Ecological site F043AY568ID
Ashy Fragipan Hills
30-45" PZ Frigid
Eastern Columbia Plateau Embayments

Last updated: 10/14/2020
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 43A07 (Eastern Columbia Plateau Embayments). Also found in 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), 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 Redcedar Series: THPL/CLUN, THPL/ASCA. (Williams et. al. 1995)

Ecological site concept

This ES group is distinguished by an overstory of western redcedar, grand fir and Douglas-fir and a diverse understory of shrubs such as woods rose and Utah honeysuckle; and herbs such as bride’s bonnet, Idaho goldthread and starry false solomon’s seal. It occurs on foothills, mountainsides, and ridges. These soils have developed in thick (>7 inches) Mazama tephra deposits over sediments and colluvium from metamorphic rock. The soils are shallow, moderately deep or deep to a fragipan and have adequate available water capacity to a depth of 40 inches. The soils are somewhat poorly drained, moderately well drained or well drained. Perched water tables can occur at 4 to 28 inches depth from Dec to Apr. The soils are dry otherwise. This ES group fits into the National Vegetation Standard’s Tsuga heterophylla - Thuja plicata Cool-Mesic Central Rocky Mountain Forest & Woodland Alliance and Washington State’s Natural Heritage Program’s Northern Rocky Mountain Mesic Montane Mixed Conifer Forest.

Table 1. Dominant plant species

Tree	(1) *Thuja plicata* (2) *Abies grandis*

Shrub	(1) *Vaccinium membranaceum* (2) *Linnaea borealis ssp. longiflora*
Herbaceous	(1) *Clintonia uniflora* (2) *Asarum caudatum*

Physiographic features

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

Elevation (m): Total range = 670 to 1220 m
(2,195 to 4,000 feet)
Central tendency = 875 to 1015 m
(2,220 to 3,330 feet)

Slope (percent): Total range = 0 to 45 percent
Central tendency = 7 to 20 percent

Aspect: none dominant

Table 2. Representative physiographic features

Landforms	(1) Foothills > Hillslope (2) Plateau > Hillslope (3) Mountain range > Mountain slope
Flooding frequency	None
Ponding frequency	None
Elevation	680 – 1,020 m
Slope	10 – 20 %
Water table depth	200 cm
Aspect	Aspect is not a significant factor

Table 3. Representative physiographic features (actual ranges)

Flooding frequency	None
Ponding frequency	None

Elevation	670 – 1,220 m
Slope	0 – 50 %
Water table depth	10 – 200 cm

Climatic features

Climatic Features
Frost-free period (days): Total range = 80 to 135 days
Central tendency = 90 to 110 days

Mean annual precipitation (cm): Total range = 645 to 1210 mm
(25 to 48 inches)
Central tendency = 830 to 985 mm
(33 to 39 inches)

MAAT (C): Total range = 6.1 to 9.5
(43 to 49 F)
Central tendency = 7.2 to 8.1
(45 to 47 F)

Climate Stations: none

Influencing water features

Water Table Depth: perched water tables at 4 to 28 inches (median = 20 inches) during Dec to Apr
Water tables absent during May-Nov

Flooding:
Frequency: None
Duration: None

Ponding:
Frequency: None
Duration: None

Soil features

Representative Soil Features

This ecological site is associated with several soil series (e.g Kauder, Mission, Threebear and Tomodo). The soils are Andic Fragiudalfs, Alfic Udivitrands, and Oxyaquic Udivitrands. These soils have developed in thick (>7 inches) Mazama tephra deposits over sediments and colluvium from metamorphic rock. The soils are shallow to deep to a fragipan and have adequate available water capacity to a depth of 40 inches. The soils are moderately well drained or well drained. Perched water tables can occur at 4 to 28 inches depth from Dec to Apr. The soils are dry otherwise.
Permeability Class: Very Slow to Slow in fragipan; Moderate to Moderately Slow above

Table 4. Representative soil features

Parent material	(1) Volcanic ash (2) Alluvium (3) Colluvium – metamorphic rock

Surface texture	(1) Ashy silt loam (2) Medial silt loam
Drainage class	Moderately well drained
Permeability class	Slow
Depth to restrictive layer	80 cm
Soil depth	200 cm
Surface fragment cover >3"	Not specified
Available water capacity (0-101.6cm)	20.07 cm
Calcium carbonate equivalent (0-152.4cm)	Not specified
Electrical conductivity (0-152.4cm)	Not specified
Soil reaction (1:1 water) (0-152.4cm)	5.9
Subsurface fragment volume <=3" (25.4-152.4cm)	Not specified
Subsurface fragment volume >3" (25.4-152.4cm)	Not specified

Table 5. Representative soil features (actual values)

Drainage class	Moderately well drained to well drained
Permeability class	Very slow to moderate

Depth to restrictive layer	30 – 150 cm
Soil depth	200 cm
Surface fragment cover >3"	0 %
Available water capacity (0-101.6cm)	18.29 – 25.91 cm
Calcium carbonate equivalent (0-152.4cm)	0 %
Electrical conductivity (0-152.4cm)	0 mmhos/cm
Soil reaction (1:1 water) (0-152.4cm)	0 – 7.3
Subsurface fragment volume <=3" (25.4-152.4cm)	0 – 10 %
Subsurface fragment volume >3" (25.4-152.4cm)	0 %

Ecological dynamics

Ecological Dynamics of the Site

This ecological site is highly diverse in tree species, shrub and forb composition. Forest composition is dependent of fire severity, occurrence, and tree species seed source after fire. Western white pine used to dominate stands after stand replacing fires before the white pine blister rust. Now, western larch, Douglas-fir, lodgepole, and ponderosa pine (dry exposures) have replaced it. Grand fir and western red cedar also get established but sit in understory underneath the other species until release from canopy openings. In early stands after fire Quaking aspen, paper birch, and black cottonwood will be present only to be overtopped in later years. Shrub competition can be severe after fire with many shrub species dominating the site. Red stem ceanothus or snowbrush ceanothus (drier areas) could dominate sites with severe burns. Mixed severity fires create a patchy mosaic of all tree species being present. Reference condition will have fire exclusion or fire intervals of over 150 years which produce an all-aged western red cedar – grand fir forest. Relic western larch, Douglas-fir, and ponderosa pine may be present.

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. 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*	75	110	144	201	100	–	–	
grand fir	*ABGR*	76	124	106	201	95	–	–	
Rocky Mountain Douglas-fir	*PSMEG*	64	98	65	152	104	–	–	
western larch	*LAOC*	56	93	74	146	70	–	–	
Rocky Mountain Douglas-fir	*PSMEG*	66	100	56	130	88	–	–	

References

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Approval

Curtis Talbot, 10/14/2020

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	11/10/2026
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:**