

Ecological site R044AP804MT Saline-Sodic Shrubland Group

Last updated: 9/07/2023
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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.

MLRA notes

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

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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.

Description of MLRAs can be found in: United States Department of Agriculture, Natural Resources Conservation Service. 2006. Land Resource Regions and Major Land Resource Areas of the United States, the Caribbean, and the Pacific Basin. U.S. Department of Agriculture Handbook 296.

Available electronically at: http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/ref/?cid=nrcs142p2_053624#handbook

Ecological site concept

- Site does not receive any additional water
- Site not located in a flood plain
- Dominant Cover: Shrubland; Western wheatgrass, thickspike wheatgrass, needle and thread, Basin wildrye dominant plants. Inland saltgrass and blue grama present as subordinate plants. Forbs are very low cover. Black greasewood dominant with Big sagebrush, Gardner's saltbrush, yellow rabbitbrush less dominant shrubs. Saltbush and winterfat present. Bare ground is typically naturally high. Average production is 1000 dry pounds per acre.
- Soils are
 - o Soil saline or sodic (EC > 7 or SAR > 12 within surface 18cm)
 - o Not limy (Soil is not strongly or violently effervescent (CaCO₃ > 14%) in surface mineral 18cm) – can have calcium carbonates in the subsurface.
 - o Moderately deep, deep or very deep
 - o Not ashy or medial textural family
 - o Typically less than 15% stone and boulder surface area (<15% max)
- Soil surface texture silty clay loam, silt loam in surface mineral 4"
- Parent material is alluvium, lacustrine deposits
- Drainage class is well drained; no flooding frequency
- Site Landform: lake plains, stream terraces, alluvial fans
- Moisture Regime: xeric
- Temperature Regime: frigid
- Elevation Range: 2500-3000 ft
- Slope: 2-15%

Associated sites

R044AP803MT	Saline-Sodic Grassland Group This associated ecological site resides in areas with slightly drier or rockier soils than the ecological site.
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Similar sites

R044AP803MT	Saline-Sodic Grassland Group This ecological site is similar in its saline and/or sodic soil conditions to this ecological site.
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Table 1. Dominant plant species

Tree	Not specified
Shrub	(1) <i>Sarcobatus vermiculatus</i> (2) <i>Atriplex gardneri</i>
Herbaceous	(1) <i>Leymus cinereus</i> (2) <i>Distichlis spicata</i>

Physiographic features

Table 2. Representative physiographic features

Landforms	(1) Valley > Lake plain (2) Valley > Stream terrace (3) Valley > Alluvial fan
Elevation	2,500–3,000 ft
Slope	2–15%
Water table depth	60 in
Aspect	W, NW, N, NE, E, SE, S, SW

Climatic features

- Moisture Regime: xeric
- Temperature Regime: frigid
- Representative Value (RV) of range of Mean Annual Precipitation: 10-14 inches
- Representative Value (RV) of range of Mean Average Annual Temperature: 39-45 degrees
- Representative Value (RV) of range of Frost Free Days: 105-120 days

Table 3. Representative climatic features

Frost-free period (characteristic range)	69-99 days
Freeze-free period (characteristic range)	114-135 days
Precipitation total (characteristic range)	13-25 in
Frost-free period (actual range)	28-115 days
Freeze-free period (actual range)	82-142 days
Precipitation total (actual range)	12-34 in
Frost-free period (average)	82 days
Freeze-free period (average)	122 days
Precipitation total (average)	19 in

