

Ecological site F003XY705OR

High Cascades Dry

Last updated: 2/04/2025

Accessed: 05/11/2025

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.

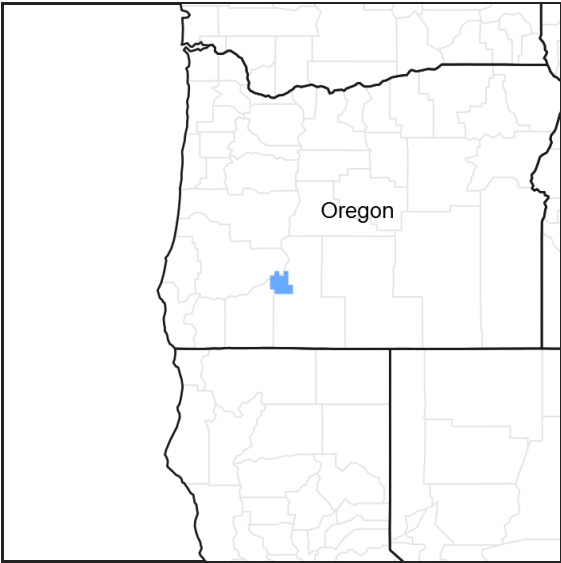


Figure 1. Mapped extent

Areas shown in blue indicate the maximum mapped extent of this ecological site. Other ecological sites likely occur within the highlighted areas. It is also possible for this ecological site to occur outside of highlighted areas if detailed soil survey has not been completed or recently updated.

Table 1. Dominant plant species

Tree	(1) <i>Tsuga mertensiana</i>
Shrub	(1) <i>Arctostaphylos nevadensis</i>
Herbaceous	(1) <i>Chimaphila umbellata</i>

Physiographic features

Table 2. Representative physiographic features

Landforms	(1) Stratovolcano (2) Ash flow
Flooding frequency	None
Ponding frequency	None
Elevation	1,524–2,438 m
Slope	10–100%
Water table depth	152 cm
Aspect	S

## Climatic features

Winters are long, cold, windy and snowy, due to the very high elevations. Summers are short and cool. Effective precipitation comes mostly as snow. Average annual ppt is 67 inches.

**Table 3. Representative climatic features**

Frost-free period (average)	35 days
Freeze-free period (average)	75 days
Precipitation total (average)	2,540 mm

## Influencing water features

None

## Soil features

Soils formed in andesitic lava flows and pumice/ash flows. They are located primarily on moderate to very steep slopes on mountain sides, cadera rims, and ravines eroded in ash flow valley fill.

**Table 4. Representative soil features**

Surface texture	(1) Paragravelly loamy sand (2) Gravelly loamy sand (3) Ashy loamy fine sand
Family particle size	(1) Sandy
Drainage class	Somewhat excessively drained to excessively drained
Permeability class	Rapid to very rapid
Soil depth	152 cm
Surface fragment cover <=3"	0–35%
Surface fragment cover >3"	0–25%
Available water capacity (0-101.6cm)	7.37–20.32 cm
Electrical conductivity (0-101.6cm)	0 mmhos/cm
Sodium adsorption ratio (0-101.6cm)	0
Soil reaction (1:1 water) (0-101.6cm)	5.6–7.3
Subsurface fragment volume <=3" (Depth not specified)	10–45%
Subsurface fragment volume >3" (Depth not specified)	0–35%

