

Ecological site F044AY503WA

Warm-Frigid, Moist- Xeric Loamy Foothills/Mountainsides, high water table (Grand Fir Warm Dry Shrub) *Abies grandis* - *Pseudotsuga menziesii* / *Physocarpus malvaceus* - *Symphoricarpos albus*

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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): 044A–Northern Rocky Mountain Valleys

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 44A01 (Spokane-Rathdrum Outwash Plains). Also found in adjacent areas of 43A04 and 44A02.

Classification relationships

Relationship to Other Established Classifications:

United States National Vegetation Classification (2008) – A3362 *Abies grandis* – *Pseudotsuga menziesii* Central Rocky Mountain Forest & Woodland Alliance

Washington Natural Heritage Program. Ecosystems of Washington State, A Guide to Identification, Rocchio and Crawford, 2015 – Northern Rocky Mountain Mesic Montane Mixed Conifer Forest

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 – 15x Okanogan Highland Dry Forest, 15y Selkirk Mountains, 15v Northern Idaho Hills and Low Relief Mountains.

This ecological site includes the following USDA Forest Service Plant Association: ABRG/PHMA, (Williams et. al. 1995)

Ecological site concept

This ES group is distinguished by an overstory of grand fir and Douglas-fir and an understory shrub component of ninebark, oceanspray, snowberry and /or twinflower. It occurs on loamy foothills, and terraces that have a water table within 30 inches of the soil surface during the growing season. 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.

Associated sites

R044AY501WA	Mesic, Aquic, Organic Depressions and Seeps Found on floodplains and seeps at lower elevation. Confined to depressions and other areas of water accumulation; water table at 0 to 6 inches with mucky surface texture. Site vegetation is dominated by a mix of wetland adapted species including <i>Spiraea</i> , <i>Alnus viridis</i> , <i>Carex</i> , and <i>Sphagnum</i>
F043AY521WA	Warm-Frigid, Moist- Xeric Loamy Foothills/Mountainsides, ashy surface (Grand Fir Warm Dry Shrub) <i>Abies grandis</i> - <i>Pseudotsuga menziesii</i> / <i>Physocarpus malvaceus</i> - <i>Symphoricarpos albus</i> Found on lower Hill slopes, mountain slopes and terraces. Textures are loamy and sites lack a high water table. The soil surface has a distinct layer of volcanic ash material. Overstory species include <i>Abies grandis</i> and <i>Pseudotsuga menziesii</i> var. <i>glauca</i> . The understory is typified by <i>Physocarpus malvaceus</i> , <i>Symphoricarpos albus</i> , <i>Calamagrostis rubescens</i> , and <i>Hieracium albiflorum</i> .
F043AY519WA	Warm-Frigid, Xeric, Loamy Slopes, low AWC subsoils (Douglas-Fir/Warm Dry Shrub) <i>Pseudotsuga menziesii</i> / <i>Physocarpus malvaceus</i> - <i>Symphoricarpos albus</i> Sites are on warm, dry aspects of hills and mountains. They are usually less about 30 inches deep with abundant rock fragments in the profile. Surfaces have some weak volcanic ash influence. Overstory species include <i>Pseudotsuga menziesii</i> var. <i>glauca</i> , and <i>Pinus ponderosa</i> . The understory is typified by <i>Physocarpus malvaceus</i> , <i>Symphoricarpos albus</i> , <i>Calamagrostis rubescens</i> , and <i>Bromus vulgaris</i> .

Similar sites

F043AY522WA	Warm-Frigid, Moist- Xeric Loamy Foothills/Mountainsides, mixed ash surface (Grand Fir Warm Dry Shrub) <i>Abies grandis</i> - <i>Pseudotsuga menziesii</i> / <i>Physocarpus malvaceus</i> - <i>Symphoricarpos albus</i> Found on hill and mountain side slopes adjacent to valleys. Lack a high water table. Overstory species include <i>Abies grandis</i> and <i>Pseudotsuga menziesii</i> var. <i>glauca</i> . The understory is typified by <i>Physocarpus malvaceus</i> , <i>Symphoricarpos albus</i> , <i>Calamagrostis rubescens</i> , and <i>Hieracium albiflorum</i> .
F044AY506WA	Warm-Frigid, Xeric, Loamy, Foothills and Stream Terraces, High Water Table (Douglas-Fir Warm Dry Shrub) Found on lower warmer terraces and foot slopes having a water table within 20 to 30 inches of the ground surface in spring. Overstory species are <i>Pseudotsuga menziesii</i> var. <i>glauca</i> and <i>Pinus ponderosa</i> . The understory is typified by <i>Symphoricarpos albus</i> , <i>Physocarpus malvaceus</i> , <i>Carex</i> , and <i>Calamagrostis rubescens</i> .

Table 1. Dominant plant species

Tree	(1) <i>Abies grandis</i> (2) <i>Pseudotsuga menziesii</i> var. <i>glauca</i>
Shrub	(1) <i>Physocarpus malvaceus</i> (2) <i>Symphoricarpos albus</i>
Herbaceous	(1) <i>Calamagrostis rubescens</i> (2) <i>Hieracium albiflorum</i>

Physiographic features

Physiographic Features

Landscapes: Foothills, Valleys

Landform: outwash terraces, lake terraces and outwash plains

Elevation (m): Total range = 495 to 1185 m

(1,625 to 3,885 feet)

Central tendency = 645 to 860 m

(2,115 to 2,820 feet)

Slope (percent): Total range = 0 to 40 percent

Central tendency = 1 to 15 percent

Table 2. Representative physiographic features

Landforms	(1) Foothills > Hillslope (2) Valley > Outwash terrace
Flooding frequency	None
Ponding frequency	None
Elevation	2,115–2,820 ft
Slope	1–15%
Water table depth	21 in
Aspect	W, SE, S, SW

Table 3. Representative physiographic features (actual ranges)

Flooding frequency	None
Ponding frequency	None
Elevation	1,625–3,885 ft
Slope	0–40%
Water table depth	16–30 in

Climatic features

Climatic Features

Frost-free period (days): Total range = 95 to 130 days

Central tendency = 110 to 120 days

Mean annual precipitation (cm): Total range = 355 to 1065 mm

(14 to 42 inches)

Central tendency = 555 to 760 mm

(22 to 30 inches)

MAAT (C): Total range = 4.8 to 9.3

(41 to 49 F)

Central tendency = 6.7 to 8.0

(44 to 46 F)

Climate Stations: CHEWELAH, CHEWELAH MTN LOOKOUT, Teepee Seed Orchard

Table 4. Representative climatic features

Frost-free period (characteristic range)	110-120 days
Freeze-free period (characteristic range)	
Precipitation total (characteristic range)	22-30 in
Frost-free period (actual range)	95-130 days
Freeze-free period (actual range)	
Precipitation total (actual range)	14-42 in

Influencing water features

Water Table Depth (cm):

40 cm to 75 cm (median = 53 cm)

(16 to 30 inches; median = 21 inches)

Soil features

Representative Soil Features

This ecological subsite is associated with several soil series (e.g. Kegel, Mokins, Fan Lake, Dalkena, Wolfeson, Martella). The soil components can be grouped into: Fluvaquentic Haploxerolls, Andic Haploxeralfs, Vitrandic Haploxerepts, and Oxyaquic Vitrandic Haploxerepts. These soils have developed in thin or mixed Mazama tephra deposits over glaciolacustrine, outwash and alluvium from mixed sources. The soils are 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: outwash, glaciolacustrine material and alluvium

Origin: unspecified

Fragment content of surface: 0 to 6 percent (median = 1%)

Subsurface Texture Group: Loamy

Fragment content of subsurface (25 to 100cm): 0 to 23 percent (median = 2%)

Most components lack surface fragments

Drainage Class: Moderately Well drained and Somewhat Poorly drained

Saturated Hydraulic conductivity: Moderately high to High

Soil Depth: 68% of components have no restriction within 150 cm

Abrupt textural change when present is at 56 to 76 cm (median = 56 cm)

Calcium Carbonate Equivalent (percent): 0 to 3 (median = 0)

Soil Reaction (1:1 Water): 4.8 to 7.3

Available Water Capacity (total in 100cm): 13.74-19.58cm (median = 15.64 cm)

Table 5. Representative soil features

Parent material	(1) Volcanic ash (2) Outwash (3) Alluvium (4) Glaciolacustrine deposits
Surface texture	(1) Ashy very fine sandy loam (2) Ashy fine sandy loam (3) Ashy silt loam
Drainage class	Somewhat poorly drained to moderately well drained
Depth to restrictive layer	150–200 in
Soil depth	Not specified

Ecological dynamics

A description of vegetation dynamics and a state and transition model can be found in Ecological Site Group EX043AESG06

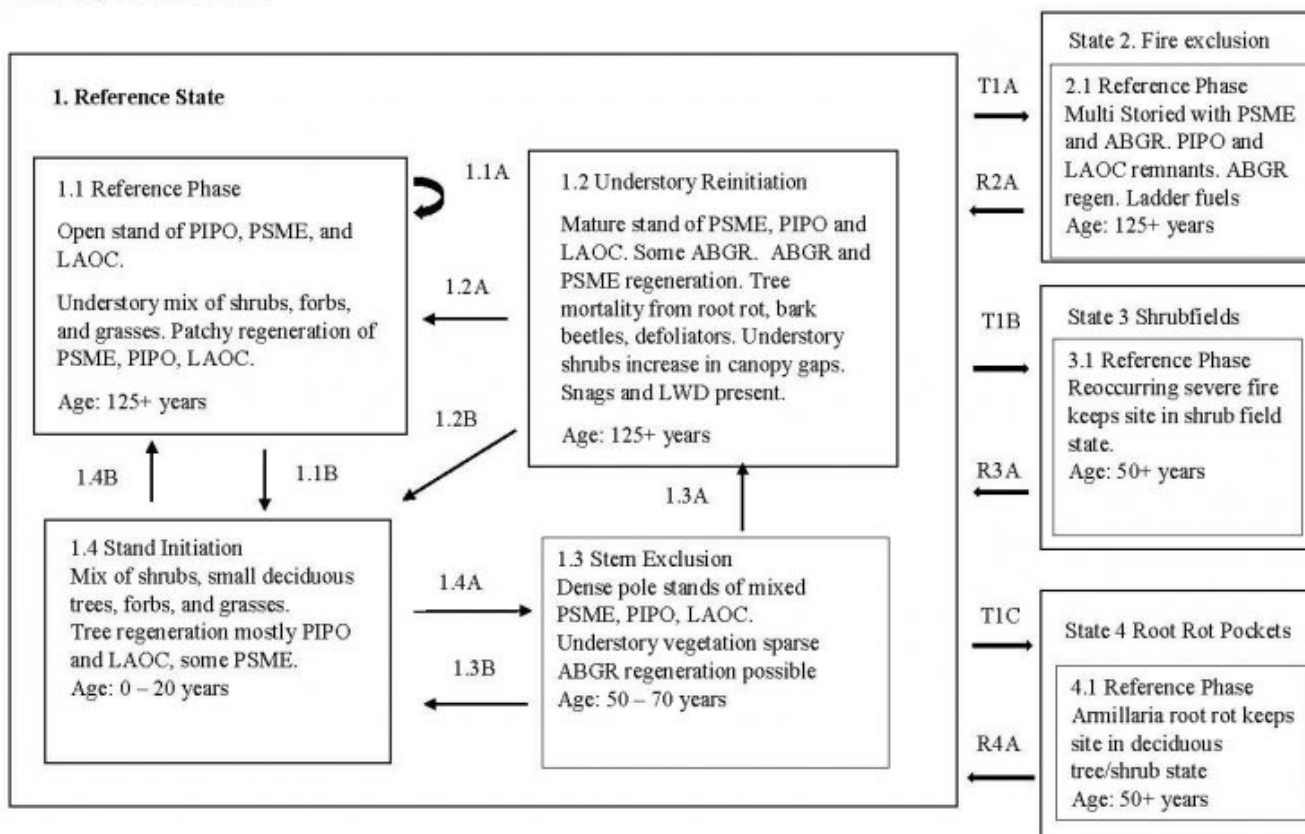
State and transition model

State and Transition Diagram

Ecological Site

Frigid Xeric Ashy Slopes (Grand Fir Warm Dry Shrub)

Grand fir / mallow ninebark



Legend

Pathways

1.1A Stand Initiation Reference Phase Stand replacing fire.

1.2A Understory Re-initiation Mixed severity and low ground fires open stand.

1.2B Stand Initiation Stand replacing fire.

1.3A Time. Stand grows to mature stage, canopy gaps occur from overstory mortality

1.3B Stand replacing fire

1.4A Time. Seedlings/saplings grow to dense pole stage

1.4B Stand Initiation Fire at 10 – 15-year intervals keep stand in open condition.

Transitions

T1A Fire Exclusion

T1B Reoccurring severe fire with soil degradation keeping a shrub field state

T1C Root rot pockets killing Douglas-fir and Grand fir creating a deciduous vegetation state

R2A Selective overstory removal with prescribed burning

R3A Tree planting with proper site selection

R4A Site preparation and tree planting with larch and/or ponderosa pine

References

. 2016. United States national vegetation classification database, V2.0.. United States National Vegetation Classification.. Federal Geographic Data Committee, Vegetation Subcommittee., Washington, D.C..

Contributors

Brian Gardner

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Approval

Kirt Walstad, 9/07/2023

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	05/12/2025
Approved by	Kirt Walstad
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:**

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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:

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):**
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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:**
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17. **Perennial plant reproductive capability:**
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