USDA Natural Resources Conservation Service

Ecological site R043AY507WA
Cool-Mesic Dry-Xeric Loamy Low AWC (PSSP/FEID/ACNE)

Last updated: 10/15/2020
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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): 043A–Northern Rocky Mountains

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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.

LRU notes

Major land resource area (MLRA): 043A-Northern Rocky Mountains
Modal LRU – 43A01 - Okanogan Plateau

This LRU is composed predominantly of glaciated mountains and foothills. The soils tend to be loamy to sandy andisols, inceptisols, and mollisols with mixed or distinct ash surfaces. Recent alluvium, till, outwash and residuum from granitic or metamorphic rock are the dominant parent materials. Soil climate is a frigid or cryic temperature regime and xeric moisture regime with average annual precipitation around 450 mm (18 inches).

Others where occurring: 43A03 Columbia-Colville Valleys
44A01 Spokane-Rathdrum Outwash Plains

Classification relationships

This ES group fits into the National Vegetation Standard's Central Rocky Mountain Foothill Grassland Group and is most closely related to Washington State's Natural Heritage Program's Northern Rocky Mountain Lower Montane, Foothill, and Valley Grassland. (Compare to previous Washington range sites: R043AY201WA, DRY STONY 16-24 PZ and R043AY202WA, STONY 16-24 PZ)

Ecological site concept

Ecological Site Concept:

This ES is found on well drained, loamy sites with mesic temperatures and a plant community dominated by grass species such as bluebunch wheatgrass, Idaho fescue and columbia needlegrass. The ESD is distinguished by having available water capacity of <3 inches total within 40 inches of the surface.

Table 1. Dominant plant species

Tree	Not specified

Shrub	(1) *Symphoricarpos albus* (2) *Rosa woodsii*
Herbaceous	(1) *Pseudoroegneria spicata* (2) *Festuca idahoensis*

Physiographic features

Physiographic Features
This ecological site occurs mainly on hillslopes, lower mountain slopes, outwash terraces and stream terraces. Parent materials are primarily till, outwash or colluvium and residuum from metamorphic rock with a mantle of volcanic ash and loess.

Landscapes: Mountains, Foothills, Valleys and Scablands
Landforms: hillslopes, mountain slopes, outwash terraces, plateaus

Elevation:
Total range = 380 to 1675 m
(1,255 to 5,485 feet)
Central tendency = 865 to 1190 m
(2,840 to 3,900 feet)

Slope (percent):
Total range = 0 to 100 percent
Central tendency = 25 to 55 percent

Water Table Depth:
>200cm
(>80 in)

Flooding:
Frequency: None
Duration: None

Ponding:
Frequency: None
Duration: None

Aspect: 65-210-340
Central tendency: 150-210-305

Table 2. Representative physiographic features

Landforms	(1) Mountains > Mountain slope (2) Foothills > Hillslope (3) Valley > Outwash terrace
Elevation	866–1,189 m
Slope	25–55%
Water table depth	0 cm
Aspect	W, NW, SE, S, SW

Table 3. Representative physiographic features (actual ranges)

Elevation	383–1,672 m
Slope	0–100%
Water table depth	0 cm

Climatic features

Climatic Features

During the spring and summer, a circulation of air around a high-pressure center brings a prevailing westerly and northwesterly flow of comparatively dry, cool and stable air into the region. As the air moves inland, it becomes warmer and drier which results in a dry season beginning in the late spring and reaching a peak in mid-summer. In the fall and winter, a circulation of air around two pressure centers over the ocean brings a prevailing southwesterly and westerly flow of air into the Pacific Northwest. This air from over the ocean is moist and near the temperature of the water. Condensation occurs as the air moves inland over the cooler land and rises along the windward slopes of the mountains or highlands. This results in a wet season beginning in October, reaching a peak in winter, then gradually decreasing in the spring.

