USDA Natural Resources Conservation Service

Ecological site R044AP805MT
Shallow Grassland Group

Last updated: 9/07/2023
Accessed: 10/20/2024

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.

MLRA notes

Major Land Resource Area (MLRA): 044A–Northern Rocky Mountain Valleys

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.

Ecological site concept

• Site does not receive any additional water
• Site not located in a flood plain
• Dominant Cover: Grassland; Mid-statured bunchgrasses with bluebunch wheatgrass and Idaho fescue dominant (bluebunch, rough fescue, Idaho fescue, trace cover of prairie Junegrass, Sandberg’s bluegrass), forbs include Indian blanketflower, boreal bedstraw, prairie smoke, twin arnica, rosy pussytoes, silver lupine, Hood's phlox, stoneseed, western sagewort. Shrubs are a relatively small component. Average production is 850 pounds per acre dry weight.

• Soils are
o Not saline or sodic
o Not limy (Soil is not strongly or violently effervescent ($CaCO_3$ > 14%) in surface mineral 18 cm)
o Soil shallow (less than 50cm deep to bedrock, lithic, or paralithic root restrictive layer)
o Not ashy or medial textural family
o Typically less than 15% stone and boulder surface area (<15% max)
• Soil surface texture very stony loam or cobbly loam in surface mineral 4”
• Parent material is slope alluvium or colluvium over residuum weathered from igneous and metasedimentary rock
• Drainage class is well drained; no flooding frequency
• Site Landform: hillslopes, fan remnants, escarpments
• Moisture Regime: ustic
• Temperature Regime: frigid
• Elevation Range: 3500-5500 ft
• Slope: 15-35%

Associated sites

R044AP808MT	**Upland Grassland Group** This associated ecological site resides in areas with deeper soils than this ecological site.

Similar sites

R044AP808MT	**Upland Grassland Group** This ecological site is similar in that it resides in upland areas and has a grassland vegetation community, but this site has deeper soils than the shallow grassland ecological site.

Table 1. Dominant plant species

Tree	Not specified
Shrub	Not specified
Herbaceous	(1) *Pseudoroegneria spicata* (2) *Festuca idahoensis*

Physiographic features

Table 2. Representative physiographic features

Landforms	(1) Valley > Hillslope (2) Valley > Fan remnant (3) Valley > Escarpment
Elevation	1,067–1,676 m
Slope	15–35%
Water table depth	152 cm
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: 16-22 inches
- Representative Value (RV) of range of Mean Average Annual Temperature: 39-45 degrees
- Representative Value (RV) of range of Frost Free Days: 70-100 days

Table 3. Representative climatic features

Frost-free period (characteristic range)	44-101 days
Freeze-free period (characteristic range)	93-138 days
Precipitation total (characteristic range)	330-559 mm
Frost-free period (actual range)	21-115 days
Freeze-free period (actual range)	83-143 days
Precipitation total (actual range)	279-737 mm
Frost-free period (average)	76 days
Freeze-free period (average)	118 days
Precipitation total (average)	457 mm

