated state where large cottonwood, spruce, chokecherry, aspen, and birch trees comprise overstory. Grasses often control the understory with dry shrubs. Site is very stable, drying, and has lost nearly all of its stream dynamic (often associated with a down cutting of the stream or loss of stream meandering)

T1a Long term stability created by nearly complete lack of wild flooding (either natural or man created), Improper grazing promotes grass growth.

R2 Site experiences catastrophic flooding often associated with extreme weather events and/or ice jams; Brush management, grazing management will also be necessary

3.1 Wetland characteristics of site altered. Baltic rush and increaser species become prevalent. Site drying due to stream downcutting. Hummocking by livestock possible

T1b Improper grazing (overgrazing or repeated spring grazing), extended drought.

R3 Improved grazing practices (change of season of use, conservative stocking rates), tree/shrub establishment, water impoundments (beaver dams, log jams, or dam analogs)

4.1 Dry riparian site: Site is typically dominated by native grasses such as basin wildrye, thickspike wheatgrass, and slender wheatgrass. Shrubby cinquefoil, buffaloberry, Big sagebrush, and silver sagebrush are dominant shrubs. Site loses hydrology due to downcutting of stream or stream meandering.

T1c Natural stream dynamics creates a dry site that was once wetter. Improper grazing creates accelerated stream downcutting

T3a Drying of system as a result of loss of hydrology and increase in drier shrub species encroaching.

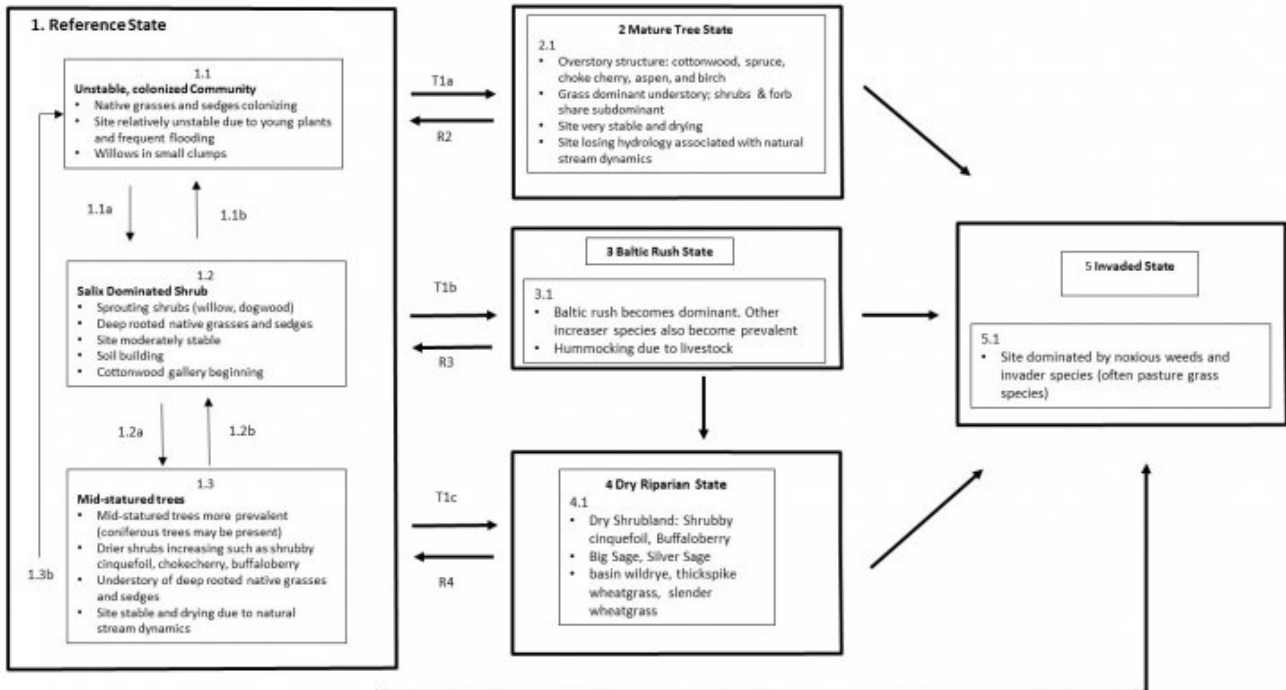
R4 Grazing management (timing and amount to improve shrub and tree establishment), brush management to remove unwanted drier species

