

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 and 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")

Modelers

Karen Kopper karen_kopper@nps.gov
Steve Acker steve_acker@nps.gov

Reviewers

Louisa Evers Louisa_Evers@or.blm.gov

Vegetation Type

Forested

General Model Sources

- Literature
 Local Data
 Expert Estimate

Rapid Assessment Model Zones

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

Dominant Species*

ABLA
PICO
PSME

LANDFIRE Mapping Zones

1 8
2 9
7

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 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.

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

Scale Description

Sources of Scale Data Literature Local Data Expert Estimate

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.

Dominant 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:

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.

Dominant 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:

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

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.

Dominant 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:

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.

Dominant 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:

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".

Dominant 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

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

Disturbances Modeled

- Fire
- Insects/Disease
- Wind/Weather/Stress
- Native Grazing
- Competition
- Other:
- Other

Historical Fire Size (acres)

Avg: no data
 Min: no data
 Max: no data

Sources of Fire Regime Data

- Literature
- Local Data
- Expert Estimate

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

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 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.

	<i>Avg FI</i>	<i>Min FI</i>	<i>Max FI</i>	<i>Probability</i>	<i>Percent of All Fires</i>
<i>Replacement</i>	185	150	300	0.00541	81
<i>Mixed</i>	800	500	1000	0.00125	19
<i>Surface</i>					
<i>All Fires</i>	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.; Leshner, 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.; Leshner, 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.

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