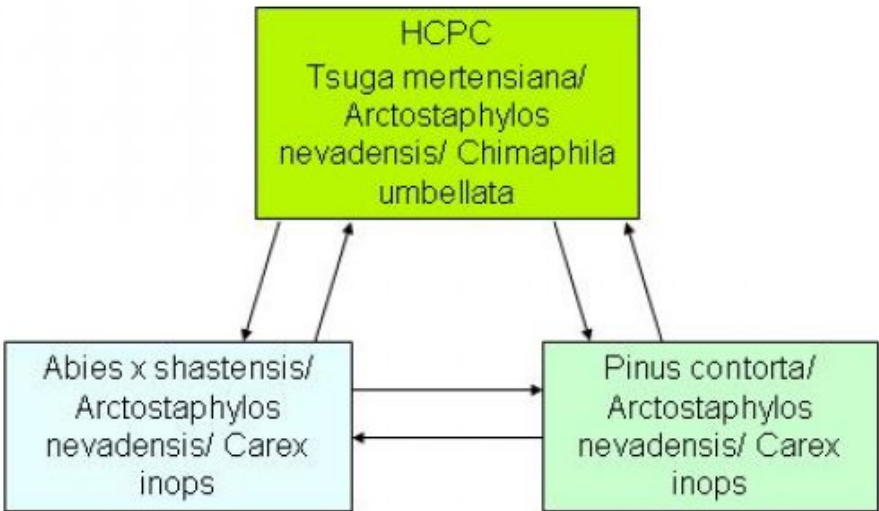
## Ecological dynamics

Due to the high elevation and long periods of snow cover, fire return intervals are long (400+ years). This long period between fires allow the climax plant community to develop. Mountain hemlock has adapted to the climate, is shade tolerant and is the dominant climax overstory specie. When a fire does occur it is normally a stand replacement fire that kills all trees.

Mountain hemlock, especially mature trees, are very susceptible to laminated root rot (*Phellinus weiri*). Openings

created allow new seedlings (of any specie) to regenerate.

State and transition model



State 1  
Reference

Community 1.1  
Mountain Hemlock

Mountain hemlock plant community is the historic climax plant community. Mountain hemlock is the dominant tree in the overstory with less amounts of Shasta red fir, Western white pine, and Lodgepole pine. Subalpine fir is occasionally present. This site is drier than other Mountain hemlock sites. Many areas are south facing that have a high solar gain. The site will lose the snow earlier and dry out much sooner than other sites. Ground species that are more drought tolerant can be found on this site.

**Forest overstory.** The typical forest Overstory for the historic climax plant community.

**Forest understory.** The typical forest understory for the plant community. The vegetation description describes vegetation below 4.5 feet. A "0" represents a canopy cover of less than 1 percent.

Table 5. Ground cover

Tree foliar cover	35-45%
Shrub/vine/liana foliar cover	1-5%
Grass/grasslike foliar cover	0-1%

Forb foliar cover	0-2%
Non-vascular plants	0%
Biological crusts	0%
Litter	15-20%
Surface fragments >0.25" and <=3"	15-20%
Surface fragments >3"	5-8%
Bedrock	0%
Water	0%
Bare ground	10-20%

**Table 6. Soil surface cover**

Tree basal cover	0%
Shrub/vine/liana basal cover	1-2%
Grass/grasslike basal cover	0-1%
Forb basal cover	0-1%
Non-vascular plants	0%
Biological crusts	0%
Litter	35-40%
Surface fragments >0.25" and <=3"	20-30%
Surface fragments >3"	5-10%
Bedrock	0%
Water	0%
Bare ground	15-20%

**Table 7. Canopy structure (% cover)**

Height Above Ground (M)	Tree	Shrub/Vine	Grass/ Grasslike	Forb
<0.15	—	1-5%	0-1%	0-2%
>0.15 <= 0.3	0-1%	—	—	—
>0.3 <= 0.6	0-1%	—	—	—
>0.6 <= 1.4	0-1%	—	—	—
>1.4 <= 4	1-5%	—	—	—
>4 <= 12	5-10%	—	—	—
>12 <= 24	25-30%	—	—	—
>24 <= 37	1-5%	—	—	—
>37	—	—	—	—

## Community 1.2

### Shasta red fir

Shasta red fir plant community is a seral plant community moving towards the historic climax plant community. It starts as the lodgepole pine plant community matures. The fir establishes under the lodgepole and slowly takes over the canopy as the lodgepole dies. Understory vegetation is sparse. Drought hardy species like pinemat manzanita and longstolon sedge can be found.

**Forest overstory.** The typical forest overstory composition of the Shasta red fir plant community

**Forest understory.** The typical forest understory for the plant community. The vegetation description describes vegetation below 4.5 feet. A "0" represents a canopy cover of less than 1 percent.

**Table 8. Canopy structure (% cover)**

Height Above Ground (M)	Tree	Shrub/Vine	Grass/ Grasslike	Forb
<0.15	—	5-10%	1-5%	0-1%
>0.15 <= 0.3	0-1%	—	—	—
>0.3 <= 0.6	1-5%	—	—	—
>0.6 <= 1.4	1-5%	—	—	—
>1.4 <= 4	1-5%	—	—	—
>4 <= 12	5-10%	—	—	—
>12 <= 24	25-30%	—	—	—
>24 <= 37	1-5%	—	—	—
>37	—	—	—	—

### Community 1.3 Lodgepole Pine

Lodgepole pine establishes after a stand replacement fire has occurred in the Mountain hemlock or Shasta red fir plant communities. Density can be light to very heavy. Heavy to very heavy stands can become susceptible to Mountain pine beetle infestations. An outbreak generally kills all trees. If Shasta red fir or mountain hemlock have established under the lodgepole they will be released. If Shasta red fir or Mountain hemlock are not present then lodgepole pine will re-establish. Ground vegetation composition and cover are sparse.

**Forest overstory.** The typical overstory composition of the Lodgepole pine plant community.

**Forest understory.** The typical forest understory for the plant community. The vegetation description describes vegetation below 4.5 feet. A "0" represents a canopy cover of less than 1 percent.

**Table 9. Ground cover**

Tree foliar cover	20-30%
Shrub/vine/liana foliar cover	3-6%
Grass/grasslike foliar cover	5-8%
Forb foliar cover	0-1%
Non-vascular plants	0%
Biological crusts	0%
Litter	15-20%
Surface fragments >0.25" and <=3"	20-25%
Surface fragments >3"	3-8%
Bedrock	0%
Water	0%
Bare ground	20-25%

**Table 10. Soil surface cover**

Tree basal cover	0%
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Shrub/vine/liana basal cover	1-2%
Grass/grasslike basal cover	1-3%
Forb basal cover	0-1%
Non-vascular plants	0%
Biological crusts	0%
Litter	20-25%
Surface fragments >0.25" and <=3"	25-30%
Surface fragments >3"	5-10%
Bedrock	0%
Water	0%
Bare ground	30-35%

**Table 11. Canopy structure (% cover)**

Height Above Ground (M)	Tree	Shrub/Vine	Grass/ Grasslike	Forb
<0.15	0-1%	3-6%	5-8%	0-1%
>0.15 <= 0.3	1-2%	—	—	—
>0.3 <= 0.6	1-2%	—	—	—
>0.6 <= 1.4	0-1%	—	—	—
>1.4 <= 4	3-6%	—	—	—
>4 <= 12	8-10%	—	—	—
>12 <= 24	25-30%	—	—	—
>24 <= 37	—	—	—	—
>37	—	—	—	—

**Pathway 1.1A**  
**Community 1.1 to 1.2**

**Pathway 1.1B**  
**Community 1.1 to 1.3**

**Pathway 1.2A**  
**Community 1.2 to 1.1**

**Pathway 1.2B**  
**Community 1.2 to 1.3**

**Pathway 1.3A**  
**Community 1.3 to 1.1**

**Pathway 1.3B**  
**Community 1.3 to 1.2**

**Additional community tables**

**Contributors**

C Ziegler

## Approval

Kirt Walstad, 2/04/2025

### 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	05/11/2025
Approved by	Kirt Walstad
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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