Ecological site F043AY557ID
Ashy Till Mountains and Valleys
30-45" PZ Frigid
Bitterroot Metasedimentary Zone

Last updated: 4/10/2025
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 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), A3612 Western Hemlock – Western Redcedar Cool-Mesic Central Rocky Mountain Forest & 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 (Cedar-Hemlock) 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 – 15y Selkirk Mountains, 15w Western Selkirk Maritime Forest. This ecological site includes the following USDA Forest Service Plant Associations Western Hemlock Series: TSHE/CLUN, TSHE/ASCA. (Williams et. al. 1995)

Ecological site concept

This ecological site is the most productive in terms of forest production and biodiversity. It can be highly dynamic in forest succession depending on seed source, degree of disturbance, and shrub completion. Western larch has taken over the role of early successor since the western white pine blister rust epidemic. A whole range of tree species can be found through forest succession. Eventually, without major disturbance stands of Douglas-fir, larch, grand fir and white pine are overtaken by western hemlock and western redcedar. These cedar-hemlock stands will perpetuate until a major stand replacing fire occurs. The soils have developed in moderately thick (7-14 inch) Mazama tephra deposits over alluvium or local till from mixed sources. The soils are very deep and have low available water capacity to a depth of 40 inches. The soils are well drained and do not have a water table within 30 inches of the surface at any time throughout the year.

Table 1. Dominant plant species

Tree	(1) *Tsuga heterophylla* (2) *Thuja plicata*
Shrub	(1) *Lonicera utahensis* (2) *Rosa gymnocarpa*

Herbaceous	(1) *Clintonia uniflora* (2) *Asarum caudatum*

Physiographic features

Physiographic Features
Landscapes: Mountains, Valleys
Landform: mountain slopes, valley sides

Elevation (m): Total range = 550 to 1775 m
(1,805 to 5,820 feet)
Central tendency = 975 to 1345m
(3,200 to 4,410 feet)

Slope (percent): Total range = 0 to 105 percent
Central tendency = 25 to 60 percent

Aspect: Total range: 240-15-160
Central tendency: 300-15-60

Table 2. Representative physiographic features

Landforms	(1) Mountains > Mountain slope (2) Valley > Valley side
Flooding frequency	None
Ponding frequency	None
Elevation	980 – 1,340 m
Slope	30 – 60 %
Water table depth	200 cm
Aspect	NW, N, NE, E

Table 3. Representative physiographic features (actual ranges)

Flooding frequency	None
Ponding frequency	None
Elevation	550 – 1,770 m
Slope	0 – 100 %

Water table depth	200 cm

Climatic features

Climatic Features
Frost-free period (days): Total range = 80 to 125 days
Central tendency = 95 to 105 days

Mean annual precipitation (cm): Total range = 600 to 2315 mm
(24 to 64 inches)
Central tendency = 765 to 1385 mm
(30 to 55 inches)

MAAT (C): Total range = 2.9 to 8.1
(37 to 47 F)
Central tendency = 5.0 to 6.3
(41 to 43 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 the Pearsoncreek family soil component. These soils are Andic Dystrudepts. They have developed in moderately thick (7-14 inches) Mazama tephra deposits over alluvium or local till from mixed sources. The soils are very deep and have low available water capacity to a depth of 40 inches. The soils are well drained.

Table 4. Representative soil features

Parent material	(1) Volcanic ash (2) Alluvium (3) Till
Surface texture	(1) Gravelly, ashy silt 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)	5.59 cm
Calcium carbonate equivalent (0-152.4cm)	Not specified
Electrical conductivity (0-152.4cm)	Not specified
Soil reaction (1:1 water) (0-152.4cm)	5.8
Subsurface fragment volume <=3" (25.4-152.4cm)	60 %
Subsurface fragment volume >3" (25.4-152.4cm)	20 %

Table 5. Representative soil features (actual values)

Drainage class	Well drained
Permeability class	Moderate
Depth to restrictive layer	200 cm
Surface fragment cover >3"	0 %
Available water capacity (0-101.6cm)	5.59 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 – 6.5
Subsurface fragment volume <=3" (25.4-152.4cm)	20 – 70 %
Subsurface fragment volume >3" (25.4-152.4cm)	0 – 70 %

Ecological dynamics

Ecological Dynamics of the Site
This site occurs most commonly on north slopes, cool benches, and dissected drainages in Northern Idaho and NE Washington. The depth of volcanic ash in the soil along with high precipitation makes this site highly productive. It is recognized by USFS Forest Habitat Types of Northern Idaho as the Western hemlock / Queenscup beadlily and Western hemlock / Wild Ginger habitat types. The WH/beadlilly habitat type is the most prolific and occurs on all aspects. The wild ginger type occurs on moister landscapes, usually on toe slopes or drainage areas. The cooler portions of this site occur at higher elevation lack western redcedar and have rusty menziesia as key shrub indicator.
This site has the highest ecological dynamics depending on type and degree of disturbance, and tree species seed source. Western hemlock and western redcedar will eventually dominate the overstory without major fire disturbance. Grand fir, Douglas-fir, western white pine, and western larch could be present in varying amounts. Understory reproduction and 2nd level overstory will be dominated by western hemlock and western redcedar due to their high degree of shade tolerance. There will be a large component of downed wood caused by windthrow, seral species die-out, and insect and disease mortality. Paper birch is a key deciduous tree species in this hemlock-cedar ecological site. It can be a prominent understory component in early to mature stands and eventually dies out in the late climax forest.
Fire frequency in these stands occurs in long intervals of 150+ years. Due to the large volume of wood, stand replacing fires were the norm leaving the site naturally reforested by western white pine. After the white pine blister rust epidemic western larch, Douglas-fir, and in drier areas ponderosa pine gets established depending on seed source and competing shrub species. Grand fir, western hemlock, and western redcedar will also reestablish on the site through time. Lodgepole pine can be present and prevalent on sites after fire.
Ceanothus, alder species, and Douglas maple can reestablish quickly on these burnt sites slowing down natural reforestation. Reoccurring severe fires causing soil degradation can keep the site in a shrub dominated condition for long periods. Western larch is not as hardy as western white pine in competing with the brush species through natural regeneration. Larch needs to immediately establish on bare soil without much competition. The loss of the dominant white pine component again has caused a higher occurrence of Douglas-fir, grand fir, western hemlock, and western redcedar in developing stands.
The understory vegetation can be very rich in areas receiving enough sunlight. Key species include Queenscup beadlily, hooker fairybells, starry Solomon seal, wintergreen, huckleberry spp., and sword fern.

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 (%)

Wood products

sawtimber, pulp, cedar shakes and posts

Other products

Mushrooms, cedar boughs

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
western white pine	*PIMO3*	60	93	118	180	100	–	–	
grand fir	*ABGR*	60	98	76	149	100	–	–	
western larch	*LAOC*	56	85	74	132	70	–	–	
Rocky Mountain Douglas-fir	*PSMEG*	72	85	83	116	110	–	–	
Rocky Mountain Douglas-fir	*PSMEG*	66	100	71	97	90	–	–	

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Approval

Kirt Walstad, 4/10/2025

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:**

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4. **Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):**

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5. **Number of gullies and erosion associated with gullies:**

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6. **Extent of wind scoured, blowouts and/or depositional areas:**

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7. **Amount of litter movement (describe size and distance expected to travel):**

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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):**

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:**