5.1 Invaded State: This includes many non-native species that have come to dominate riparian areas. Some species may include: orchard grass, timothy, Kentucky bluegrass, non-native thistles, Russian olive, leafy spurge, spotted knapweed, houndstounge, foxtail barley, whitetop mustard. Often sites are a combination both pasture grasses and invading weeds. Site is often a terminal state; meaning these sites are likely to never return to Reference regardless of management

T1d, T2a, T3b, T4a Sites are invaded by noxious weeds or introduced pasture grasses. Pasture grasses may be planted or a result of invasion from neighboring sites. Improper grazing may be a trigger for invasion however flooding may transport seeds to freshly deposited alluvium.

State and transition model

Bottomland, R044BP801MT



- 1 Reference State** (as represented by active floodplain). Due to active stream dynamics, no one community can describe the reference state and it is common for multiple communities to exist in a relatively small area.
- 1.1 This plant community is primarily composed of colonizing grasses and sedge and is relatively unstable due to shallow rooted plants and frequent flooding. Willows may exist on site but are typically in small clumps or as single plants
- 1.1a Site becomes more stable over time, deeper rooted plants increase
- 1.1b Site experiences flooding that exceeds rooting strength of plant community, heavy grazing reduces shrub component
- 1.2 This plant community contains a high diversity of willows, dogwood, sedges (beaked, Nebraska, and water), and grasses (tufted hairgrass, American and fowl mannagrass, reedgrass). There are several other grasses and grasslikes (bearded wheatgrass, meadow barley, American sloughgrass, and Baltic rush), along with a variety of forbs. Slight variations in climate and elevation may cause some minor shifting of the willow species. This site is moderately stable and typically can withstand occasional flooding
- 1.2a Site becomes more stable over time, stream dynamics change (possibly man made structure) causing floodplain to shift to a drier site
- 1.2b Site experiences catastrophic flooding often associated with extreme weather event and/or ice jam
- 1.3 Mid-statured trees become more prevalent with interspersed coniferous trees possible. Site is very stable but drying due to natural stream dynamics. Willows remain the primary shrub however buffaloberry, chokecherry, and buffaloberry are increasing. Grasses and sedges remain as the understory.
- 1.3b Site experiences catastrophic flooding often associated with extreme weather event and/or ice jam
- 2.1 Mature Tree Dominated state where large cottonwood, spruce, chokecherry, aspen, and birch trees comprise overstory. Grasses often control the understory with dry shrubs. Site is very stable, drying, and has lost nearly all of its stream dynamic (often associated with a down cutting of the stream or loss of stream meandering)
- T1a Long term stability created by nearly complete lack of wild flooding (either natural or man created), Improper grazing promotes grass growth.
- R2 Site experiences catastrophic flooding often associated with extreme weather events and/or ice jams; Brush management, grazing management will also be necessary
- 3.1 Wetland characteristics of site altered. Baltic rush and increaser species become prevalent. Site drying due to stream downcutting. Hummocking by livestock possible
- T1b Improper grazing (overgrazing or repeated spring grazing), extended drought.
- R3 Improved grazing practices (change of season of use, conservative stocking rates), tree/shrub establishment, water impoundments (beaver dams, log jams, or dam analogs)
- 4.1 Dry riparian site: Site is typically dominated by native grasses such as basin wildrye, thickspike wheatgrass, and slender wheatgrass. Shrubby cinquefoil, buffaloberry, Big sagebrush, and silver sagebrush are dominant shrubs. Site loses hydrology due to downcutting of stream or stream meandering.
- T1c Natural stream dynamics creates a dry site that was once wetter. Improper grazing creates accelerated stream downcutting
- T3a Drying of system as a result of loss of hydrology and increase in drier shrub species encroaching.
- R4 Grazing management (timing and amount to improve shrub and tree establishment), brush management to remove unwanted drier species
- 5.1 Invaded State: This includes many non-native species that have come to dominate riparian areas. Some species may include: orchard grass, timothy, Kentucky bluegrass, non-native thistles, Russian olive, leafy spurge, spotted knapweed, houndstounge, foxtail barley, whitetop mustard. Often sites are a combination both pasture grasses and invading weeds. Site is often a terminal state; meaning these sites are likely to never return to Reference regardless of management
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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:
-
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:**
-