Ecological site F043AY564ID
Vitrandic Metasedimentary Hills and Mountains
30-45" PZ Frigid
Western Bitterroot Foothills

Last updated: 4/11/2025
Accessed: 11/10/2026

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 43A09 (Western Bitterroot Foothills). Also found in adjacent areas of 43A11 (Bitterroot Metasedimentary Zone). 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) – A3362 Grand fir – Douglas-fir Central Rocky Mt. Forest and Woodland Alliance. Washington Natural Heritage Program. Ecosystems of Washington State, A Guide to Identification, Rocchio and Crawford, 2015 – Northern Rocky Mt. Mesic Montane Mixed Conifer Forest. 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 -15w Western Selkirk Maritime Forest. 15y Selkirk Mountains. 15u Inland Maritime Foothills and Valleys. This ecological site includes the following USDA Forest Service Plant Associations: ABGR/ACGLD/CLUN, Forest Plant Associations of the Colville Nat. Forest (Williams et. al. 1995) and ABGR/CLUN (Forest Habitat Types of N. Idaho, A Second Approximation, USFS Revised 1991.

Ecological site concept

This ES group is distinguished by an overstory of grand fir and Douglas-fir. Understory shrubs can include Acer glabrum, Linnaea borealis, Menziesia ferruginea, Physocarpus malvaceus, Spiraea betulifolia, Symphoricarpos occidentalis, and Vaccinium membranaceum. Herbaceous layers may be graminoid- or forb-dominated and may include Bromus vulgaris, Calamagrostis rubescens, Carex geyeri, Clintonia uniflora, Coptis occidentalis, Cornus canadensis, Linnaea borealis, and Trautvetteria caroliniensis.. It occurs on foothills, mountainsides, and canyon walls. These soils have developed in highly mixed Mazama tephra deposits over colluvium and residuum from metasedimentary rock. The soils are very deep and have adequate available water capacity to a depth of 40 inches. The soils are well drained. This ES group fits into the National Vegetation Standard's Grand Fir - Douglas-fir Central Rocky Mountain Forest & Woodland Alliance and Washington State's Natural Heritage Program's Northern Rocky Mt. Mesic Montane Mixed Conifer Forest.

Table 1. Dominant plant species

Tree	(1) *Abies grandis* (2) *Pseudotsuga menziesii var. glauca*

Shrub	(1) *Rosa gymnocarpa* (2) *Linnaea borealis ssp. longiflora*
Herbaceous	(1) *Clintonia uniflora* (2) *Coptis occidentalis*

Physiographic features

Physiographic Features
Landscapes: Foothills, Mountains
Landform: hillslopes, mountain slopes

Elevation (m): Total range = 650 to 1275 m
(2,130 to 4,180 feet)
Central tendency = 850 to 1020 m
(2,790 to 3,345 feet)

Slope (percent): Total range = 0 to 85 percent
Central tendency = 20 to 45 percent

Aspect: Total range: 50-205-355
Central tendency: 125-205-280

Table 2. Representative physiographic features

Climatic features

Climatic Features
Frost-free period (days): Total range = 90 to 125 days
Central tendency = 105 to 115 days

Mean annual precipitation (cm): Total range = 670 to 1270 mm
(26 to 50 inches)
Central tendency = 820 to 1000mm
(32 to 39 inches)

MAAT (C): Total range = 5.6 to 8.8
(42 to 48 F)
Central tendency =6.7 to 7.6
(44 to 46 F)

Climate Stations: Kellog 1 W, Murray

Influencing water features

Water Table Depth:
>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 two soil series (e.g. Tigley, and Bechtel). The soil components are Vitrandic Hapludalfs. These soils have developed in highly mixed Mazama tephra deposits over colluvium and residuum from metasedimentary rock. The soils are very deep and have adequate available water capacity to a depth of 40 inches. The soils are well drained.

Table 3. Representative soil features

Parent material	(1) Volcanic ash (2) Colluvium – metasedimentary rock (3) Residuum – metasedimentary rock
Surface texture	(1) Ashy silt loam (2) Gravelly, ashy silt loam
Drainage class	Well drained
Permeability class	Moderately slow
Depth to restrictive layer	200 cm
Surface fragment cover >3"	Not specified
Available water capacity (0-101.6cm)	14.48 cm
Calcium carbonate equivalent (0-152.4cm)	Not specified
Electrical conductivity (0-152.4cm)	Not specified
Soil reaction (1:1 water) (0-152.4cm)	10
Subsurface fragment volume <=3" (25.4-152.4cm)	30 %

Subsurface fragment volume >3" (25.4-152.4cm)	Not specified

Table 4. Representative soil features (actual values)

Drainage class	Well drained
Permeability class	Moderate
Depth to restrictive layer	100 – 200 cm
Surface fragment cover >3"	0 %
Available water capacity (0-101.6cm)	9.91 – 16.76 cm
Calcium carbonate equivalent (0-152.4cm)	0 %
Electrical conductivity (0-152.4cm)	0 mmhos/cm
Soil reaction (1:1 water) (0-152.4cm)	4.5 – 7.3
Subsurface fragment volume <=3" (25.4-152.4cm)	0 – 80 %
Subsurface fragment volume >3" (25.4-152.4cm)	0 – 40 %

Ecological dynamics

Ecological Dynamics of the Site

This grand fir site is on the moister end of the grand fir series and can have many tree species occurring depending on disturbance and seed source. Douglas-fir is the main seral species and will occur in mature stands with grand fir with fire exclusion. Engelmann spruce can also be present in fire excluded mature stands. With stand replacing or mixed severity disturbance Douglas-fir, western larch, ponderosa pine, western white pine, and lodgepole pine can occur in mixed stands. Quaking aspen, paper birch, and black cottonwood can be present in early to mid-seral stands.

Key understory species include Douglas maple, ninebark, oceanspray, serviceberry, snowberry, twinflower, honeysuckle, Oregon grape, rose, thimbleberry, pachistima, Scouler willow, spirea, pinegrass, brides bonnet, pathfinder, sweetroot, starry solomonplume, western princes pine, and white hawkweed.

Root rot and beetle kill will occur in the mature grand fir – Douglas fir stands. Western white pine once would have been more prevalent in the seral to mature stands, however, blister rust has made it a minor component of current stands. Low intensity frequent fires will favor more open western larch, Douglas-fir, and ponderosa pine stands. Mixed severity fires will create a mosaic of mixed stands of all tree species. Severe fires may create ceanothus brush fields with tree regeneration slow to reclaim the site.

State and transition model

Additional community tables

Table 5. Community 1.1 plant community composition

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

Table 6. Community 1.2 plant community composition

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

Table 7. Community 1.3 plant community composition

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

Table 8. Community 1.4 plant community composition

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

Table 9. Community 2.1 plant community composition

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

Table 10. Community 3.1 plant community composition

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

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.

Finklin, A.I. 1983. Climate of Priest River Experimental Forest, northern Idaho. Gen. Tech. Rep. INT-159. U.S. Department of Agriculture, Forest Service, Intermountain Forest and Range Experiment Station, Ogden, UT. 53.

Smith and Fischer. 1997. Fire Ecology of the Forest Habitat Types of Northern Idaho.

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, 4/11/2025

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):**

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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:**