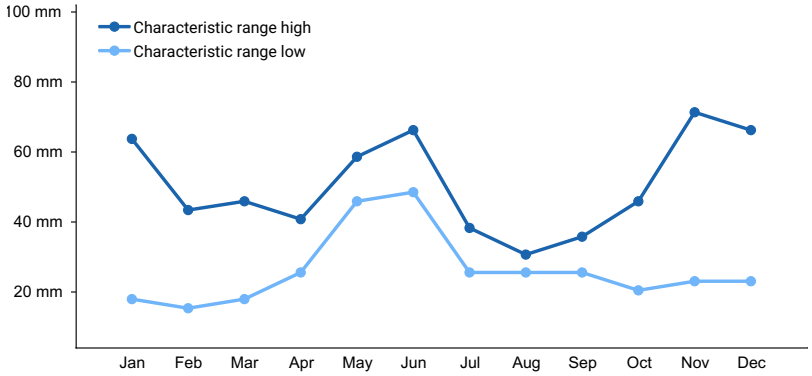


Figure 1. Monthly precipitation range

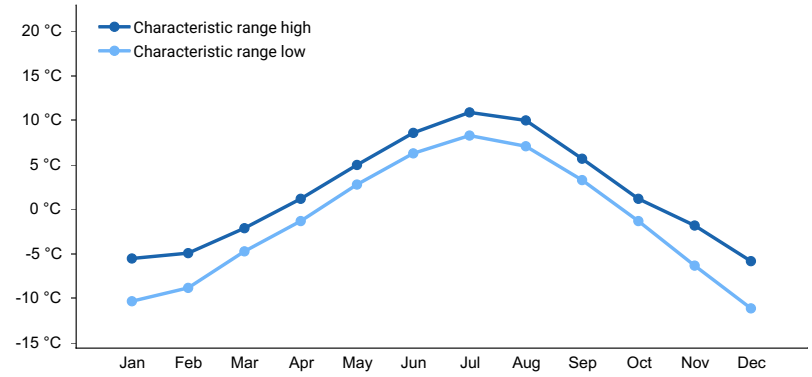


Figure 2. Monthly minimum temperature range

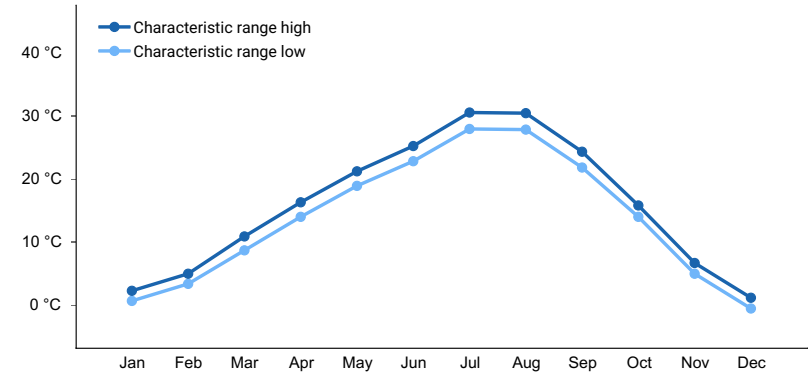


Figure 3. Monthly maximum temperature range

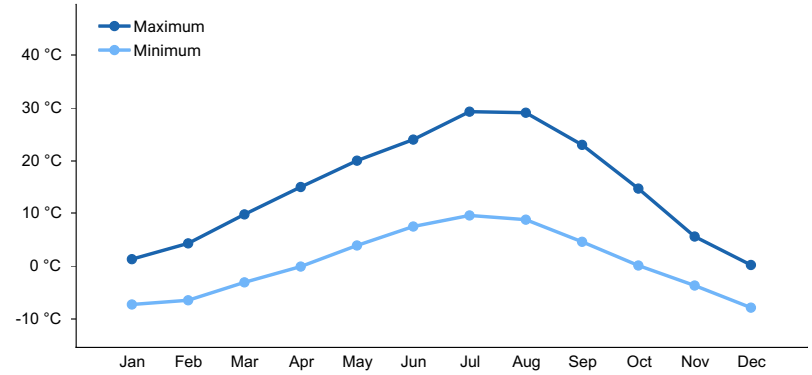


Figure 4. Monthly average minimum and maximum temperature

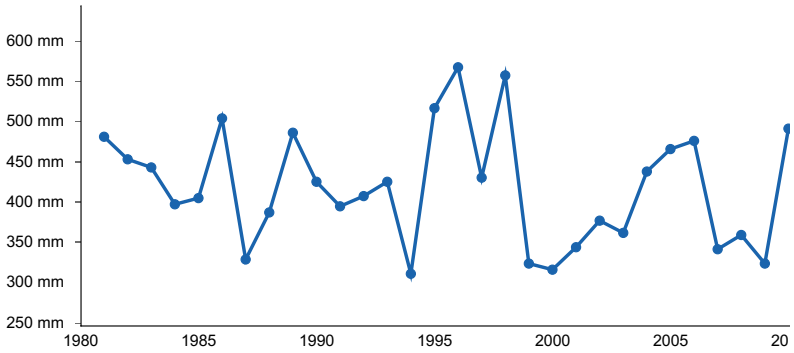


Figure 5. Annual precipitation pattern

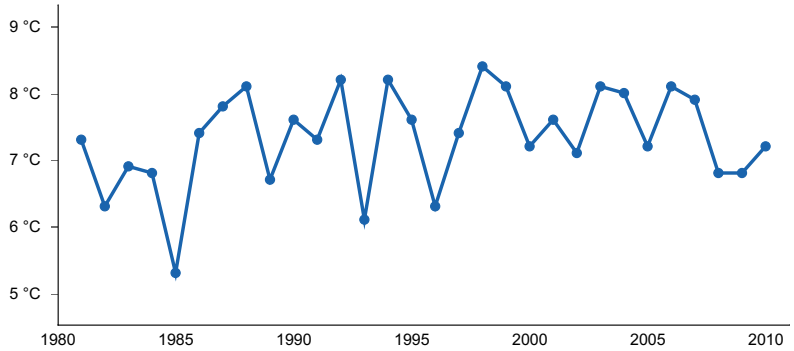


Figure 6. Annual average temperature pattern

Climate stations used

- (1) BONNERS FERRY [USC00101079], Bonners Ferry, ID
- (2) SANDPOINT EXP STN [USC00108137], Sandpoint, ID
- (3) TROUT CREEK RS [USC00248380], Trout Creek, MT
- (4) LIBBY 1 NE RS [USC00245015], Libby, MT
- (5) TROY [USC00248390], Troy, MT
- (6) EUREKA RS [USC00242827], Eureka, MT
- (7) OLNEY [USC00246218], Whitefish, MT
- (8) KALISPELL 9 NNE [USC00244560], Kalispell, MT
- (9) POLSON [USC00246635], Polson, MT
- (10) THOMPSON FALLS PH [USC00248211], Thompson Falls, MT
- (11) SAINT IGNATIUS [USC00247286], Saint Ignatius, MT
- (12) SUPERIOR [USW00024159], Superior, MT
- (13) MISSOULA INTL AP [USW00024153], Missoula, MT
- (14) STEVENSVILLE [USC00247894], Stevensville, MT
- (15) DRUMMOND AVIATION [USW00024139], Drummond, MT
