Ecological site F043AY533WA
Cool-Frigid, Dry-Xeric, Loamy Mountainsides
(Aspen Cool Grass)
Populus tremuloides/Calamagrostis rubescens

Last updated: 4/11/2025
Accessed: 04/21/2026

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

Major land resource area (MLRA): 043A-Northern Rocky Mountains 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

LRU notes

Modal LRU – 43A01 Okanogan Plateau This LRU is composed predominantly of mid to high elevation mountain slopes. The soils are loamy Xerolls,, Xerands or Xerepts with ashy surfaces. Till from sedimentary or other rock is the dominant parent material. Soil climate is a frigid or cryic temperature regime and xeric moisture regime with average annual precipitation around 470mm (19 inches).

Classification relationships

United States National Vegetation Classification (2019), CEGL000575 Populus tremuloides / Calamagrostis rubescens Forest Washington Natural Heritage Program. Ecosystems of Washington State, A Guide to Identification, Rocchio and Crawford, 2015 - Rocky Mountain Aspen Forest and Woodland Description of Ecoregions of the United States, USFS PN # 1391, 1995 - M333 Northern Rocky Mt. Forest-Steppe-Coniferous Forest-Alpine Meadow Province Level III and IV Ecoregions of WA, US EPA, June 2010 –15x Okanogan Highland Dry Forest, 15y Selkirk Mountains. This ecological site includes the following USDA Forest Service Plant Association: POTR/CARU (Williams et. al. 1983)

Ecological site concept

Ecological Site Concept: The data below describes the physiographic, climatic and other parameters for the Quaking Aspen/Pinegrass. This vegetation alliance is of limited extent and frequently occurs as an inclusion in more extensive ecological types. Soils are loamy with some influence of volcanic ash in surface layers. A Perched water table is at >25 inches depth and available water holding capacity is moderate to high.

Table 1. Dominant plant species

Tree	(1) *Populus tremuloides* (2) *Larix occidentalis*
Shrub	(1) *Paxistima myrsinites* (2) *Shepherdia canadensis*
Herbaceous	(1) *Calamagrostis rubescens* (2) *Achillea millefolium*

Physiographic features

Physiographic Features
This ecological site occurs mainly on forested backslopes of mountains and side slopes of associated drainageways. Parent materials are till derived from mixed origins thinly mantled by mixed volcanic ash and loess.

Landscapes: Mountains

Landforms: Mountain slope, drainageways

Elevation:
Total range = 915 to 1675 m; median = 1235 m
(3,000 to 5,495 feet; median = 4,050 feet)

Slope (percent):
Total range = 3 to 65 percent
Median = 25 percent

Water Table Depth:
90-170 cm
(35-70 inches)

Flooding:

Frequency: None
Duration: None

Ponding:

Frequency: None
Duration: None

Aspect: 248-23-113

Table 2. Representative physiographic features

Landforms	(1) Mountains > Mountain slope (2) Mountains > Drainageway
Flooding frequency	None
Ponding frequency	None
Elevation	1,230 m
Slope	30 %
Water table depth	110 cm
Aspect	W, NW, N, NE, E

Table 3. Representative physiographic features (actual ranges)

Flooding frequency	None
Ponding frequency	None
Elevation	910 – 1,680 m
Slope	0 – 70 %
Water table depth	60 – 180 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 1,205 feet in the lower river valleys to over 7,200 feet in the higher terrain. The annual precipitation increases from 14 inches in the valleys to over 45 inches over the higher mountains. Winter season snowfall varies from 30 to 50 inches. Both rainfall and snowfall increase in the higher elevations. 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 31° F and the minimum temperature is 18° F. Minimum temperatures from -10° to -20°F are recorded almost every winter and temperatures ranging to -30° F have been recorded. In July, the average maximum temperature is 85° to 90° and the minimum temperature 45° to 50° F. Maximum temperatures reach 100° F on a few afternoons each summer and temperatures between 105° to 110° F have been recorded. Temperatures in the mountains decrease three to five degrees Fahrenheit with each 1,000 feet increase in elevation. The average date of the last freezing temperatures can be expected by mid-May and before mid-October in the warmer areas.
(Compiled from WRCC: Climate of Washington and available station data)

Frost-free period (days):
Total range = 70 to 120 days
Median = 115 days

Mean annual precipitation (cm):
Total range = 355 to 760 mm
(14 to 30 inches)
Median = 480 mm
(19 inches)
MAAT (C)
Total range = 2.8 to 6.7
(37 to 44 F)
Median = 5.6
(42 F)

Climate stations: none

Influencing water features

Water Table Depth:
90-170 cm
(35-70 inches)

Soil features

Representative Soil Features

This ecological site is associated the soil component Koepke . This component is Vitrandic Haploxerolls. These soils have developed in mixed Mazama tephra deposits over glacial till. The tephra influenced layers are important for forest productivity. Where present in sufficient thickness they can: retain large amounts of water compared to other parent materials, increase cation exchange capacity and have high availability of organically bound plant nutrients.

Parent Materials:
Kind: Tephra (volcanic ash)
Origin: mixed
Kind: Till,
Origin: mixed

Surface Texture: (2mm fraction)
(1) Ashy Silt Loam
(2) Ashy Loam

Surface Fragments

Table 4. Representative soil features

Parent material	(1) Volcanic ash (2) Till
Surface texture	(1) Ashy silt loam (2) Ashy loam
Drainage class	Moderately well drained
Permeability class	Moderate
Depth to restrictive layer	70 – 110 cm
Available water capacity (0-101.6cm)	13.72 cm
Calcium carbonate equivalent (0-152.4cm)	Not specified
Soil reaction (1:1 water) (25.4-152.4cm)	6.7

Subsurface fragment volume <=3" (25.4-152.4cm)	30 %
Subsurface fragment volume >3" (25.4-152.4cm)	10 %

Table 5. Representative soil features (actual values)

Drainage class	Moderately well drained to well drained
Permeability class	Slow to moderate
Depth to restrictive layer	50 – 150 cm
Available water capacity (0-101.6cm)	13.21 – 20 cm
Calcium carbonate equivalent (0-152.4cm)	0 %
Soil reaction (1:1 water) (25.4-152.4cm)	6.1 – 7.3
Subsurface fragment volume <=3" (25.4-152.4cm)	10 – 40 %
Subsurface fragment volume >3" (25.4-152.4cm)	0 – 30 %

Ecological dynamics

State and transition model

Additional community tables

Table 6. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)

References

Williams, C.K., B.F. Kelley, B.G. Smith, and T.R. Lillybridge. October, 1995. Forested Plant Associations of the Colville National Forest.

Williams, C.K. and T.R. Lillybridge. 1983. Forested Plant Associations of the Okanogan National Forest R6-Ecol-132b-1983.

Approval

Kirt Walstad, 4/11/2025

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	12/18/2020
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:**

---

17. **Perennial plant reproductive capability:**