Ecological site F043AY527WA
Warm-Frigid, Udic, Loamy Foothills/Valleys, high water table (western redcedar, moist herb)
Thuja plicata / Clintonia uniflora

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 43A02 (Western Selkirk Mountains). Also found in areas of 43A01, 43A03, 43A04. 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. (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. Soils are loamy with volcanic ash influenced surfaces, water table at 30 inches depth and moderate to high available water holding capacity. 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) *Paxistima myrsinites* (2) *Linnaea borealis ssp. longiflora*

Herbaceous	(1) *Clintonia uniflora* (2) *Viola orbiculata*

Physiographic features

Physiographic Features
Landscapes: Foothills, Valleys
Landform: stream terraces, lacustrine terraces, mountain slopes
Geomorphons: toe slopes, side slopes, foot slopes

Elevation (m): Total range = 450 to 955 m
(1,475 to 3,130 feet)
Central tendency = 610 to 750 m
(2,000 to 2,460 feet)

Slope (percent): Total range = 0 to 45 percent
Central tendency = 2 to 20 percent

Water Table Depth (cm):
30 cm to 40 cm (median = >31cm)
(12 to 16 inches; median = 12 inches)

Flooding:
Frequency: None to Occasional
Duration: None to Brief

Ponding:
Frequency: None
Duration: None

Aspect: (central tendency)
65-135-205

Table 2. Representative physiographic features

Landforms	(1) Valley > Outwash terrace (2) Foothills > Hillslope (3) Valley > Lake terrace
Flooding duration	Not specified
Flooding frequency	None
Ponding frequency	None
Elevation	610 – 750 m
Slope	0 – 20 %
Aspect	E, SE, S, SW

Table 3. Representative physiographic features (actual ranges)

Flooding duration	Brief (2 to 7 days)
Flooding frequency	None to occasional
Ponding frequency	None
Elevation	450 – 950 m
Slope	0 – 50 %

Climatic features

Climatic Features
Frost-free period (days): Total range = 95 to 135 days
Central tendency = 110 to 120 days

Mean annual precipitation (cm): Total range = 460 to 810 mm
(18 to 32 inches)
Central tendency = 535 to 710 mm
(21 to 28 inches)

MAAT (C): Total range = 6.3 to 9.3
(43 to 49 F)
Central tendency = 7.3 to 8.1
(45 to 47 F)

Climate Stations: none

Influencing water features

Water Table Depth (cm):
30 cm to 40 cm (median = >31cm)
(12 to 16 inches; median = 12 inches)

Soil features

Representative Soil Features

This ecological subsite is associated with several soil series (e.g Aquic Xerofluvents, Glaciercreek, Mission). The soil components can be grouped into: Andic Eutrudepts, Aquic Xerofluvents, Ochreptic Fragixeralfs. These soils have developed in thin to mixed Mazama tephra deposits over till, glaciolacustrine, outwash and residuum and colluvium from granitic and metamorphic rock. The soils range from deep to very deep and have adequate available water capacity to a depth of 1 m. The soils are moderately well to somewhat poorly drained.

Parent Materials:
Kind: Tephra (volcanic ash)
Origin: mixed
Kind: alluvium, glaciolacustrine and outwash material
Origin: Mixed

Surface Texture: (2mm fraction)
(1) Ashy-Silt Loam

Fragment content of surface: 0 to 10 percent (median = 0%)

Subsurface Texture Group: Loamy
Fragment content of subsurface (25 to 100cm or restriction): 0 to 35 percent (median = 0%)
Most components lack surface fragments
Drainage Class: Moderately Well drained to Somewhat Poorly drained
Saturated Hydraulic conductivity: Moderately high to High (above restrictions)
Soil Depth: 90% of components have a restriction within 150 cm
Densic contacts when present are at 25 to 50cm (median = 45 cm)
Fragipans when present are at 25 to 50cm (median = 30)
Calcium Carbonate Equivalent (percent): 0 to 5 (median = 0)
Soil Reaction (1:1 Water): 5.1 to 7.8

Table 4. Representative soil features

Parent material	(1) Volcanic ash (2) Alluvium (3) Glaciolacustrine deposits (4) Outwash
Surface texture	(1) Ashy silt loam
Drainage class	Well drained
Permeability class	Moderate
Depth to restrictive layer	Not specified
Available water capacity (0-101.6cm)	15.24 cm
Calcium carbonate equivalent (0-101.6cm)	Not specified
Soil reaction (1:1 water) (0-152.4cm)	Not specified
Subsurface fragment volume <=3" (25.4-101.6cm)	Not specified

Table 5. Representative soil features (actual values)

Drainage class	Well drained

Permeability class	Moderate to rapid
Depth to restrictive layer	30 – 0 cm
Available water capacity (0-101.6cm)	7.62 – 15.24 cm
Calcium carbonate equivalent (0-101.6cm)	0 %
Soil reaction (1:1 water) (0-152.4cm)	5.1 – 7.8
Subsurface fragment volume <=3" (25.4-101.6cm)	0 – 40 %

Ecological dynamics

A description of vegetation dynamics and a state and transition model can be found in Ecological Site Group EX043AESG08

State and transition model

Figure 1. Ecological Site Frigid Udic Loamy Foothills/Mountainsides (Western redcedar, moist herb)

Additional community tables

Wood products

Forest Site Productivity Species Average Site Index Culmination of Mean Annual Increment SI Reference Grand fir 79 140 031 (Cochran, 50 yr BH) Western Larch 53 69 265 (Schmidt, 50 yr TA) Lodgepole Pine 105 100 520 (Alexander, 100 TA) Western White Pine 81 152 570 (Haig, 50 yr TA) Ponderosa Pine 104 114 600 (Meyer, 100 yr TA) Douglas-fir 89 93 031 (Cochran, 50 yr BH) Douglas-fir 75 92 771 (Monserud, 50 yr BH)

References

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

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

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

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

. October, 1995. Idaho Department of Lands H.T. Groupings based on Forest HTs of Northern Idaho.

Miller and Gravelle. October, 2005. Species Selection Guidelines for Planting, Natural Regeneration and Crop Tree Selection on Potlatch Land in Northern Idaho, Forestry Technical Paper TP -2003-1.

McDonald, G.L., A.E. Harvey, and J.R. Tonn. 2000. Fire, Competition, and Forest Pests: Landscape Treatment to Sustain Ecosystem Functions, The Joint Fire Science Conference and Workshop.. Pages 195–211 in Proceedings from the Joint Fire Science Conference and Workshop: crossing the millennium: integrating spatial technologies and ecological principles for a new age in fire management.

Zack, A. 1994. Early Succession in Western Hemlock Habitat Types of Northern Idaho.

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):**

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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):**

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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:**