- (16) DEER LODGE 3 W [USC00242275], Deer Lodge, MT
- (17) TWIN BRIDGES [USC00248430], Sheridan, MT
- (18) TRIDENT [USC00248363], Three Forks, MT

Influencing water features

NO WATER FEATURES
• Site does not receive any additional water
• Site not located in a flood plain

Wetland description

DOES NOT APPLY

Soil features

o Not saline or sodic
o Not limy (Soil is not strongly or violently effervescent ($CaCO_3$ greater than 14 percent) in surface mineral 18 cm)
o Soil shallow (less than 50 cm deep to bedrock, lithic, or paralithic root restrictive layer)
o Not ashy or medial textural family
o Typically less than 15 percent stone and boulder surface area (less than 15 percent max)
• Soil surface texture very stony loam or cobbly loam in surface mineral 4 inches.
• Parent material is slope alluvium or colluvium over residuum weathered from igneous and metasedimentary rock
• Drainage class is well drained; no flooding frequency

Table 4. Representative soil features

Parent material	(1) Slope alluvium–igneous and metamorphic rock (2) Colluvium–igneous and metamorphic rock (3) Residuum–igneous and metamorphic rock
Surface texture	(1) Very stony loam (2) Cobbly loam
Drainage class	Well drained
Soil depth	0–48 cm
Surface fragment cover >3"	0–15%

Ecological dynamics

1.1 Mid-statured bunchgrasses dominant (bluebunch, rough fescue, Idaho fescue, trace cover of prairie Junegrass, Sandberg's bluegrass), Shrubs are a relatively small component.
1.1a Extended drought, improper grazing, climate change, catastrophic fire (limited on this site)
1.2 Mid-statured bunchgrasses subdominant to increaser bunchgrasses such as needle-and-thread or Idaho fescue. Shrubs increasing, clubmoss possible (limited extent), mat forming forbs increasing
1.2a Proper grazing management, favorable growing conditions, time

T1A Poor post settlement grazing (late 1800's), drought with improper grazing, multiple spring grazing, fire suppression
T1B Sodbusting, introduction of tame pasture species and other invasive plants, overgrazing, drought, heavy human disturbance, extreme fire (multiple years or very intense)
T1C Poor post settlement grazing (late 1800's), drought with improper grazing, multiple spring grazing and/or long term overgrazing, fire suppression
T3A Sodbusting, invasive plants, overgrazing, extended drought, adjacent to construction or disturbance event

2.1 Mixed grass dominated site (needle-and-thread and Idaho fescue), mid-statured bunchgrasses existent under shrub canopy, possible conifer encroachment, forbs (scarlet globemallow, hoods phlox, mat forming forbs) and shrubs increase (broom snakeweed, big sagebrush)
2.1a Improper grazing management, drought, fire, climate change
2.2 Needle and thread and Idaho fescue losing dominance to Sandberg bluegrass and prairie Junegrass. Decreaser bunchgrasses very rare and limited under shrub canopy. Broom snakeweed and Fringed sagewort beginning to replace shrub component
2.2a Proper grazing management, time, Integrated Pest Management, brush management

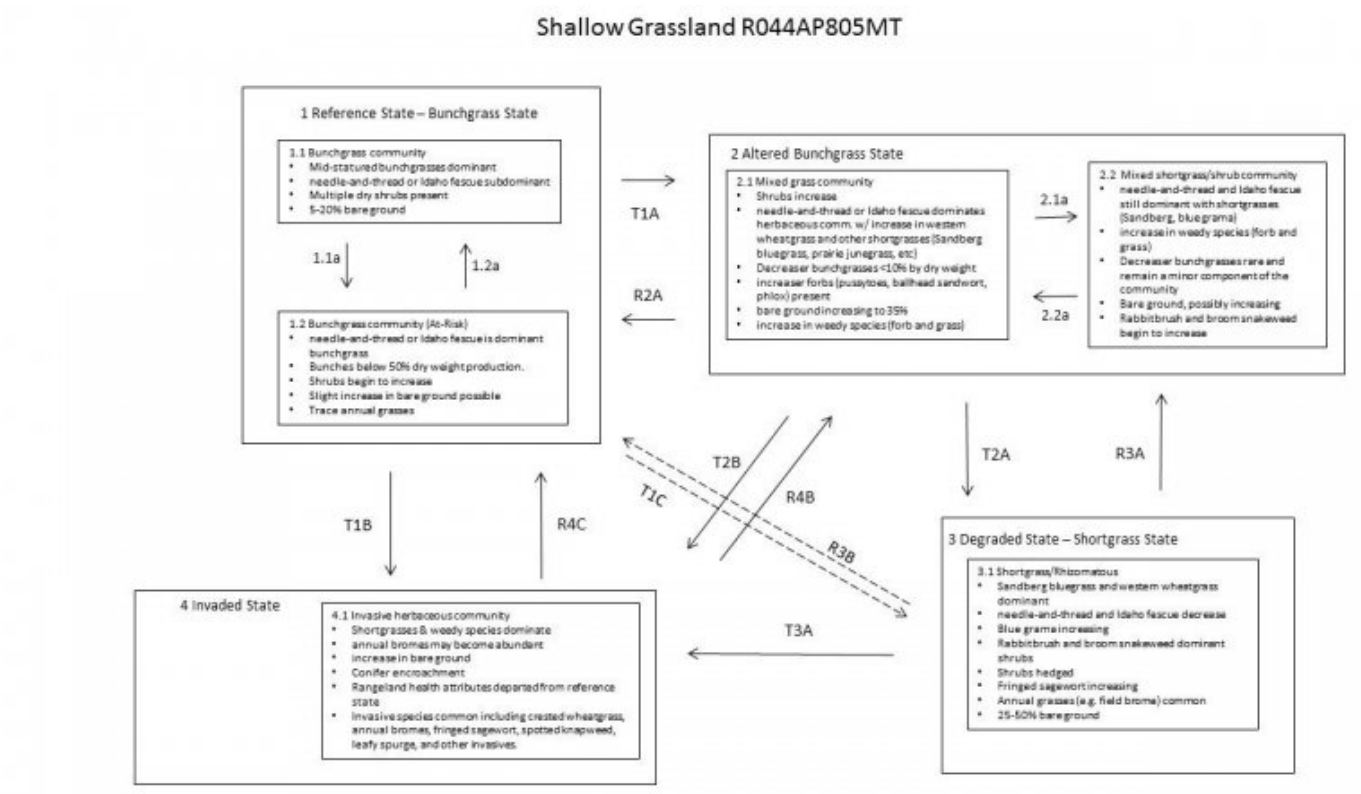
3.1 Shortgrass State lacks mid-statured bunchgrasses, Sandberg bluegrass and Junegrass dominant grasses, increaser shrubs nearly replace larger shrub species. Remaining larger shrub species heavily hedged.

