

Ecological site AX001X03X410

Mesic Udic Forest

Last updated: 1/23/2025
Accessed: 09/25/2026

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): 001X–Northern Pacific Coast Range, Foothills, and Valleys

This long and narrow resource area stretches along the Pacific Border Province of the Pacific Mountain System in Oregon and Washington. The area is bounded by the Olympic Mountains on the north and the Klamath Mountains on the south. Most of the area consists of hills and low mountains with gentle to steep slopes. The parent materials are composed primarily of young Tertiary sedimentary rocks with some minor volcanic rocks. Glacial till and outwash deposits are found in the northern half of the area within Washington. In the far southern portion of the area, near the Klamath Mountains, the sedimentary rocks are older and some have been metamorphosed. The average annual precipitation ranges from 60 to 200 inches, increasing with elevation. The dominant soil orders in this MLRA are Andisols, Inceptisols, and Ultisols. Soil depth ranges from shallow to very deep. While most soils in the area are well drained and occur on foothills, mountain slopes and ridges, floodplain and depressional soils can range from well drained to very poorly drained. Soil textures are typically medial, loamy, or clayey. The dominant soils in the area have a mesic or frigid soil temperature regime and a udic soil moisture regime; however, soils with an aquic soil moisture regime or cryic soil temperature regime do occur.

LRU notes

The Central Pacific Coast Range land resource unit (LRU 3) of MLRA 1 ranges from the Olympic Peninsula south into northern Oregon. LRU 3 is located south of the Olympic National Forest and extends to the Siletz River in Oregon. LRU 3 is bounded on the west by MLRA 4a Sitka Spruce Belt and MLRA 2 Willamette and Puget Sound Valleys to the east. Several major rivers have headwaters in this LRU or carved valleys through the landscape depositing more recent alluvium. These include the Chehalis, Columbia, Grays, Humptulips, Klaskanine, Nehalem, Satsop, Siletz, Willapa, Wilson, Wynoochee, and Yamhill Rivers.

Ecological site concept

This ecological site is found on the western Coast Range in the Pacific Northwest from southern Washington to northern Oregon. This ecological site is densely forested and is often lush. Elevations are typically between 50 and 3,600 feet with slopes ranging from 0 to 90 percent. The most common overstory species are western hemlock (*Tsuga heterophylla*) and Douglas-fir (*Pseudotsuga menziesii*). Western redcedar (*Thuja plicata*) may be present as a minor component. Red alder (*Alnus rubra*) and bigleaf maple (*Acer macrophyllum*) may be common where there are forest openings. Regeneration of red alder and bigleaf maple is limited by canopy cover and is commonly in gaps where sunlight is most available. Common understory species include salal (*Gaultheria shallon*), vine maple (*Acer circinatum*), red huckleberry (*Vaccinium parvifolium*), Cascade Oregongrape (*Mahonia nervosa*), trailing blackberry (*Rubus ursinus*), and western swordfern (*Polystichum munitum*). The most common disturbance on this site is from windthrow of overstory trees, which results in patchy, small pockets of open areas. These areas commonly occur in conjunction with either root-, butt- or stem-rot. Western hemlock is highly susceptible to rot diseases from fungi such as; *Armillaria ostoyae*, *Heterobasidion annosum*, *Phellinus weirii*, and *Echinodontium tinctorium* which may exacerbate the extent and area of disturbance. The resulting openings in the canopy allow sunlight to reach the forest floor, benefiting the understory. Disturbance by fire is infrequent as a result of the high humidity and precipitation within the western hemlock zone; however, the site has a fire regime between 150-400 years and may experience stand replacing catastrophic wildfires (US Department of Agriculture, 2012).