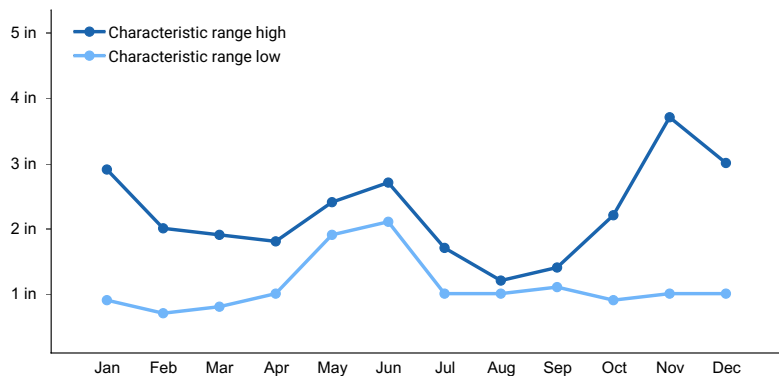


Figure 1. Monthly precipitation range

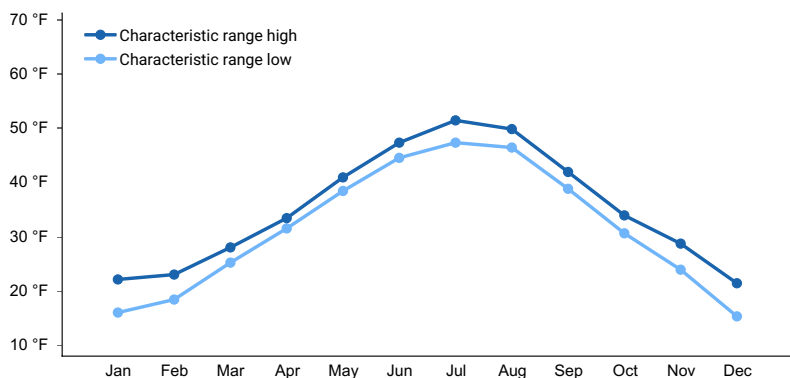


Figure 2. Monthly minimum temperature range

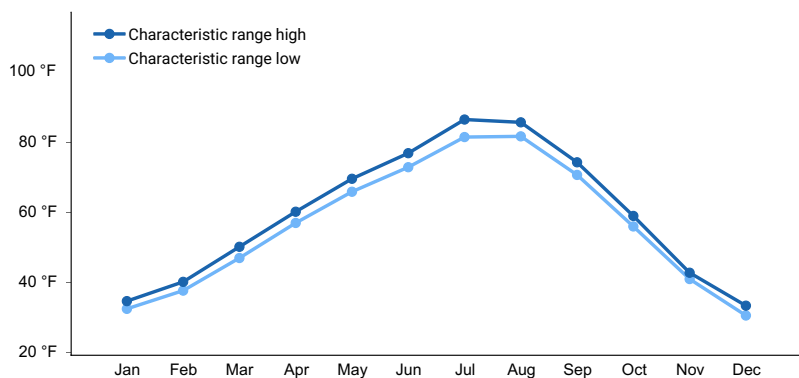


Figure 3. Monthly maximum temperature range

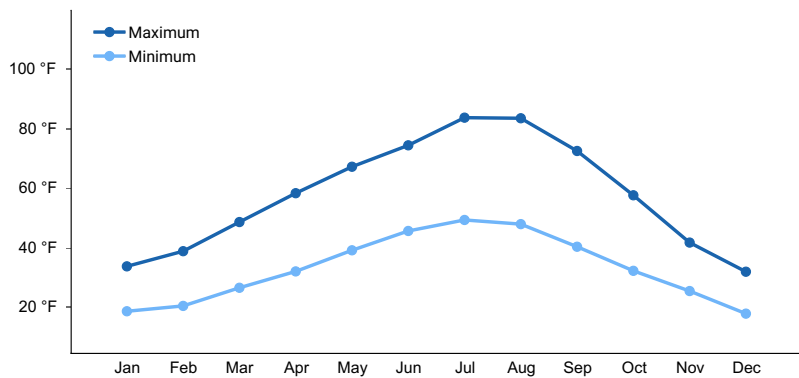


Figure 4. Monthly average minimum and maximum temperature

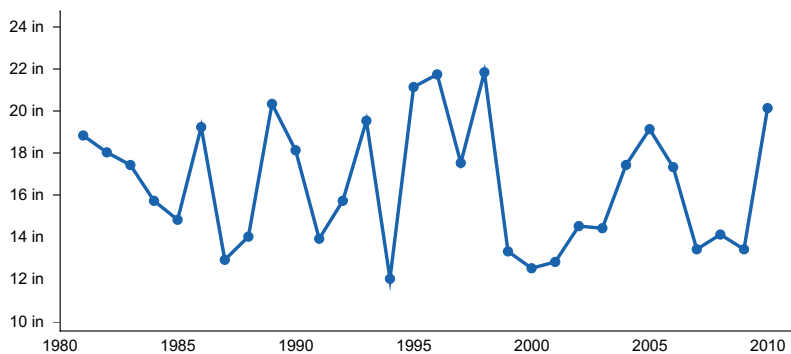


Figure 5. Annual precipitation pattern

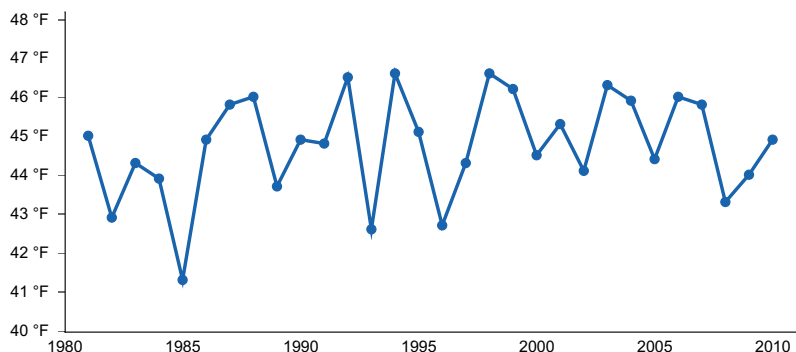


Figure 6. Annual average temperature pattern

Climate stations used

- (1) BONNERS FERRY [USC00101079], Bonners Ferry, ID
- (2) SANDPOINT EXP STN [USC00108137], Sandpoint, ID
- (3) EUREKA RS [USC00242827], Eureka, MT
- (4) FORTINE 1 N [USC00243139], Eureka, MT
- (5) HERON 2 NW [USC00244084], Heron, MT
- (6) TROY [USC00248390], Troy, MT
- (7) KALISPELL 9 NNE [USC00244560], Kalispell, MT
- (8) CRESTON [USC00242104], Kalispell, MT
- (9) POLSON [USC00246635], Polson, MT
- (10) TROUT CREEK RS [USC00248380], Trout Creek, MT
- (11) MISSOULA INTL AP [USW00024153], Missoula, MT
- (12) STEVENSVILLE [USC00247894], Stevensville, MT
- (13) DRUMMOND AVIATION [USW00024139], Drummond, MT
- (14) DEER LODGE 3 W [USC00242275], Deer Lodge, MT
- (15) 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 Soil saline or sodic (EC greater than 7mmhos or SAR greater than 12 within surface 18 cm)
- o Not limy (Soil is not strongly or violently effervescent (CaCO₃ greater than 14 percent) in surface mineral 18 cm) –

can have calcium carbonates in the subsurface.

o Moderately deep, deep or very deep

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 silty clay loam, silt loam in surface mineral 4 inches

• Parent material is alluvium, lacustrine deposits

• Drainage class is well drained; no flooding frequency

Table 4. Representative soil features

Parent material	(1) Alluvium (2) Lacustrine deposits
Surface texture	(1) Silty clay loam (2) Silt loam
Drainage class	Well drained
Soil depth	20–60 in
Surface fragment cover >3"	0–15%
Electrical conductivity (Depth not specified)	Not specified
Sodium adsorption ratio (Depth not specified)	Not specified

Table 5. Representative soil features (actual values)

Drainage class	Not specified
Soil depth	Not specified
Surface fragment cover >3"	Not specified
Electrical conductivity (Depth not specified)	7 mmhos/cm
Sodium adsorption ratio (Depth not specified)	12

Ecological dynamics

1.1 Western wheatgrass, thickspike wheatgrass, needle and thread, Basin wildrye dominant plants. Inland saltgrass and blue grama present as subordinate plants. Forbs are very low cover. Black greasewood dominant with Big sagebrush, Gardner's saltbush, yellow rabbitbrush less dominant shrubs. Saltbush and winterfat present. Bare ground is typically naturally high.

1.1a Fire disturbance

1.2a Recovery from fire disturbance with time

1.2 Grasses recover from quick moving and low severity fire more quickly than shrubs and there may be a flush of forbs initially. Black greasewood recovers faster than big sagebrush and maybe more dominant early in recovery. A slow moving and/or more severe fire will cause a longer recovery time.

1.1b Extended drought, improper grazing, climate change

1.3 Western wheatgrass and Alkali sacaton remain dominant, Mid-statured decreaser bunchgrasses will be rare. Saltgrass and other shortgrasses increasing. Large shrub production remains similar to 1.1 however subshrubs like broom snakeweed and fringed sagewort increase. Bare ground remains high

1.3a Proper grazing management, favorable growing conditions, time

2.1 Shortgrass dominated (Saltgrass, Alkali (Sandberg) bluegrass). Forbs remain a small component of community. Saltbush takes on a prostrate growing form. Large gaps between sagebrush and greasewood 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. Forbs particularly Chenopods (namely sumpweed) common, Cheatgrass invades. Cactus common. Big sagebrush and Black greasewood are less dominant large shrub component.

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

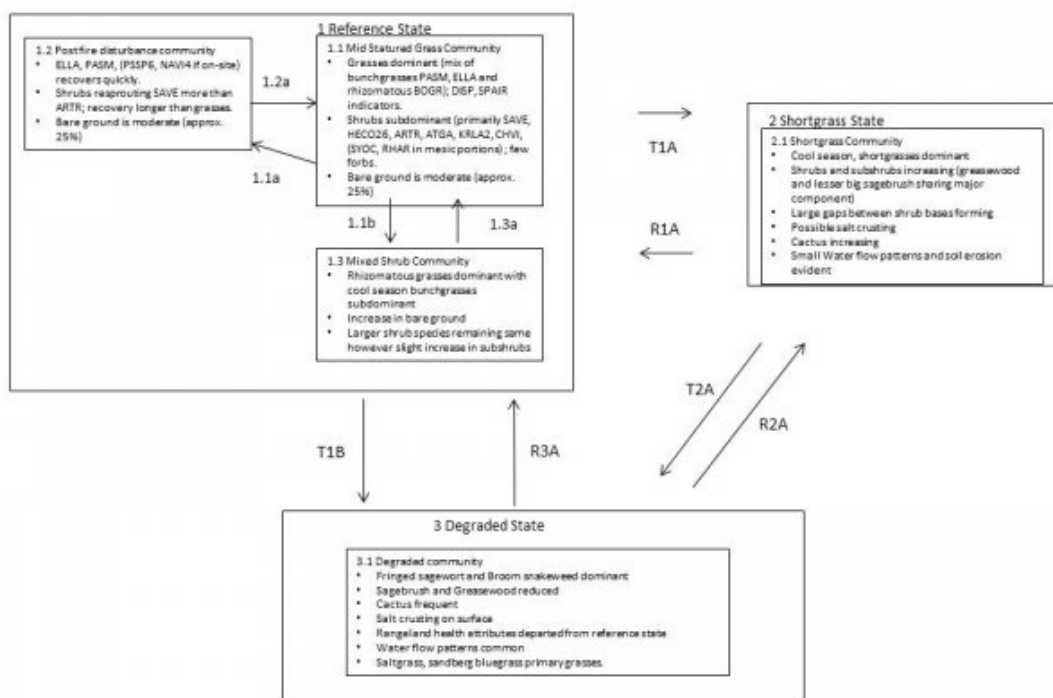
T2A Overgrazing, introduction of weeds, drought, heavy human disturbance, conversion to introduced species

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

Saline-Sodic Shrubland R044AP804MT



Legend

Pathways

1.1a Fire disturbance

1.2a Recovery from fire disturbance with time

1.1b Extended drought, improper grazing, climate change

1.3a Proper grazing management, favorable growing conditions, time

Transitions

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

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

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

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	05/10/2025
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:**
