

# Ecological site F006XY707OR East Crater Lake Stratovolcano Slopes

Accessed: 02/09/2025

## 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.

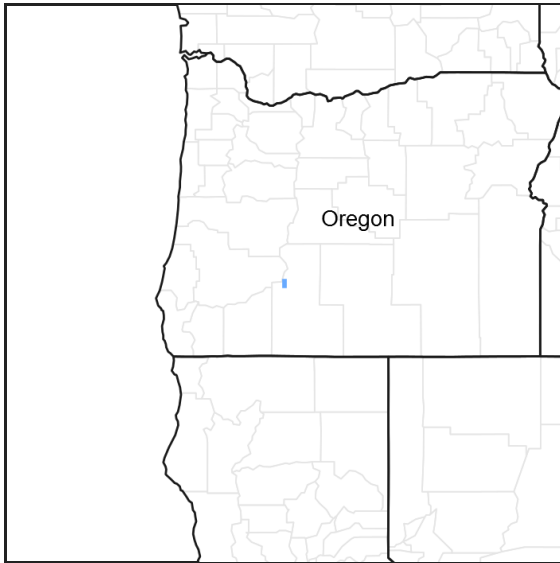


Figure 1. Mapped extent

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>Pinus ponderosa</i>
Shrub	(1) <i>Ceanothus velutinus</i>
Herbaceous	(1) <i>Carex inops</i>

## Physiographic features

This site is found on deep, well drained, moderately sloping soils that formed from ash deposits and lava flows.

Table 2. Representative physiographic features

Landforms	(1) Ash flow
Flooding frequency	None
Ponding frequency	None
Elevation	5,200–6,000 ft
Slope	0–35%
Water table depth	60 in
Aspect	Aspect is not a significant factor

## Climatic features

Winter are long, cold and snowy. Snow makes up a large amount of the effective precipitation. Summers days are warm, and nights are cool. Summer precipitation comes as infreqesnt rain storms. Summer thunderstorms can drop moderately heavy amounts of rain, but only for a short period of time.

**Table 3. Representative climatic features**

Frost-free period (average)	80 days
Freeze-free period (average)	107 days
Precipitation total (average)	30 in

## Influencing water features

None

## Soil features

This site is found on soils formed in andesite lava flows and air fall pumice and ash deposits.

**Table 4. Representative soil features**

Surface texture	(1) Paragravelly loamy fine sand (2) Very gravelly loamy sand (3) Ashy loamy sand
Family particle size	(1) Sandy
Drainage class	Somewhat excessively drained to excessively drained
Permeability class	Rapid to very rapid
Soil depth	60 in
Surface fragment cover <=3"	0–35%
Surface fragment cover >3"	0–15%
Available water capacity (0-40in)	4.8–9 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)	5.1–7.3
Subsurface fragment volume <=3" (Depth not specified)	10–50%
Subsurface fragment volume >3" (Depth not specified)	0–40%

## Ecological dynamics

The historic climax plant community has an overstory made up of mostly of Ponderosa pine with some White fir. Fire is the major influencing factor that maintained Ponderosa as the dominant tree specie.

Fire return intervals have been shown to be approximately 10 to 40 years. This return interval favors Ponderosa pine since it can withstand low and moderate severity fires. White fir survives in areas where fire does not readily burn (rock outcrops) or where fire severity is low.

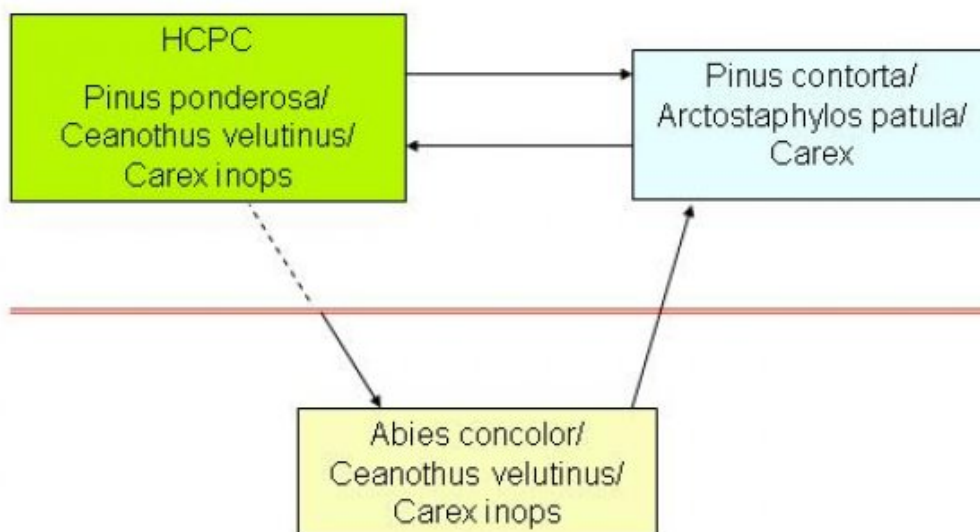
Fire exclusion benefits White fir. It easily regenerates under shade. Extended periods of fire exclusion will allow white fir to grow up into and take a dominant position in the canopy. With increased canopy cover and litter cover Ponderosa pine does not regenerate. The percentage of pine in the stand will decline over time.

The understory vegetation composition changes only slightly until the canopy cover closes in. When this happens vegetation cover decreases. Rock outcrop areas remain better vegetated.

Fire exclusion allows for the build up of large amounts of fuels on the forest floor, increasing the potential for a stand replacement fire. When one occurs all vegetation is usually consumed. Lodgepole pine (a pioneer specie) is usually the first tree specie to re-establish on the site.

Stocking can be light to very heavy. Heavy to very heavily stocked stands become susceptible to mountain pine beetle infestations as the stand matures. Beetle out-breaks usually kill all trees. After the out-break, either lodgepole regenerates or if a seed source of pine or fir is available then other seedlings could regenerate.

## State and transition model



**State 1**  
**Ponderosa pine Plant Community**

**Community 1.1**  
**Ponderosa pine Plant Community**

The Ponderosa pine plant community is the fire influenced plant community or historic climax plant community (HCPC). Ponderosa pine dominates the overstory with small amounts of White fir scattered throughout. The fir establishes where fire cannot repeatedly burns. These areas are mostly where rockout croppings exist. The ground vegetation and litter layer are broken up so fire can not easily burn the trees and shrubs within the rockout crops. With frequent fires, vegetation that sprouts from rhizomes or root collars will be most prevalent. Those species are snowbrush ceanothus, greenleaf manzanita, longstolon sedge and needlegrass.

**Forest overstory.** The typical overstory composition for the Ponderosa pine 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.

Plant composition is expressed as "percent canopy cover". Species listed as "0" percent are present at less than 1 percent canopy cover.

**Table 5. Ground cover**

Tree foliar cover	20-25%
Shrub/vine/liana foliar cover	15-20%
Grass/grasslike foliar cover	5-10%
Forb foliar cover	0%
Non-vascular plants	0%
Biological crusts	0%
Litter	20-25%
Surface fragments >0.25" and <=3"	3-8%
Surface fragments >3"	1-2%
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	1-3%
Forb basal cover	0%
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	–	–	–	–
>0.5 <= 1	–	–	10-15%	–
>1 <= 2	0-1%	–	8-10%	–
>2 <= 4.5	0-1%	20-25%	–	–
>4.5 <= 13	0-1%	–	–	–
>13 <= 40	1-5%	–	–	–
>40 <= 80	15-20%	–	–	–
>80 <= 120	5-10%	–	–	–
>120	–	–	–	–

## State 2

### White fir plant community

#### Community 2.1

#### White fir plant community

Fire exclusion allows white fir to increase its presence in the site. It readily regenerates under shade and will continue to regenerate under its own shade. The fir will grow up into the canopy and, over time, crowd out the the pine. White fir will continue to dominate and Ponderosa pine will continue to decline. Once the threshold has been crossed returning to the HCPC can not be without some type of disturbance (fire, harvesting, replanting, etc.)

**Forest overstory.** The typical overstory composition for the White 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.

Plant composition is expressed as "percent canopy cover". Species listed as "0" percent are present at less than 1 percent canopy cover.

**Table 8. Ground cover**

Tree foliar cover	40-50%
Shrub/vine/liana foliar cover	5-10%
Grass/grasslike foliar cover	5-10%
Forb foliar cover	0-1%
Non-vascular plants	0%
Biological crusts	0%
Litter	20-30%
Surface fragments >0.25" and <=3"	0-1%
Surface fragments >3"	0%
Bedrock	0%
Water	0%
Bare ground	5-10%

**Table 9. Soil surface cover**

Tree basal cover	0%
Shrub/vine/liana basal cover	0%

Grass/grasslike basal cover	1-3%
Forb basal cover	0-1%
Non-vascular plants	0%
Biological crusts	0%
Litter	80-90%
Surface fragments >0.25" and <=3"	1-5%
Surface fragments >3"	0%
Bedrock	0%
Water	0%
Bare ground	0%

**Table 10. Canopy structure (% cover)**

Height Above Ground (Ft)	Tree	Shrub/Vine	Grass/ Grasslike	Forb
<0.5	–	–	–	0-1%
>0.5 <= 1	–	–	10-15%	–
>1 <= 2	–	–	–	–
>2 <= 4.5	0-1%	15-20%	–	–
>4.5 <= 13	1-3%	–	–	–
>13 <= 40	5-10%	–	–	–
>40 <= 80	8-12%	–	–	–
>80 <= 120	40-45%	–	–	–
>120	3-8%	–	–	–

### State 3

#### Lodgepole pine plant community

##### Community 3.1

#### Lodgepole pine plant community

Lodgepole pine establishes after a stand replacement fire. It is the only specie in the overstory. Overtime the understory vegetation has recovered.

**Forest overstory.** The typical overstory composition of the Lodgepole 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.

Plant composition is expressed as "percent canopy cover". Species listed as "0" percent are present at less than 1 percent canopy cover.

**Table 11. Ground cover**

Tree foliar cover	25-35%
Shrub/vine/liana foliar cover	10-15%
Grass/grasslike foliar cover	5-10%
Forb foliar cover	0%
Non-vascular plants	0%
Biological crusts	0%

Litter	15-25%
Surface fragments >0.25" and <=3"	1-5%
Surface fragments >3"	1-2%
Bedrock	0%
Water	0%
Bare ground	10-20%

**Table 12. Soil surface cover**

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

**Table 13. Canopy structure (% cover)**

Height Above Ground (Ft)	Tree	Shrub/Vine	Grass/ Grasslike	Forb
<0.5	–	–	1-3%	–
>0.5 <= 1	–	–	15-20%	–
>1 <= 2	–	–	–	–
>2 <= 4.5	1-3%	15-20%	–	–
>4.5 <= 13	1-5%	–	–	–
>13 <= 40	5-10%	–	–	–
>40 <= 80	30-35%	–	–	–
>80 <= 120	1-2%	–	–	–
>120	–	–	–	–

## Additional community tables

### Type locality

Location 1: Klamath County, OR	
General legal description	Site description taken northeastern portion of Crater Lake National Park

### Contributors

Craig 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:**
-