# Rapid Assessment Reference Condition Model

*The Rapid Assessment is a component of the LANDFIRE project. Reference condition models for the Rapid Assessment were created through a series of expert workshops and a peer-review process in 2004-2005. For more information, please visit www.landfire.gov. Please direct questions to helpdesk@landfire.gov.*

## *Potential Natural Vegetation Group (PNVG):*

**R#ABLA** **Subalpine Fir**

## *General Information*

**Contributors** *(additional contributors may be listed under "Model Evolution and Comments")*


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**Vegetation Type**

Forested

**Dominant Species***

ABLA
PICO
PSME

**General Model Sources**

- [x] Literature
- [ ] Local Data
- [x] Expert Estimate

**LANDFIRE Mapping Zones**

1 8
2 9
7

**Rapid Assessment Model Zones**

- [ ] California
- [ ] Great Basin
- [ ] Great Lakes
- [ ] Northeast
- [ ] Northern Plains
- [ ] N-Cent.Rockies
- [x] Pacific Northwest
- [ ] South Central
- [ ] Southeast
- [ ] S. Appalachians
- [ ] Southwest

### Geographic Range

Subalpine fir occurs on the east-side of the Olympic Peninsula and in drier slopes of the Washington and Oregon Cascades.

### Biophysical Site Description

This PNVG is found in the subalpine (4000 to 6200 feet) in areas that experience cold winters and warm, dry summers. The precipitation ranges from 100 - 200 cm.

### Vegetation Description

Subalpine fir is the dominant species in this PNVG. It occurs with Lodgepole pine and Douglas-fir. Pacific silver fir and Mountain hemlock are also present in many stands; Alaska yellow-cedar may be present in WA, but less so further south, where mountain. hemlock may be more significant. The understory vegetation includes a light cover of heath shrubs (Vaccinium species and heathers), alpine grasses and sedges.

### Disturbance Description

Fires in this PNVG are typically stand replacing events that occur at approximately 200 year intervals. Avalanches and wind are secondary disturbance factors in this PNVG, but were not explicitly modeled.

Mixed fire occurs in all mid and late vegetation classes of this type. In all cases, the mixed fires both contribute to the area that is reset to post-replacement, and the mixed fires recycle some of the class back into itself.

### Adjacency or Identification Concerns

This PNVG replaces the Pacific silver fir and Mountain hemlock types in warmer and drier areas. It occurs

*Dominant and Indicator Species are from the NRCS PLANTS database. To check a species code, please visit http://plants.usda.gov.

below the subalpine meadows and above the Western hemlock zone. Further east, in the Blue and Ochoco mountains, the spruce-fir model may take its place.

**Sources of Scale Data** ☑ Literature ☐ Local Data ☑ Expert Estimate

### Scale Description

Fire in this PNVG creates patches that are typically on the scale of 100's of acres, although 1000's of acres can also burn within a single event. The proximity to the timberline and glaciers often prevents the larger scale burns.

### Issues/Problems

The fire regime can be either a IV or V (MFI averaging 150 years).

### Model Evolution and Comments

The mid and late seral stages described below appear to reflect landscapes that could be continuous forest, but this PNVG can be particularly clumpy due to patches of barren ground and alpine meadows, etc.

## *Succession Classes*

*Succession classes are the equivalent of "Vegetation Fuel Classes" as defined in the Interagency FRCC Guidebook (www.frcc.gov).*

### *Class A* 15 %

Early1 PostRep

**Description**

Early succession in the subalpine forests begins with meadows dominated by heathers (e.g. Phyllodoce empetriformis) and vacciniums (e.g. Vaccinium membranaceum) and scattered seedlings and saplings that are less than 2" dbh.

**Indicator Species* and Canopy Position**

PHEM
VAME
PICO
PSME

**Upper Layer Lifeform**

☐ Herbaceous
☐ Shrub
☐ Tree

**Fuel Model** no data

**Structure Data (for upper layer lifeform)**

| | Min | Max |
|---|---|---|
| *Cover* | 0 % | 30 % |
| *Height* | no data | no data |
| *Tree Size Class* | no data | |

☐ Upper layer lifeform differs from dominant lifeform. Height and cover of dominant lifeform are:

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### *Class B* 20 %

Mid1 Closed

**Description**

Early successional species continue to dominate the middle-aged stand, and subalpine fir fills in the canopy. Trees in this middle-age stand are typically less than 20" diameter.

**Indicator Species* and Canopy Position**

PICO
PSME

ABLA

**Upper Layer Lifeform**

☐ Herbaceous
☐ Shrub
☐ Tree

**Fuel Model** no data

**Structure Data (for upper layer lifeform)**

| | Min | Max |
|---|---|---|
| *Cover* | 30 % | 80 % |
| *Height* | no data | no data |
| *Tree Size Class* | no data | |

☐ Upper layer lifeform differs from dominant lifeform. Height and cover of dominant lifeform are:

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### *Class C* 2 %

Mid1 Open

**Description**

Mixed-severity fire kills subalpine fir and Lodgepole pine. Lodgepole pine quickly returns to the understory along with shrubs. Trees in this class are less than 20" in diameter.

