

**Ecological site F043AY530WA**  
**Warm-Frigid, Dry-Udic, Sandy Outwash Terraces, mixed ash surface**  
**(Grand Fir Moist Herb)**  
***Abies grandis*/*Clintonia uniflora***

Last updated: 10/14/2020

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

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**LRU notes**

Most commonly found in LRU 43A04 (Selkirk Mountains). Also found in adjacent areas of 44A02. 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), Grand Fir – Douglas-fir 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 Grand Fir Series: ABGR/CLUN. (Williams et. al. 1995)

**Ecological site concept**

This ES 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 carolinensis*. It occurs on Sandy outwash terraces with 7 inches of volcanic ash on the surface, water table at >30 inches depth and low available water holding capacity. 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) <i>Abies grandis</i> (2) <i>Pseudotsuga menziesii</i> var. <i>glauca</i>
Shrub	(1) <i>Acer glabrum</i> (2) <i>Linnaea borealis</i> ssp. <i>longiflora</i>

Herbaceous	(1) <i>Clintonia uniflora</i> (2) <i>Coptis occidentalis</i>
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**Physiographic features**

Physiographic Features

Landscapes: Mountains, Foothills, Valleys

Landform: sideslopes, foot slopes, outwash terraces, escarpments

Elevation (m): Total range = 575 to 1565 m

(1,890 to 5,135 feet)

Central tendency = 990 to 1275 m

(3,245 to 4,180 feet)

Slope (percent): Total range = 0 to 55 percent

Central tendency = 15 to 30 percent

Water Table Depth (cm):

>200 cm

(>80 inches)

Flooding:

Frequency: None

Duration: None

Ponding:

Frequency: None

Duration: None

Aspect: (central tendency)

150-180-220

**Table 2. Representative physiographic features**

Landforms	(1) Mountains > Mountain slope (2) Foothills > Hillslope (3) Valley > Outwash terrace
Flooding frequency	None
Ponding frequency	None
Elevation	990 – 1,270 m
Slope	20 – 30 %
Aspect	SE, S, SW

**Table 3. Representative physiographic features (actual ranges)**

Flooding frequency	None
Ponding frequency	None
Elevation	580 – 1,570 m
Slope	0 – 60 %

### **Climatic features**

#### Climatic Features

Frost-free period (days): Total range = 85 to 120 days

Central tendency = 95 to 105 days

Mean annual precipitation (cm): Total range = 590 to 1245 mm

(23 to 49 inches)

Central tendency = 810 to 985 mm

(32 to 39 inches)

MAAT (C): Total range = 3.9 to 8.0

(39 to 46 F)

Central tendency = 5.2 to 6.7

(41 to 44 F)

Climate Stations: none

### **Influencing water features**

#### **Soil features**

##### Representative Soil Features

This ecological subsite is associated with several soil series (e.g. Snowlake). The soil components are Vitrandic Dystrudepts. These soils have developed in mixed Mazama tephra deposits over outwash.. The soils are very deep and have low available water capacity to a depth of 1 m. The soils are well drained.

##### Parent Materials:

Kind: Tephra (volcanic ash)

Origin: mixed

Kind: outwash material

Origin: Granite, Metamorphic rock

Surface Texture: (2mm fraction)

(1) Ashy-Sandy Loam

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

Subsurface Texture Group: Sandy

Fragment content of subsurface (25 to 100cm): 0 to 20 percent (median = 5%)

Most components lack surface fragments

Drainage Class: Well to Somewhat excessively drained

Saturated Hydraulic conductivity: High to Very High

Soil Depth: components have no restriction within 150 cm

Calcium Carbonate Equivalent (percent): 0

Soil Reaction (1:1 Water): 5.6 to 7.3 (median = 6.5)

Available Water Capacity (total in 100cm): 6.73cm

**Table 4. Representative soil features**

Parent material	(1) Volcanic ash (2) Outwash – granite and gneiss
Surface texture	(1) Ashy sandy loam
Drainage class	Somewhat excessively drained
Permeability class	Rapid
Available water capacity (0-101.6cm)	6.6 cm
Calcium carbonate equivalent (0-101.6cm)	Not specified
Soil reaction (1:1 water) (0-152.4cm)	6.5
Subsurface fragment volume $\leq 3"$ (25.4-101.6cm)	10 %

**Table 5. Representative soil features (actual values)**

Drainage class	Well drained to somewhat excessively drained
Permeability class	Moderately rapid to very rapid
Available water capacity (0-101.6cm)	5.08 – 7.62 cm
Calcium carbonate equivalent (0-101.6cm)	0 %

Soil reaction (1:1 water) (0-152.4cm)	5.6 – 7.3
Subsurface fragment volume <=3" (25.4-101.6cm)	0 – 30 %

### Ecological dynamics

A description of vegetation dynamics and a state and transition model can be found in Ecological Site Group EX043AESG07

### State and transition model

Figure 1. Ecological Site Frigid Udic Loamy Foothills/Mountainsides (Grand Fir Moist Herb)

### Additional community tables

#### Wood products

Forest Site Productivity Species Average Site Index Culmination Mean Annual Increment (CMAI) SI Reference Grand fir 80 114 035 (Cochran, 50 yr BH) Western Larch 60 81 265 (Schmidt, 50 yr TA) Western White Pine 60 118 570 (Haig, 50 yr TA) Ponderosa Pine 108 118 600 (Meyer, 100 yr TA) Douglas-fir 76 74 031 (Cochran, 50 yr BH) Douglas-fir 60 56 771 (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.

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

. 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.

### 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	04/21/2026
Approved by	
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

## Indicators

**1. Number and extent of rills:**

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**2. Presence of water flow patterns:**

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**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):

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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:

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