

Ecological site F043AY536ID

Shallow Canyons and Hillsides

23-25" PZ Mesic

Eastern Columbia Plateau Embayments

Last updated: 4/09/2025

Accessed: 08/31/2026

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

Most commonly found in LRU 43A07 (Eastern Columbia Plateau Embayments) and 43A09 (Western Bitterroot Foothills). Climate parameters were obtained from PRISM and other models for the area. Landscape descriptors are derived from USGS DEM products and their derivatives.

Classification relationships

Relationship to Other Established Classifications: United States National Vegetation Classification (2008) – A3447 Ponderosa Pine / Herbaceous 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 Mt. Forest-Steppe-Coniferous Forest-Alpine Meadow Province Level III and IV Ecoregions of WA, US EPA, June 2010 - 15r Okanogan – Colville Xeric Valleys & Foothills and 15s Spokane Valley Outwash Plains This ecological site includes the following USDA Forest Service Plant Associations: PIPO/PSSP, PIPO/FEID, and PIPO-PSME/PSSP. (Williams et. al. 1995)

Ecological site concept

This ESD is distinguished by an overstory of Ponderosa pine. Understory is grass dominated. Grass species are dominantly bluebunch wheatgrass and Idaho fescue. Forbs include arrowleaf balsamroot, sticky geranium, yarrow and lupine.. It occurs on foothills, canyon sides, and escarpments. Soils are derived from basalt and have a low available water capacity due to a lithic contact within 20 inches. This ES group fits into the National Vegetation Standard's Ponderosa Pine / Herbaceous Understory Central Rocky Mt. Forest & Woodland Alliance and Washington State's Natural Heritage Program's Northern Rocky Mountain Ponderosa Pine Woodland and Savanna.

Table 1. Dominant plant species

Tree	(1) <i>Pinus ponderosa</i>
Shrub	Not specified

Herbaceous	(1) <i>Pseudoroegneria spicata</i> (2) <i>Festuca idahoensis</i>
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Physiographic features

Physiographic Features

Landscapes: Canyonlands, Plateaus

Landform: hill slopes, canyon walls, escarpments

Elevation (m): Total range = 620 to 915 m

(2,035 to 3,000 feet)

Central tendency = 720 to 795 m

(2,360 to 2,610 feet)

Slope (percent): Total range = 0 to 70 percent

Central tendency = 12 to 35 percent

Aspect (degrees):

60-195-345

Central tendency = 105-195-255

Table 2. Representative physiographic features

Landforms	(1) Canyonlands > Canyon wall (2) Plateau > Hillslope (3) Canyonlands > Escarpment
Flooding frequency	None
Ponding frequency	None
Elevation	720 – 800 m
Slope	10 – 40 %
Aspect	W, E, SE, S, SW

Table 3. Representative physiographic features (actual ranges)

Flooding frequency	None
Ponding frequency	None
Elevation	620 – 910 m
Slope	0 – 70 %

Climatic features

Climatic Features

The climate of this portion of the MLRA is controlled by a combination of large-scale and small-scale factors. The large-scale factors here include latitude, relative position on the North American continent, prevailing hemispheric wind patterns, and extensive mountain barriers. Small-scale or local factors include the topographic setting and position (valley, slope, or ridge location), as well as orientation or aspect, and vegetative cover. Elevation may cover various scales. Broadly, the climate is transitional between a northern Pacific coastal type and a continental type. The Pacific influence is noted particularly by the late autumn and winter maximum in cloudiness and precipitation; also in the relatively moderate average winter temperatures, compared with areas east of the Rocky Mountains. Summer is characteristically sunny and dry, though July and August are the only distinct summer months. July and August are thus also the peak fire-danger months. Annual precipitation (rain and melted snow) averages as little as 10 inches at the lowest canyon floors; over 100 inches at the highest elevations. Wettest months are normally November, December, and January. Close to 60 percent of the annual total occurs during the period November through March. A slight, secondary peak in precipitation normally appears in May and June, followed by a sharp decrease in July. Snowfall accounts for more than 50 percent of the total precipitation at elevations above 4,800 ft. Snow cover usually persists in the mid elevation valleys from early December through the end of March. High-elevation snowpack reaches a depth of 5 ft (1.5 m) or more in March and April and may linger into June. The main season of lightning (or thunderstorm) activity extends from late May through August. Storms occur on an average of 3 or 4 days each in June, July, and August. Monthly mean temperatures in populated valley locations range from 24 F (-4 C) in January to 65 F (18 C) in July; these are midpoint values between the average daily maximum and minimum temperatures. The annual mean is 43 F (6 C). A large diurnal range occurs in summer. Extreme temperatures have been as high as 103° to 105° F (about 40° C) and as low as -36° F (-38° C). Temperature inversions are commonplace, particularly on the clear summer and early autumn nights. The frost-free season, defined as the period with minimum temperatures staying above 32° F (0° C), varies widely with elevation and topographic position. The season is generally longer at lower elevation locations and on slope positions in the "thermal belt" around 3,500 ft. The season is shorter in positions affected by cold air drainage and slopes above the "thermal belt" at elevations >5,500 ft. Relative humidity is usually high throughout the day in late autumn and winter, averaging 70 to 80 percent or higher in midafternoon. In July and August, afternoon values average near 35 percent in the mid elevation valleys and 45 percent at 5,500 ft. Summer nighttime humidity in these valleys typically recovers to over 90 or 95 percent by dawn. On the slopes above the temperature inversion, at the same time, humidity may average only 50 to 60 percent. Winds have a prevailing (most frequent) direction from the southwest during all or most of the year. Local terrain effects modify the larger-scale wind that occurs in the adjacent free atmosphere. A nighttime drainage effect is common. Sunshine duration is at a minimum in December, when it may average only 20 percent of the maximum possible. July has close to 80 percent of the maximum possible.