Associated sites

AX001X03X402	Frigid Udic Forest Frigid Udic Forest is located at higher elevations than Mesic Udic Forest. The prominence of deerfoot vanillaleaf (<i>Achlys triphylla</i>) is a good indicator for Frigid Udic Forest.
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Table 1. Dominant plant species

Tree	(1) <i>Tsuga heterophylla</i> (2) <i>Pseudotsuga menziesii</i>
Shrub	(1) <i>Gaultheria shallon</i> (2) <i>Mahonia nervosa</i>
Herbaceous	(1) <i>Polystichum munitum</i>

Legacy ID

F001XC410OR

Physiographic features

This ecological site is found on mountain slopes, terraces, moraines, and hillslopes of the Cascade Mountains. Elevations are typically between 50 and 3,600 feet with slopes ranging from 0 to 90 percent.

Table 2. Representative physiographic features

Landforms	(1) Mountains > Mountain slope (2) Mountains > Moraine (3) Mountains > Hillside or mountainside (4) Mountains > Terrace
Flooding frequency	None to occasional
Ponding frequency	None
Elevation	20 – 1,100 m
Slope	0 – 90 %
Aspect	W, NW, N, NE, E, SE, S, SW

Climatic features

The climate has warm, moist summers and cool, wet winters. Mean annual precipitation ranges from 70 to 130 inches and occurs mostly as rain, when snow occurs it does not persist. Average annual temperatures range from 45 to 52 degrees F. The mild temperatures, abundant precipitation, and a long growing season result in highly productive forestlands.

Table 3 Representative climatic features

Frost-free period (characteristic range)	100-240 days
Freeze-free period (characteristic range)	170-210 days
Precipitation total (characteristic range)	1,780-3,300 mm

Climate stations used

- (1) VERNONIA NO 2 [USC00358884], Vernonia, OR
- (2) LAUREL MTN [USC00354776], Falls City, OR
- (3) GRAYS RIVER HATCHERY [USC00453333], Grays River, WA
- (4) CLATSKANIE [USC00351643], Clatskanie, OR

Influencing water features

In general, this ecological site is not influenced by wetland or riparian water features but may be found on stream terraces or adjacent to wetland and riparian areas. This site does not experience flooding or ponding.

Soil features

Soils that support this ecological site occur in the mesic soil temperature regime and the udic soil moisture regime. The soil is neither wet nor dry throughout the growing season.

Table 4. Representative soil features

Parent material	(1) Colluvium – siltstone (2) Colluvium – igneous rock (3) Residuum – igneous rock
Surface texture	(1) Silt loam (2) Gravelly loam (3) Loam (4) Clay loam (5) Gravelly clay loam (6) Medial silt loam (7) Medial loam
Drainage class	Moderately well drained to somewhat excessively drained
Depth to restrictive layer	30 – 150 cm
Soil depth	30 – 150 cm

Surface fragment cover <=3"	0 – 40 %
Surface fragment cover >3"	0 – 30 %
Clay content (2.5-15.2cm)	10 – 40 %
Subsurface fragment volume <=3" (2.5-152.4cm)	0 – 60 %
Subsurface fragment volume >3" (2.5-152.4cm)	0 – 50 %

Ecological dynamics

State and transition model

Additional community tables

Table 5. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
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Table 6. Community 1.2 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
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Table 7. Community 1.3 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
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Table 8. Community 1.4 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
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Table 9. Community 2.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
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Table 10. Community 2.2 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
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Table 11. Community 2.3 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
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Inventory data references

Other Established Classifications for Ecological Site National Vegetation Classification: G240 North Pacific Maritime Douglas-fir-Western Hemlock Forest Group and A3378 Tsuga heterophylla – Pseudotsuga menziesii / Cornus unalaschensis Mesic Forest Alliance USDA Forest Service Plant Association and Management Guide of the Northern Oregon Coast Range: western hemlock/dwarf Oregon grape-

Other references

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Contributors

Carri Gaines
Erin Kreutz
Erik Dahlke

Approval

Kirt Walstad, 1/23/2025

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	12/16/2021
Approved by	
Approval date	

Composition (Indicators 10 and 12) based on	Annual Production
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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:
