Ecological site F003XY701OR
High Cascades Wet

Accessed: 04/23/2024

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.

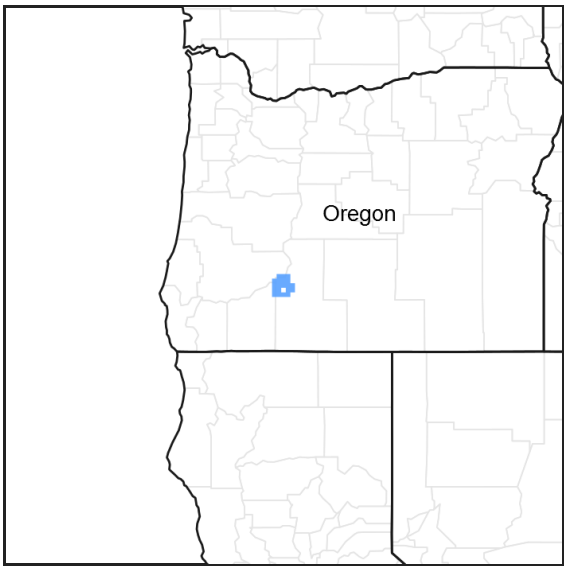


Figure 1. Mapped extent

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) *Tsuga mertensiana*
Shrub	(1) *Vaccinium scoparium*
Herbaceous	(1) *Chimaphila umbellata*

Physiographic features

The site is on deep, moderately well drained and moderate to steeply sloping soils cindercones, glacial moraines and pumice and ash flow deposits.

Table 2. Representative physiographic features

Landforms	(1) Ground moraine (2) Cinder cone (3) Ash flow
Flooding frequency	None
Ponding frequency	None
Elevation	4,500–7,500 ft
Slope	0–60%

Water table depth	60 in
Aspect	N

Climatic features

Precipitation comes mostly as snow. Winters are snowy and cold. Summers are cool and dry. Summer thunderstorms do occur, providing occasional summer precipitation.

Table 3. Representative climatic features

Frost-free period (average)	45 days
Freeze-free period (average)	90 days
Precipitation total (average)	100 in

Influencing water features

None

Soil features

Soils derived from the volcanic activity of Mount Mazama. They formed from ash flows from the eruption and as cinder cones developed on the flanks of the volcano. Soils that developed from glacial activity are also included.

Table 4. Representative soil features

Surface texture	(1) Paragravelly loamy sand (2) Gravelly loam
Family particle size	(1) Sandy
Drainage class	Moderately well drained to excessively drained
Permeability class	Moderate to very rapid
Soil depth	20–60 in
Surface fragment cover <=3"	5–35%
Surface fragment cover >3"	0–35%
Available water capacity (0-40in)	3.4–14.7 in
Calcium carbonate equivalent (0-40in)	0%
Electrical conductivity (0-40in)	0 mmhos/cm
Sodium adsorption ratio (0-40in)	0
Soil reaction (1:1 water) (0-40in)	5.6–6.5
Subsurface fragment volume <=3" (Depth not specified)	15–50%
Subsurface fragment volume >3" (Depth not specified)	0–50%

Ecological dynamics

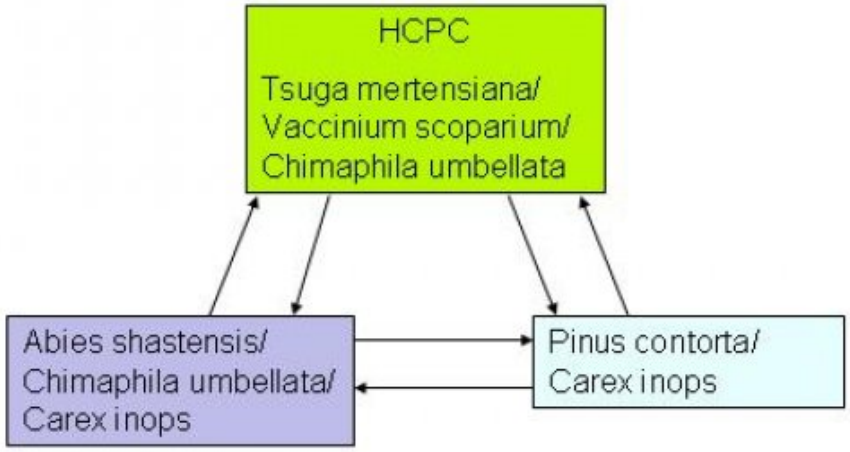
Mountain hemlock is the dominant specie in the overstory, with lesser amounts of Shasta red fir and Western white

pine present. The major disturbance factor in this site is fire and disease.

Due to the high elevation and long periods of snow cover, fire return intervals are long (possibly 400+ years). When fire does occur it is usually a stand replacement fire, consuming all trees. After such a fire Lodgepole pine, a pioneer specie, establishes and starts the succession process all over again.

Older mountain hemlock trees are susceptible to disease, especialy laminated root rot (phellinus weirii). The disease kills trees creating openings for grass/forb/shrub growth or for new seedlings to become established.

State and transition model



State 1
Mountain Hemlock

Community 1.1
Mountain Hemlock

The historic climax plant community is comprised mostly of an overstory of Mountain hemlock. Other species that maybe present in the overstory are Shasta red fir, Western white pine, Lodgepole pine and subalpine fir. The understory is sparce and specie richness is very low. Only one plant makes up the shrub component of the understory, grouse huckleberry. Forbs/grasses makes up a very small percentage of the remaining ground cover.