The elevation within the LRU varies from approximately 1,000 feet in the lower river valleys to about 7,200 feet in the higher mountains. The annual precipitation increases from 9 inches in the valleys to over 48 inches in the highest mountains. Winter season snowfall averages about 43 inches. Both rainfall and snowfall increase with elevation. Snow can be expected after the first of November and to remain on the ground from the first of December until March or April.

In January, the average maximum temperature is near 29° F and the minimum temperature is 14° F. Minimum temperatures from -5° to -20°F are recorded almost every winter and temperatures ranging to -25° F have been recorded. In July, the average maximum temperature is 81° and the minimum temperature 47° F. Maximum temperatures reach 100° F on a few afternoons each summer and temperatures as high as 108° F have been recorded. The average date of the last freezing temperatures can be expected by early-June and after early-September in the warmer areas.
(Compiled from WRCC: Climate of Washington and available station data)

Frost-free period (days):
Total range = 80 to 135 days
Central tendency = 95 to 110 days

Mean annual precipitation (cm):
Total range = 265 to 710 mm
(10 to 28 inches)
Central tendency = 410 to 530 mm
(16 to 21 inches)

MAAT (C)
Total range = 3.8 to 9.6
(39 to 49 F)
Central tendency = 5.7 to 7.3
(42 to 45 F)

Climate stations: CHESAW 4 NW, DOMKE LAKE, HOLDEN, HOLDEN VILLAGE, LUCERNE, MARCUS, MILTON RANCH, ORIENT, REX CREEK, Iron Mountain

Influencing water features

Water Table Depth:
>200cm
(>80 in)

Flooding:
Frequency: None
Duration: None

Ponding:
Frequency: None
Duration: None

Soil features

Representative Soil Features
This ecological site is associated with the Baldknob, Chesaw, Conconully, Johntom, Leftcreek, Lithic Haploxerepts, Raisio, Rockly, Rufus, Storer, Swakane, Vallan, and Wynhoff series. The soils are Entic Haploxerolls, Entic Ultic Haploxerolls, Lithic Haploxerepts, Lithic Haploxerolls, Lithic Ultic Haploxerolls, Lithic Vitrixerands, Typic Haploxerolls, and Vitrandic Haploxerolls. These soils have developed in a variety of materials. These include till, outwash, glaciolacustrine deposits as well as colluvium and residuum from granite, metamorphic and volcanic rocks. Most sites have a surface influenced by volcanic ash and loess. Volcanic ash layers are mixed at lower elevations and form distinct, thicker layers at higher elevations.

Parent Materials:
Kind: volcanic ash, loess, till, outwash, glaciolacustrine
Origin: mixed
Kind: colluvium, residuum
Origin: granite, metamorphics, metasediments, basalt, andesite, metavolcanics and rhyolite

Surface Texture: (<2mm fraction)
(1) Ashy-Loam
(2) Ashy-Sandy Loam
(3) Loam

Surface Fragments

Table 4. Representative soil features

Parent material	(1) Volcanic ash (2) Loess (3) Till (4) Outwash (5) Lacustrine deposits (6) Residuum–igneous and metamorphic rock
Surface texture	(1) Ashy loam (2) Ashy sandy loam (3) Loam
Drainage class	Well drained
Permeability class	Moderate
Depth to restrictive layer	41 cm
Surface fragment cover <=3"	0%
Surface fragment cover >3"	0%
Available water capacity (0-101.6cm)	4.57 cm
Calcium carbonate equivalent (0-152.4cm)	0%
Electrical conductivity (0-152.4cm)	0 mmhos/cm
Sodium adsorption ratio (0-152.4cm)	0
Soil reaction (1:1 water) (0-152.4cm)	7

Table 5. Representative soil features (actual values)

