USDA Natural Resources Conservation Service

Ecological site F043AY506WA
Warm Mesic Xeric Loamy Foothills/Mountainsides, mixed ash surface (Ponderosa Pine Dry Shrub, Grass) Pinus ponderosa / Purshia tridentata – Festuca idahoensis - Pseudoroegneria spicata

Last updated: 3/11/2019
Accessed: 05/12/2025

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): 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.

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

LRU notes

Most commonly found in LRU 43A03 (Columbia-Colville Valleys).

This LRU is composed predominantly of glaciated foothills, lower mountain slopes and outwash terraces near the

Columbia and Colville Rivers. The LRU is in the portion of the Northern Rocky Mountains that was subjected to continental glaciation. The soils tend to be loamy mollisols and inceptisols with thin to mixed volcanic ash surfaces. Till and outwash are the dominant parent materials though colluvium and residuum from granitic and /or metamorphic geology are also common.. Soil climate is a dominantly mesic or frigid temperature regime and xeric moisture regime with average annual precipitation around 495 mm (19 inches) and an average annual air temperature around 8.2 degrees C (47 degrees F). Elevation ranges from about 370 to 1030 m (1,200 to 3,380 feet).

Classification relationships

Relationship to Other Established Classifications:

United States National Vegetation Classification (2008) – A3446 Ponderosa Pine / Shrub Understory Central Rocky Mt. Forest & Woodland Alliance

Washington Natural Heritage Program. Ecosystems of Washington State, A Guide to Identification, Rocchio and Crawford, 2015 – Northern Rocky Mountain Ponderosa Pine Woodland and Savanna

Description of Ecoregions of the United States, USFS PN # 1391, 1995 - M332 Middle Rocky Mountain Steppe–Coniferous Forest -Alpine Meadow Province

Level III and IV Ecoregions of WA, US EPA, June 2010 - 15r Okanogan – Colville Xeric Valleys & Foothills

This ecological site includes the following USDA Forest Service Plant Associations: PIPO/PUTR, PIPO/PUTR-FEID, and PIPO/PUTR-PSSP. (Williams et. al. 1995)

Ecological site concept

This site consists of hillslopes, outwash terraces and lower mountain slopes with the following characteristics: loamy soil materials; a volcanic ash surface less than than 7 inches thick; a water table (perched or apparent) greater than 75 cm (30 in) below the soil surface during the April to October period; PIPO/PUTR-FEID, PIPO/PUTR-PSSP6 habitat types.

Table 1. Dominant plant species

Tree	(1) *Pinus ponderosa*
Shrub	(1) *Purshia tridentata*
Herbaceous	(1) *Festuca idahoensis* (2) *Pseudoroegneria spicata*

Physiographic features

Physiographic Features
Landscapes: Foothills, Valleys, Mountains
Landform: sideslopes, foot slopes, lake terraces, outwash terraces

Elevation (m): Total range = 355 to 1495 m
(1,165 to 4,900 feet)
Core Concept = 685 to 1,010 m
(2,245 to 3,310 feet)

Slope (percent): Total range = 0 to 80 percent
Core Concept = 15 to 40 percent

Table 2. Representative physiographic features

Landforms	(1) Mountains > Mountain slope (2) Foothills > Hillslope (3) Valley > Outwash terrace (4) Valley > Lake terrace
Flooding frequency	None
Ponding frequency	None
Elevation	684–1,009 m
Slope	15–40%
Aspect	SE, S, SW

Table 3. Representative physiographic features (actual ranges)

Flooding frequency	Not specified
Ponding frequency	Not specified
Elevation	355–1,494 m
Slope	0–80%

Climatic features

Climatic Features
Frost-free period (days): Total range = 85 to 145 days
Core Concept = 105 to 125 days

Mean annual precipitation (cm): Total range = 265 to 735 mm
(10 to 29 inches)
Core Concept = 335 to 495 mm
(13 to 19 inches)

MAAT Total range = 4.4 to 10.3 C
(40 to 51 F)
Core Concept = 7.0 to 7.9
(45 to 46 F)

Climate Stations: none

Table 4. Representative climatic features

Frost-free period (characteristic range)	105-125 days
Freeze-free period (characteristic range)	
Precipitation total (characteristic range)	330-483 mm
Frost-free period (actual range)	85-145 days
Freeze-free period (actual range)	
Precipitation total (actual range)	254-737 mm

Influencing water features

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

Flooding:
Frequency: None
Duration: None

Ponding:
Frequency: None
Duration: None

Soil features

Representative Soil Features

This ecological subsite is associated with several soil series (e.g. Bong, Burnscreek, Donavan, Georgecreek, Hellgate, Leiko, Peka, Setill, Sinlahekin, Spokane, Whitestone). The soil components can be grouped into: Vitrandic Haploxerolls, Vitrandic Argixerolls, Pachic Ultic Haploxerolls, and Ultic Haploxerolls. These soils have developed in mixed Mazama tephra, loess and other deposits over till, outwash, residuum and colluvium from granitic and metasedimentary rock, and glaciolacustrine material. The soils range from moderately deep to very deep and have adequate available water capacity to a depth of 1 m. The soils are mostly well-drained (~90% by area).

Table 5. Representative soil features

Parent material	(1) Volcanic ash (2) Till (3) Outwash (4) Alluvium (5) Residuum–granite (6) Colluvium–granite
Surface texture	(1) Ashy loam (2) Ashy sandy loam (3) Ashy silt loam
Drainage class	Well drained
Depth to restrictive layer	152 cm
Soil depth	152 cm
Available water capacity (0-101.6cm)	9.14 cm
Calcium carbonate equivalent (0-152.4cm)	0%
Soil reaction (1:1 water) (0-152.4cm)	Not specified
Subsurface fragment volume <=3" (25.4-101.6cm)	25%

Table 6. Representative soil features (actual values)

Drainage class	Not specified
Depth to restrictive layer	76–203 cm
Soil depth	76–203 cm
Available water capacity (0-101.6cm)	7.62–16 cm
Calcium carbonate equivalent (0-152.4cm)	0–5%
Soil reaction (1:1 water) (0-152.4cm)	5.5–7.4
Subsurface fragment volume <=3" (25.4-101.6cm)	4–70%

Ecological dynamics

A description of vegetation dynamics and a state and transition model can be found in Ecological Site Group EX043AESG02.

State and transition model

Approval

Scott Woodall, 3/11/2019

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):**

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9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):**

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10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:**

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11. **Presence and thickness of compaction layer (usually none; describe soil profile features which may be mistaken for compaction on this site):**

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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:

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13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):**

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14. **Average percent litter cover (%) and depth (in):**

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15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):**

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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:**