(from Finklin, A. 1983. Climate of Priest River Experimental Forest, Northern Idaho.GTR-INT-159

Frost-free period (days):

Total range = 90 to 145 days

Central tendency = 110 to 125 days

Mean annual precipitation (cm):

Total range = 435 to 930 mm

(17 to 37 inches)

Central tendency = 590 to 725 mm

(23 to 29 inches)

MAAT (C)

Total range = 6.4 to 10.5

(43 to 51 F)

Central tendency = 7.9 to 9.0

(46 to 48 F)

Climate stations: Dworshak Dam, Dworshak Fish Hatchery, Orofino, Orofino Telemark

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 the Lacy series. These soils have developed in loess and colluvium and residuum derived from basalt. The soils are shallow and have low available water capacity to a depth of 1 m. The soils are well drained.

Table 4. Representative soil features

Parent material	(1) Loess (2) Residuum – basalt (3) Colluvium – basalt
Surface texture	(1) Gravelly loam
Drainage class	Well drained
Permeability class	Moderate
Depth to restrictive layer	50 cm
Soil depth	50 cm
Surface fragment cover >3"	Not specified
Available water capacity (0-101.6cm)	6.1 cm
Calcium carbonate equivalent (0cm)	Not specified
Electrical conductivity (0cm)	Not specified
Subsurface fragment volume <=3" (25.4-101.6cm)	20 %
Subsurface fragment volume >3" (25.4-101.6cm)	20 %

Table 5. Representative soil features (actual values)

Drainage class	Well drained
Permeability class	Moderate
Depth to restrictive layer	30 – 50 cm
Soil depth	30 – 50 cm
Surface fragment cover >3"	0 %
Available water capacity (0-101.6cm)	5.59 – 6.86 cm
Calcium carbonate equivalent (0cm)	0 %
Electrical conductivity (0cm)	0 mmhos/cm
Subsurface fragment volume <=3" (25.4-101.6cm)	10 – 30 %
Subsurface fragment volume >3" (25.4-101.6cm)	0 – 40 %

Ecological dynamics

Ecological Dynamics of the Site

This reference site is located on very warm dry slopes with ponderosa pine the only tree species with an understory of mainly bluebunch wheatgrass, Idaho Fescue, and some needle and thread grass. Tree stocking is low with large open grown ponderosa pine and small amounts of sapling/pole size pine in understory. Frequent ground fires every 10-15 years kept pine regeneration low and perpetuated this condition with a dominant grass understory. With fire exclusion a mosaic of pine cohorts underneath the large pine survive and a patchy woodland develops. In addition, some woodland shrubs may establish and an occasional Douglas-fir may be present. Stands in this altered state are subject to beetle kill and mistletoe infestation. Soils are mainly sandy loams or loamy sands. The main habitat types included in this ecological site are Ponderosa pine/blunhwheat grass and Ponderosa pine/Idaho fescue.. The bluebunch wheatgrass sites occur on the warmer drier slopes and the Idaho fescue sites occur on the lower slopes and more level terrain. Both habitat types have similar ecological processes as described above. The fescue sites will have more pine stand density due to a little more moisture and topographic position.

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 (%)
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Table 7. Community 1.2 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
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Table 8. Community 1.3 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
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Table 9. Community 1.4 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
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Table 10. Community 2.1 plant community composition

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

. 1998. NRCS National Forestry Manual.

. 2017. NRCS Soil and Site Index data for NE WA and N. Idaho.

Cooper, S.V., K.E. Neiman, R. Steele, and D.W. Roberts. 1991. Forest Habitat types of Northern Idaho, A Second Approximation.

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

Zack, A. 1997. Biophysical Classification- Habitat Groups and Description of Northern Idaho and Northwestern Montana, Lower Clarkfork and Adjacent Areas..

Approval

Kirt Walstad, 4/09/2025

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:
