Ecological site F043AY552ID
Ashy Hills and Mountains
24-30" PZ Frigid
Western Bitterroot Foothills

Last updated: 3/11/2025
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

Most commonly found in LRU 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) – A3362 Abies grandis – Pseudotsuga menziesii Central Rocky Mountain Forest & Woodland Alliance Washington Natural Heritage Program. Ecosystems of Washington State, A Guide to Identification, Rocchio and Crawford, 2015 – Northern Rocky Mountain 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 – 15x Okanogan Highland Dry Forest, 15y Selkirk Mountains, 15v Northern Idaho Hills and Low Relief Mountains. This ecological site includes the following USDA Forest Service Plant Association: ABRG/PHMA, (Williams et. al. 1995)

Ecological site concept

This ESD is distinguished by an overstory of grand fir and Douglas-fir and an understory shrub component of ninebark, oceanspray, snowberry and /or twinflower. It occurs on mountainsides. The soils have developed in Mazama tephra deposits residuum and colluvium from granitic and metamorphic rock. They have a thick (>7 inches) mantle of volcanic ash material. The soils range from moderately deep to very deep and have adequate available water capacity to a depth of 40 inches. They are mostly well-drained and do not have a water table within 30 inches of the surface at any time during the year.. This ESD 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) *Pseudotsuga menziesii var. glauca* (2) *Abies grandis*
Shrub	(1) *Physocarpus malvaceus* (2) *Symphoricarpos albus*

Herbaceous	(1) *Galium trifidum* (2) *Bromus vulgaris*

Physiographic features

Physiographic Features
Landscapes: Mountains
Landform: mountain slopes

Elevation (m): Total range = 575 to 1360 m
(1,885 to 4,410 feet)
Central tendency = 750 to 995 m
(2,460 to 3,265 feet)

Slope (percent): Total range = 0 to 70 percent
Central tendency = 15 to 40 percent

Aspect:
Total range: 85-245-360
Central tendency: 205-245-290

Table 2. Representative physiographic features

Landforms	(1) Mountains > Mountain slope
Flooding frequency	None
Ponding frequency	None
Elevation	750 – 1,000 m
Slope	20 – 40 %
Water table depth	200 cm
Aspect	W, NW, SW

Table 3. Representative physiographic features (actual ranges)

Flooding frequency	None
Ponding frequency	None
Elevation	580 – 1,340 m
Slope	0 – 70 %

Water table depth	200 cm

Climatic features

Climatic Features
Frost-free period (days): Total range = 90 to 130 days
Central tendency = 105 to 115 days

Mean annual precipitation (cm): Total range = 490 to 1145 mm
(19 to 45 inches)
Central tendency = 685 to 905 mm
(27 to 36 inches)

MAAT (C): Total range = 5.7 to 8.9
(42 to 48 F)
Central tendency = 6.8 to 7.7
(44 to 46 F)

Climate Stations: none

Influencing water features

Water Table Depth: >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. Kellerbutte, Neva, and Moscow). The soil components are: Typic Vitrixerands, Andic Haploxeralfs, and Andic Dystroxerepts. These soils have developed in Mazama tephra deposits residuum and colluvium from granitic and metamorphic rock. The tephra layers are important for forest productivity in that they retain large amounts of water compared to other parent materials, have high cation exchange capacity and high availability of organically bound plant nutrients. 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.

Table 4. Representative soil features

Parent material	(1) Volcanic ash (2) Colluvium – granite (3) Colluvium – metamorphic rock (4) Residuum – granite (5) Residuum – metamorphic rock
Surface texture	(1) Ashy silt loam (2) Ashy loam

Drainage class	Well drained
Permeability class	Moderate
Depth to restrictive layer	200 cm
Surface fragment cover >3"	Not specified
Available water capacity (0-101.6cm)	11.68 cm
Calcium carbonate equivalent (0-152.4cm)	Not specified
Electrical conductivity (0-152.4cm)	Not specified
Soil reaction (1:1 water) (0-152.4cm)	6.1
Subsurface fragment volume <=3" (25.4-152.4cm)	20 %
Subsurface fragment volume >3" (25.4-152.4cm)	Not specified

Table 5. Representative soil features (actual values)

Drainage class	Well drained
Permeability class	Moderate
Depth to restrictive layer	50 – 200 cm
Surface fragment cover >3"	0 %

Available water capacity (0-101.6cm)	11.43 – 20.57 cm
Calcium carbonate equivalent (0-152.4cm)	0 %
Electrical conductivity (0-152.4cm)	0 mmhos/cm
Soil reaction (1:1 water) (0-152.4cm)	5.1 – 7.3
Subsurface fragment volume <=3" (25.4-152.4cm)	0 – 40 %
Subsurface fragment volume >3" (25.4-152.4cm)	0 – 40 %

Ecological dynamics

Ecological Dynamics of the Site
This site is the warmest extent where grand fir can be an overstory component. As the temperature gradient gets warmer Douglas-fir and ponderosa pine habitat types occur. Above this temperature gradient (cooler) subalpine fir habitats exist. Relative to moisture this is the driest grand fir habitat type. As moister increases grand fir/herb, cedar, and cedar-hemlock habitat types occur. Fire disturbance is a major factor in mature stand development. Frequent fires create an open stand of western larch, ponderosa pine, and Douglas-fir with a mixed understory of shrubs, grass, and herbs. Mixed severity fires create a patchy forest overstory with shrubs and grass understory. Fire exclusion allows grand fir to establish and become an overstory component with Douglas-fir. Stands in this condition are subject to stand replacing fires. Root rot can become a problem in these older stands dominated by Douglas-fir and grand fir.
The moister end of this ES lies in Northern Idaho where grand fir is more prominent in stand composition and western larch can be a major stand component. As this ES extends westward into Washington, grand fir is near its ecological limit and is a minor stand component. Douglas-fir and ponderosa pine are the major tree species. In this warmer environment this ES looks very similar to the Douglas-fir/ninebark ES

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 (%)

Table 7. Community 1.2 plant community composition

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

Table 8. Community 1.3 plant community composition

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

Table 9. Community 1.4 plant community composition

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

Table 10. Community 2.1 plant community composition

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

Table 11. Community 3.1 plant community composition

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

Table 12. Community 4.1 plant community composition

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

Table 13. Representative site productivity

Common Name	Symbol	Site Index Low	Site Index High	CMAI Low	CMAI High	Age Of CMAI	Site Index Curve Code	Site Index Curve Basis	Citation
Rocky Mountain Douglas-fir	*PSMEG*	75	110	71	160	90	–	–	
Rocky Mountain Douglas-fir	*PSMEG*	64	107	65	158	90	–	–	
ponderosa pine	*PIPO*	98	120	99	141	40	–	–	
grand fir	*ABGR*	70	85	95	124	110	–	–	
western larch	*LAOC*	66	85	66	103	50	–	–	
western larch	*LAOC*	50	70	63	70	70	–	–	

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.

Daubenmire, R. and J. Daubenmire. 1968. Forest Vegetation of Eastern Washington and Northern Idaho.

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, 3/11/2025

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):**

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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:**