T2A Overgrazing, introduction of weeds, drought, heavy human disturbance
R2A Fire, range seeding, timely moisture, proper grazing management, IPM
R3B Possibly not feasible, range seeding, time, proper grazing management, IPM
T2B Sodbusting, introduction of tame pasture species and other invasive plants, overgrazing, extended drought, adjacent to construction or disturbance event, extreme fire (multiple years or very intense)

4.1 Invaded State may resemble reference however contains noxious or invasive weeds such as cheatgrass or knapweed. Conifer encroachment common.

R3A Range seeding, time, proper grazing management, IPM
R4A IPM, timely moisture, grazing management, brush management, range seeding
R4B IPM, range seeding, timely moisture, grazing management, brush management, range seeding

State and transition model



Legend

Pathways
1.1a Extended drought, improper grazing, climate change, catastrophic fire (limited on this site)
1.2a Proper grazing management, favorable growing conditions, time
2.1a Improper grazing management, drought, fire, climate change
2.2a Proper grazing management, time, Integrated Pest Management, brush management

Transitions
T1A Poor post settlement grazing (late 1800's), drought with improper grazing, multiple spring grazing, fire suppression
T1B Sod busting, introduction of tame pasture species and other invasive plants, overgrazing, drought, heavy human disturbance, extreme fire (multiple years or very intense)
T1C Poor post settlement grazing (late 1800's), drought with improper grazing, multiple spring grazing and/or long-term overgrazing, fire suppression
T3A Sod busting, invasive plants, overgrazing, extended drought, adjacent to construction or disturbance event
T2A Overgrazing, introduction of weeds, drought, heavy human disturbance
R2A Fire, range seeding, timely moisture, proper grazing management, IPM
R3B Possibly not feasible, range seeding, time, proper grazing management, IPM
T2B Sod busting, introduction of tame pasture species and other invasive plants, overgrazing, extended drought, adjacent to construction or disturbance event, extreme fire (multiple years or very intense)
R3A Range seeding, time, proper grazing management, IPM
R4A IPM, timely moisture, grazing management, brush management, range seeding
R4B IPM, range seeding, timely moisture, grazing management, brush management, range seeding

Animal community

WILDLIFE AND LIVESTOCK GRAZING

Recreational uses

HIKING, BIKING, PHOTOGRAPHY

Wood products

NONE

Contributors

Jay Skovlin
Stephanie Shoemaker

Approval

Kirt Walstad, 9/07/2023

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	10/20/2024
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:**

17. **Perennial plant reproductive capability:**