Drainage class	Well drained
Permeability class	Very slow to rapid
Depth to restrictive layer	15–203 cm
Surface fragment cover <=3"	0%
Surface fragment cover >3"	0–9%
Available water capacity (0-101.6cm)	1.27–6.86 cm
Calcium carbonate equivalent (0-152.4cm)	0%
Electrical conductivity (0-152.4cm)	0 mmhos/cm
Sodium adsorption ratio (0-152.4cm)	0
Soil reaction (1:1 water) (0-152.4cm)	6.1–7.8

Ecological dynamics

State and transition model

Figure 1. Narrative

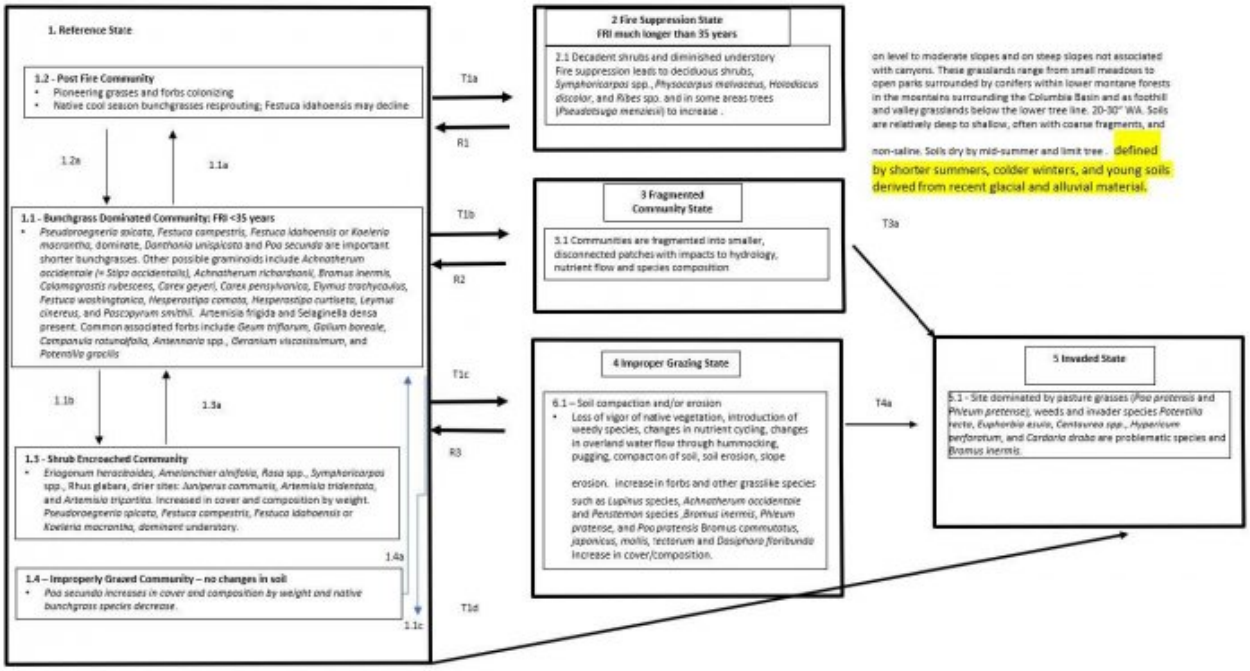

Figure 2. STM

References

. USNVC [United States National Vegetation Classification]. 2019. United States National Vegetation Classification Database, V2.03. Federal Geographic Data Committee, Vegetation Subcommittee, Washington DC.. USNVC: http://usnvc.org/.

Gerald, R. 2004. NRCS - Washington; Interim Ecological Site Descriptions for Rangeland.

Rocchio, J.F. and R.C. Crawford. 2015. Ecological systems of Washington State. A guide to identification. Washington Department of Natural Resources.. Natural Heritage Report.. Washington Department of Natural Resources, Natural Heritage Program, Olympia, WA. 1–397.

Contributors

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Approval

Curtis Talbot, 10/15/2020

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	08/17/2024
Approved by	Curtis Talbot
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:**