Forest overstory. At maturity Mountain hemlock dominates the overstory.

Forest understory. The typical annual production of the understory species to a height of 4.5 feet (excluding boles of trees) under low, high, and representative canopy covers. The understory composition is in "percent canopy

cover." A "0" is used to show less than 1 percent canopy.

Table 5. Ground cover

Tree foliar cover	30-40%
Shrub/vine/liana foliar cover	12-17%
Grass/grasslike foliar cover	0-1%
Forb foliar cover	0-1%
Non-vascular plants	0%
Biological crusts	0%
Litter	20-30%
Surface fragments >0.25" and <=3"	10-15%
Surface fragments >3"	1-5%
Bedrock	0%
Water	0%
Bare ground	10-15%

Table 6. Soil surface cover

Tree basal cover	0%
Shrub/vine/liana basal cover	0%
Grass/grasslike basal cover	0-1%
Forb basal cover	0-1%
Non-vascular plants	0%
Biological crusts	0%
Litter	50-60%
Surface fragments >0.25" and <=3"	10-15%
Surface fragments >3"	1-5%
Bedrock	0%
Water	0%
Bare ground	10-15%

Table 7. Canopy structure (% cover)

Height Above Ground (Ft)	Tree	Shrub/Vine	Grass/ Grasslike	Forb
<0.5	–	–	0-1%	0-2%
>0.5 <= 1	0-1%	10-15%	–	–
>1 <= 2	0-1%	1-5%	–	–
>2 <= 4.5	0-1%	–	–	–
>4.5 <= 13	1-3%	–	–	–
>13 <= 40	1-3%	–	–	–
>40 <= 80	35-45%	–	–	–
>80 <= 120	–	–	–	–
>120	–	–	–	–

State 2

Shasta Red Fir

Community 2.1
Shasta Red Fir

Shasta red fir is a seral plant community that occurs when some disturbance negatively effects the mountain hemlock allowing shasta red fir to become dominant in the overstory or on a successional path from the lodgepole pine plant community to mountain hemlock plant community.

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

Forest understory. The typical annual production of the understory species to a height of 4.5 feet (excluding boles of trees) under low, high, and representative canopy covers. A "0" shows a canopy cover of less than 1%.

Table 8. Ground cover

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

Table 9. Soil surface cover

Tree basal cover	0%
Shrub/vine/liana basal cover	0-1%
Grass/grasslike basal cover	0-1%
Forb basal cover	0-1%
Non-vascular plants	0%
Biological crusts	0%
Litter	40-50%
Surface fragments >0.25" and <=3"	1-5%
Surface fragments >3"	0%
Bedrock	0%
Water	0%
Bare ground	15-20%

Table 10. Canopy structure (% cover)

Height Above Ground (Ft)	Tree	Shrub/Vine	Grass/ Grasslike	Forb
<0.5	–	0-1%	2-4%	1-3%
>0.5 <= 1	–	–	0-1%	–
>1 <= 2	0-1%	–	–	–
>2 <= 4.5	0-1%	–	–	–
>4.5 <= 13	–	–	–	–
>13 <= 40	0-2%	–	–	–
>40 <= 80	30-40%	–	–	–
>80 <= 120	1-3%	–	–	–
>120	–	–	–	–

State 3
Lodgepole Pine

Community 3.1
Lodgepole Pine

The Lodgepole pine plant community develops after a severe disurtance occurs in the Mountain hemlock or Shasta red fir plant communities. The primary disturbance factor is a stand replacement fire (SRF). Generally all trees are killed in a SRF fire. Lodgepole is recognized as a pioneer tree specie and it easily establishes after a fire.

Forest overstory. The typical forest overtory composition for the Lodgepole pine community.

Forest understory. The typical annual production of the understory species to a height of 4.5 feet (excluding boles of trees) under low, high, and representative canopy covers.

Numbers shown are "percent canopy cover". A "0" is present when canopy cover is less than 1 percent.

Table 11. Ground cover

Tree foliar cover	25-30%
Shrub/vine/liana foliar cover	0%
Grass/grasslike foliar cover	0-2%
Forb foliar cover	0%
Non-vascular plants	0%
Biological crusts	0%
Litter	15-20%
Surface fragments >0.25" and <=3"	5-10%
Surface fragments >3"	2-5%
Bedrock	0%
Water	0%
Bare ground	25-35%

Table 12. Soil surface cover

Tree basal cover	0%
Shrub/vine/liana basal cover	0%
Grass/grasslike basal cover	0-1%

Forb basal cover	0%
Non-vascular plants	0%
Biological crusts	0%
Litter	20-25%
Surface fragments >0.25" and <=3"	15-30%
Surface fragments >3"	0-5%
Bedrock	0%
Water	0%
Bare ground	40-50%

Table 13. Canopy structure (% cover)

Height Above Ground (Ft)	Tree	Shrub/Vine	Grass/ Grasslike	Forb
<0.5	–	–	0-2%	–
>0.5 <= 1	0-1%	–	–	–
>1 <= 2	0-1%	–	–	–
>2 <= 4.5	0-1%	–	–	–
>4.5 <= 13	0-1%	–	–	–
>13 <= 40	3-5%	–	–	–
>40 <= 80	20-30%	–	–	–
>80 <= 120	–	–	–	–
>120	–	–	–	–

Additional community tables

Contributors

C Ziegler

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	
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:**