

Ecological site F006XA006WA

Cold Cryic Udic Mountain Slopes

(Pacific Silver fir Cold Moist Shrub/Herb)

Last updated: 2/14/2025
Accessed: 08/31/2026

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): 006X–Cascade Mountains, Eastern Slope

Major Land Resource Area (MLRA): 006X–Cascade Mountains, Eastern Slope. Stretching from northern Washington to southern Oregon, MLRA 6 encompasses the mountain slopes, foothills, elevated plateaus and valleys on the eastern slopes of the Cascade mountains. This MLRA is a transitional area between the Cascade Mountains to the west and the lower lying Columbia Basalt Plateau to the east. Situated in the rain shadow of the Cascade Crest, this MLRA receives less precipitation than portions of the cascades further west and greater precipitation than the basalt plateaus to the east. Geologically, the majority of the MLRA is dominated by Miocene volcanic rocks, while the northern portion is dominated by Pre-Cretaceous metamorphic rocks and the southern portion is blanketed with a thick mantle of ash and pumice from Mount Mazama. The soils in the MLRA dominantly have a mesic, frigid, or cryic soil temperature regime, a xeric soil moisture regime, and mixed or glassy mineralogy. They generally are moderately deep to very deep, well drained, and loamy or ashy. Biologically, the MLRA is dominated by coniferous forest, large expanses of which are dominated by ponderosa pine, Douglas-fir or lodgepole pine. Areas experiencing cooler and moister conditions include grand fir, white fir, and western larch while the highest elevations include pacific silver fir, subalpine fir and whitebark pine. Economically, timber harvest and recreation are important land uses in these forests. Historically, many of these forests would have experienced relatively frequent, low and mixed severity fire favoring the development of mature forests dominated by ponderosa pine or Douglas-fir. In the southern pumice plateau forests, less frequent, higher severity fire was common and promoted the growth of large expanses of lodgepole pine forests.

LRU notes

This ecological site resides on mountain slopes in the mountains at elevations of 2900 to 4900 feet on slopes 8 to 60 percent. The climate is cool and moist with 35 to 100 frost free days, mean annual air temperatures average 37 to 42 degrees Fahrenheit, and the mean annual precipitation ranges 35 to 70 inches.

Classification relationships

The ecological site relates to the Wenatchee National Forest plant associations: CFS556 - Pacific silver fir/Cascade azalea-big huckleberry (ABAM/RHAL-VAME) CFF254 - Pacific silver fir/deerfoot vanillaleaf (ABAM/ACTR) CFS542 - Pacific silver fir/rusty menziesia (ABAM/MEFE)

Ecological site concept

The soils are Andisols, specifically Humic or Xeric Vitricryands that have and ashy-skeletal or ashy-pumiceous particle-size class, and Spodosols, specifically Andic Humicryods that have medial-skeletal over loamy-skeletal class. The parent materials are volcanic ash mixed with colluvium or pumice. These soils are in the cryic soil temperature and udic soil moisture regimes. These are well drained soils with no flooding, ponding or water table. The Reference Community has *Abies amabilis* in the overstory and lower canopy layers, though seral species may be present in low cover including: ABGR, ABLA, PICO, PIMO3, PSME, TSHE, TSME. The understory is diverse and can include: RHAL2, ACTR, CLUN2, GOOB2, MEFE, PYROL, VAME, CARU, CHUM, GAOV2, LIBOL2, MANE2, PAMY, RUPA, ACHIL, CAGE2, FRAGA, MARE11, RIBES, ROSA5, VACA13, VACCI. The ecological site relates to the USFS plant associations: Pacific silver fir/Cascade azalea-big huckleberry, Pacific silver fir/deerfoot vanillaleaf and Pacific silver fir/rusty menziesia.

Associated sites

F006XA003WA	Cryic Xeric Mountain Slopes (Subalpine fir Cool Moderately Dry Shrub/Herb) Slightly warmer and drier.
--------------------	---

Similar sites

F006XB002WA	Cold Cryic Udic Mountain Slopes (Mountain Hemlock Cold Moderately Moist Shrub/Herb) Higher elevations
--------------------	---

Table 1. Dominant plant species

Tree	(1) <i>Abies amabilis</i>
Shrub	Not specified
Herbaceous	Not specified

Physiographic features

This ecological site resides on mountain slopes in the mountains at elevations of 2900 to 4900 feet on slopes of 8 to 55 percent.

Table 2. Representative physiographic features

Landforms	(1) Mountains > Mountain slope
Flooding frequency	None
Ponding frequency	None
Elevation	880 – 1,490 m
Slope	10 – 60 %
Aspect	W, NW, N, NE, E, SE, S, SW

Climatic features

The climate is cool and moist with average frost-free days of 43 to 87 days, mean annual air temperatures average 37 to 42 degrees Fahrenheit and the mean annual precipitation ranges 48 to 62 inches.