**Indicator Species* and Canopy Position**

PSME
VAME
PHEM
PICO

**Upper Layer Lifeform**

☐ Herbaceous
☐ Shrub
☐ Tree

**Fuel Model** no data

**Structure Data (for upper layer lifeform)**

| | Min | Max |
|---|---|---|
| *Cover* | 10 % | 30 % |
| *Height* | no data | no data |
| *Tree Size Class* | no data | |

☐ Upper layer lifeform differs from dominant lifeform. Height and cover of dominant lifeform are:

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### *Class D* 3 %

Late1 Open

**Description**

Mixed-severity fire kills fire intolerant species, opening the stand up substantially. The remaining trees average 30" in diameter.

**Indicator Species* and Canopy Position**

PSME
VAME
PHEM
PICO

**Upper Layer Lifeform**

☐ Herbaceous
☐ Shrub
☐ Tree

**Fuel Model** no data

**Structure Data (for upper layer lifeform)**

| | Min | Max |
|---|---|---|
| *Cover* | 10 % | 30 % |
| *Height* | no data | no data |
| *Tree Size Class* | no data | |

☐ Upper layer lifeform differs from dominant lifeform. Height and cover of dominant lifeform are:

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### *Class E* 60 %

Late1 Closed

**Description**

Subalpine fir and other subalpine trees dominate the late successional stand. Trees in the forest type with trees that average 30" in diameter and range from 10" to 70".

**Indicator Species* and Canopy Position**

ABLA
TSME
ABAM
CHNO

**Upper Layer Lifeform**

☐ Herbaceous
☐ Shrub
☐ Tree

**Fuel Model** no data

**Structure Data (for upper layer lifeform)**

| | Min | Max |
|---|---|---|
| *Cover* | 30 % | 80 % |
| *Height* | no data | no data |
| *Tree Size Class* | no data | |

☐ Upper layer lifeform differs from dominant lifeform. Height and cover of dominant lifeform are:

## *Disturbances*

**Non-Fire Disturbances Modeled**

☐ Insects/Disease
☐ Wind/Weather/Stress
☐ Native Grazing
☐ Competition
☐ Other:
☐ Other:

**Fire Regime Group:** 4

I: 0-35 year frequency, low and mixed severity
II: 0-35 year frequency, replacement severity
III: 35-200 year frequency, low and mixed severity
IV: 35-200 year frequency, replacement severity
V: 200+ year frequency, replacement severity

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**Historical Fire Size (acres)**

Avg:

Min:

Max:

***Fire Intervals (FI):***

Fire interval is expressed in years for each fire severity class and for all types of fire combined (All Fires). Average FI is the central tendency modeled. Minimum and maximum show the relative range of fire intervals, if known. Probability is the inverse of fire interval in years and is used in reference condition modeling. Percent of all fires is the percent of all fires in that severity class. All values are estimates and not precise.

**Sources of Fire Regime Data**

- [x] Literature
- [ ] Local Data
- [x] Expert Estimate

| | *Avg FI* | *Min FI* | *Max FI* | *Probability* | *Percent of All Fires* |
|---|---|---|---|---|---|
| *Replacement* | 185 | 150 | 300 | 0.00541 | 81 |
| *Mixed* | 800 | 500 | 1000 | 0.00125 | 19 |
| *Surface* | | | | | |
| *All Fires* | 150 | | | 0.00667 | |

## *References*


Agee, James K. 1993. Fire ecology of Pacific Northwest Forests. Island Press, Washington DC.

Diaz, N.M.; High, C.T.; Mellen, T.K.; Smith, D.E.; Topik, C. 1997. Plant association and management guide for the mountain hemlock zone. R6-MTH-GP-TP-08-95. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Region. [irregular pagination]

Fonda and Bliss 1969. Ecological Monographs 39:271-301.

Hemstrom, M.A. 1979. A recent disturbance history of forest ecosystems at Mount Rainier National Park. Ph.D. diss., Oregon State University, Corvallis, OR.

Henderson, J.A.; Peter, D.M.; Lesher, R.D.; Shaw, D.C. 1989. Forested plant associations of the Olympic National Forest. R6-ECOL-TP-001-88. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Region. . 502 p.

Henderson, J.A.; Lesher, R.D.; Peter, D.H.; Shaw, D.C. 1992. Field guide to the forested plant associations of the Mt. Baker-Snoqualmie National Forests. R6-ECOL-TP-028-91. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Region. 196 p.

Williams, C.K.; Lillybridge, T.R. 1983. Forested plant associations of the Okanogan National Forest. R6-ECOL-132b-1983. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Region. 140 p.