Ecological site F043AY529WA
Warm-Frigid, Dry-Udic, Loamy Foothills/Mountainsides, ashy surface (Grand Fir Moist Herb) Abies grandis/Clintonia uniflora

Last updated: 10/14/2020
Accessed: 05/19/2024

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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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 43A04 (Selkirk Mountains). Also found in adjacent areas of 43A03, 44A01 and 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 caroliniensis. It occurs on loamy foothills and mountainsides with >7 inches of volcanic ash on the surface, water table at >30 inches depth and moderate to high 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) *Abies grandis* (2) *Pseudotsuga menziesii var. glauca*
Shrub	(1) *Acer glabrum* (2) *Linnaea borealis ssp. longiflora*
Herbaceous	(1) *Clintonia uniflora* (2) *Coptis occidentalis*

Physiographic features

Physiographic Features
Landscapes: Mountains, Valleys
Landform: mountain slopes, hill slopes, outwash terraces

Elevation (m): Total range = 490 to 1915 m
(1,605 to 6,280 feet)
Central tendency = 855 to 1280 m
(2,805 to 4,200 feet)

Slope (percent): Total range = 0 to 95 percent
Central tendency = 15 to 50 percent

Water Table Depth (cm):
>200 cm
(>80 inches)

Flooding:
Frequency: None
Duration: None

Ponding:
Frequency: None
Duration: None

Aspect: (central tendency)
150-220-300

Table 2. Representative physiographic features

Landforms	(1) Mountains > Mountain slope (2) Foothills > Hillslope (3) Valley > Outwash terrace
Flooding frequency	None
Ponding frequency	None
Elevation	855–1,280 m

Slope	15–50%
Aspect	W, NW, SE, S, SW

Table 3. Representative physiographic features (actual ranges)

Flooding frequency	None
Ponding frequency	None
Elevation	489–1,914 m
Slope	0–95%

Climatic features

Climatic Features
Frost-free period (days): Total range = 85 to 135 days
Central tendency = 105 to 120 days

Mean annual precipitation (cm): Total range = 510 to 1320 mm
(20 to 52 inches)
Central tendency = 700 to 950 mm
(28 to 37 inches)

MAAT (C): Total range = 2.8 to 9.1
(37 to 48 F)
Central tendency = 5.2 to 6.8
(41 to 44 F)

Climate Stations: none

Influencing water features

Soil features

Representative Soil Features

This ecological subsite is associated with several soil components (e.g. Andic Dystrochrepts, Belzar, Bonnash, Bouldercreek, Boulderjud, Eloika, Highfalls, Honeyjones, Hugus, Jacot, and Pearsoncreek). The soil components can be grouped into: Alfic Udivitrands, Andic Dystrochrepts, Andic Dystrudepts, Andic Haploxerepts, Typic Udivitrands, and Typic Vitrixerands. These soils have developed in Mazama tephra deposits over till, outwash and residuum and colluvium from sedimentary or metasedimentary 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.

Parent Materials:
Kind: Tephra (volcanic ash)
Origin: mixed
Kind: till, residuum and colluvium, and outwash material
Origin: Granite, Metamorphic, sedimentary or metasedimentary rock

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

Fragment content of surface: 0 to 30 percent (median = 9%)

Subsurface Texture Group: Loamy
Fragment content of subsurface (25 to 100cm): 1 to 75 percent (median = 30%)
Most components lack surface fragments
Drainage Class: Well drained
Saturated Hydraulic conductivity: Moderately high to High
Soil Depth: 75% of components have no restriction within 150 cm
Lithic contacts when present are at 50 to 100cm (median = 96cm)
Calcium Carbonate Equivalent (percent): 0
Soil Reaction (1:1 Water): 5.1 to 8.4 (median = 6.5)
Available Water Capacity (total in 100cm): 9.02-15.49cm (median = 12.01 cm)

Table 4. Representative soil features

Parent material	(1) Volcanic ash (2) Till (3) Outwash (4) Residuum–granite and gneiss (5) Residuum–metasedimentary rock (6) Colluvium–granite and gneiss (7) Colluvium–metasedimentary rock
Surface texture	(1) Ashy silt loam (2) Ashy loam
Drainage class	Well drained
Permeability class	Moderate
Depth to restrictive layer	0 cm
Available water capacity (0-101.6cm)	11.94 cm
Calcium carbonate equivalent (0-101.6cm)	0%
Soil reaction (1:1 water) (0-152.4cm)	6.5
Subsurface fragment volume <=3" (25.4-101.6cm)	30%

Table 5. Representative soil features (actual values)

Drainage class	Well drained
Permeability class	Moderate to rapid
Depth to restrictive layer	51–0 cm
Available water capacity (0-101.6cm)	8.89–15.49 cm
Calcium carbonate equivalent (0-101.6cm)	0%
Soil reaction (1:1 water) (0-152.4cm)	5.1–8.4
Subsurface fragment volume <=3" (25.4-101.6cm)	1–75%

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

State and Transition Diagram

Ecological Site
Frigid Udic Loamy Foothills/Mountainsides (Grand Fir Moist Herb)
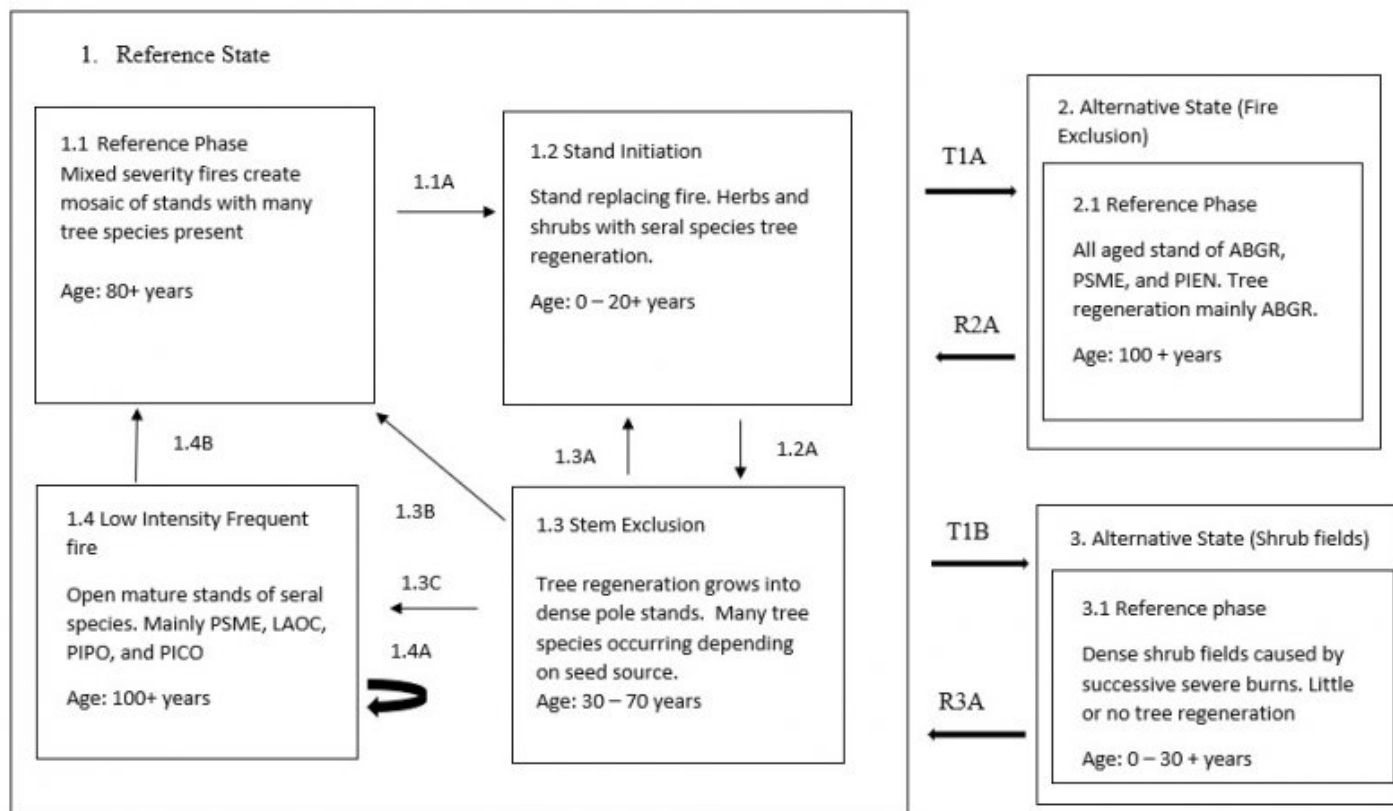Abies grandis/Clintonia uniflora (Grand Fir / Bride's Bonnet)

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

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

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

. 2017. Idaho Department of Lands H.T. Groupings based on Forest HTs of Northern Idaho.

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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.

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

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	05/19/2024
Approved by	Curtis Talbot
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):**

_____

10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:**

_____

11. **Presence and thickness of compaction layer (usually none; describe soil profile features which may be mistaken for compaction on this site):**

_____

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:

_____

13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):**

_____

14. **Average percent litter cover (%) and depth (in):**

_____

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:**