Table 3 Representative climatic features

Frost-free period (actual range)	40-90 days
----------------------------------	------------

Freeze-free period (actual range)	
Precipitation total (actual range)	1,220-1,580 mm

Influencing water features

This site is not influenced by water from a wetland or stream.

Wetland description

N/A

Soil features

The soils are Andisols, specifically Humic or Xeric Vitricryands that have and ashy-skeletal or ashy-pumiceous particle-size class, and Spodosols, specifically Andic Humicryods that have medial-skeletal over loamy-skeletal class. The parent materials are volcanic ash mixed with colluvium or pumice. These soils are in the cryic soil temperature and udic soil moisture regimes. These are well-drained soils with no flooding, ponding or water table.

Table 4. Representative soil features

Parent material	(1) Volcanic ash (2) Colluvium (3) Pumice
Surface texture	(1) Ashy sandy loam
Family particle size	(1) Ashy-skeletal (2) Ashy-pumiceous
Drainage class	Well drained
Depth to restrictive layer	100 – 150 cm
Soil depth	100 – 150 cm
Surface fragment cover <=3"	0 – 20 %
Surface fragment cover >3"	0 – 10 %

Ecological dynamics

The fire return interval is generally rare (200 to 500 years) and is stand replacing, *Abies amabilis* is a fire avoider, meaning it perishes in fire although the resident seedbank and windblown tree seedlings quickly re-establish, shrubs re-sprout and pioneering herbaceous species establish on the site post-fire. Shrubs form a post-disturbance phase and include vine maple, Douglas maple, Scouler willow,

pachistima, big huckleberry, serviceberry, Sitka alder and snowbrush ceanothus. Fires on the east side of the continental divide are more frequent due to the continental climate factors. Fire is a rare, large patch disturbance while diseases and insects are frequent, small disturbances that serve to open the tree canopy in patches and include: annosum and laminated root disease in ABLA, PIEN, ABAM, ABGR, TSHE, TSME; Indian paint fungus, mistletoe; severe outbreaks w/ mountain pine beetle (sere PICO), silver fir beetle.

FIRE

Rare, stand replacement 200-500 FRI

- FEIS: FRI=200-500 yrs. Severe stand replacing fire. IS A FIRE AVOIDER – PERISHES IN FIRE.
 - WENA FRI=400 yrs.
 - LANDFIRE: BPS 0111740 North Pacific Dry-Mesic Silver Fir-Western Hemlock-Douglas-fir Forest
- Site index: Pacific Silver fir 55 – 90 100TA, Hoyer, Herman 1989 (05); Subalpine fir 60 – 80 100BA, Alexander 1967 (412); Douglas-fir 50 – 73 50BA, Cochran 1979b (765); Mountain Hemlock 70 100TA, Barnes 1962 (990); Grand fir 50 – 60 50BA, Cochran 1979a (031); Lodgepole pine 60 – 75 100TA, Alexander 1966 (520); Western hemlock 70 – 80 100TA, Barnes 1962 (990); Western larch 45 – 57 50TA, Schmidt 1976 (265); Western white pine 40 50TA, Haig 1932 (570)

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 (%)
-------	-------------	--------	-----------------	----------------------	------------------

Table 6. Community 1.2 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
-------	-------------	--------	-----------------	----------------------	------------------

Table 7. Community 1.3 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
-------	-------------	--------	-----------------	----------------------	------------------

Table 8. Community 1.4 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
-------	-------------	--------	-----------------	----------------------	------------------

Inventory data references

Information presented here has been derived from NRCS data. Field observations from range trained personnel were also used. Other sources used as references include USDA NRCS Water and Climate Center, USDA NRCS National Range and Pasture Handbook, and USDA NRCS Soil Surveys from various counties.

Other references

Lillybridge, Terry R., et al. "Field guide for forested plant associations of the Wenatchee National Forest." Gen. Tech. Rep. PNW-GTR-359. Portland, OR: US Department of Agriculture, Forest Service, Pacific Northwest Research Station. 335 p. In cooperation with: Pacific Northwest Region, Wenatchee National Forest 359 (1995).

Brockway, Dale G. Plant association and management guide for the Pacific silver fir zone: Gifford Pinchot National Forest. US Department of Agriculture, Forest Service, Pacific Northwest Region, 1983.

Henderson, Jan A. Field guide to the forested plant associations of the Mt. Baker-Snoqualmie National Forest. Vol. 28. No. 91. USDA, Forest Service, Pacific Northwest Region, 1992.

Landfire, USFS FEIS.

Contributors

Gary Kuhn
Steve Campbell

Approval

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	02/14/2025
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):

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:
