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#ABAMlw **Pacific Silver Fir--Low Elevation**

General Information

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

Modelers		Reviewers	
Karen Kopper	karen_kopper@nps.gov	Miles Hemstrom	mhemstrom@fs.fed.us
Jane Kertis	jkertis@fs.fed.us		

Vegetation Type

Forested

Dominant Species*

ABAM
TSHE
PSME
ABPR

General Model Sources

- [x] Literature
- [x] 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

The Pacific Silver fir PNVG occurs on the western slopes of the Cascades from British Columbia south to the Rogue and Umpqua River divide in the Southern Cascades. It can occur east of the Cascades crest south of Mt. Hood. This low elevation type (with a mixed-severity regime) is also found throughout the Ross Lake Drainage and on the eastern slopes of the North Cascades.

Biophysical Site Description

The Pacific Silver fir forests described in this PNVG occur at lower elevations within the Pacific Silver fir zone (450 - 800 meters in the north, 1600 - 1800 meters in the south). Pacific silver fir grows on soils developed from nearly every type of parent material found in the Northwest. Growth rates for Pacific silver fir are greatest at low elevations on fine-textured residual soils from sedimentary and basaltic rocks.

Vegetation Description

Pacific Silver fir is the dominant and climax tree species in the mature canopy, which it shares with a wide-variety of conifers depending upon locale. Douglas-fir and western hemlock are codominant throughout the range. Subalpine fir, Grand fir, White pine and Englemann spruce are common around Mount Adams and in parts of Oregon. Noble fir is commonly associated to the PNVG from Mount Rainier and south, and Lodgepole pine is common in the North Cascades. The understory is predominantly composed of a lush to moderate layer (depending upon the amount of moisture) of heath shrubs, forbs, ferns and mosses.

Disturbance Description

Pacific Silver fir forests in this PNVG are characterized by infrequent mixed severity fire regimes occurring at greater than 100 years. These fires produced variably sized patches throughout the landscape. Landscapes were reset at intervals greater than 200 years through stand-replacing events. Avalanches and wind events are also common disturbances in this PNVG.

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

Adjacency or Identification Concerns

The Pacific Silver fir PNVG occurs above the Western hemlock forests. This low elevation type is replaced by moister and cooler plant associations (Silver fir - Mountain hemlock) at higher elevations. This PNVG is distinguished from the high elevation Pacific Silver Fir type (R#ABAMup) by elevation breaks: the low elevation type occurs below 800m in the north and 1800m in the south.

Scale Description

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

Mixed-severity fire events occur on the scale of 1000's of acres, and are usually stand-replacing. Infrequent avalanches and wind disturbances also occur in this PNVG, but these disturbances more frequently occur at scales of 10's and 100"s of acres.

Issues/Problems

Although windthrow and avalanches are known disturbances in this PNVG, the nature of these disturbances are based upon opinion only, and should be checked for validity. These disturbances were not modeled explicitly.

Model Evolution and Comments

Probability of mixed severity events was reduced (from 0.003 to 0.0025) during peer review and had negligible effect on the percentages in each class, but raised the fire return of 'All fire' from 111 to 146 years. (Component fire Interval values differed, too: Replacement fire from 300 to 350; and mixed fire from 175 to 250).

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 All Structures

Description

The early seral stand consists of low heath shrubs, seedlings and saplings. Sometimes, competition can keep the trees at no greater than 2" dbh. Silver fir is seral, however Douglas fir, western white pine and noble fir may also be seral, and, where they occur, they grow more quickly than silver fir. This stage can last for decades (up to 40 years). [A replacement fire sets the stand back forty years and occurs about every 300-350 years.]

Indicator Species* and Canopy Position

PSME
ABPR
PIMO3
ABAM

Upper Layer Lifeform

☐ Herbaceous
☐ Shrub
☐ Tree

Fuel Model no data

Structure Data (for upper layer lifeform)

	Min	*Max*
Cover	0 %	60 %
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 and Indicator Species are from the NRCS PLANTS database. To check a species code, please visit http://plants.usda.gov.

Class B 20 %

Mid1 Closed

Description

Canopy closure occurs in the middle-aged stand. Trees grow to 20" dbh. The early seral species continue to dominate the stand, and the midstory fills in with increasingly larger amounts of Pacific Silver fir and a variety of more shade tolerant conifers (Engelmann spruce, western hemlock, western red cedar). [After 80 years in this class it would proceed to class E. Mixed fire has equal probability (~300-350 years for each type) to move this class to C (mid-open) as to making no change (stays in B). Replacement fire may also occur at the same probability.]

Indicator Species* and Canopy Position

ABAM
PSME
PIMO3
ABPR

Upper Layer Lifeform

☐ Herbaceous
☐ Shrub
☐ Tree

Fuel Model no data

Structure Data (for upper layer lifeform)

	Min	*Max*
Cover	60 %	100 %
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 C 3 %

Mid1 Open

Description

Openings in the canopy are created by mixed severity fire [about every 300-350 years and maintains it in Class C]. Fire resistant Douglas-fir and Western white pine remain. They continue to grow to 20" dbh. Lodgepole pine (where it occurs) and Silver fir regenerate in the openings as the stand fills back in. [After 80 in this class it proceeds to Class E. Replacement fire about every 300-350 years.]

Indicator Species* and Canopy Position

PSME
PIMO3
ABAM
PICO

Upper Layer Lifeform

☐ Herbaceous
☐ Shrub
☐ Tree

Fuel Model no data

Structure Data (for upper layer lifeform)

	Min	*Max*
Cover	20 %	60 %
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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*Dominant and Indicator Species are from the NRCS PLANTS database. To check a species code, please visit http://plants.usda.gov.

Class D 10 %

Late1 Open

Description

Douglas fir is resistant to mixed severity fire events. The overstory trees average 45" dbh. Silver fir and western hemlock regenerate in the understory. [After 50 years in this class it fills in to become class E. However, mixed fire can maintain it in D (300-350 years), and replacement fire may occur at the same frequency.]

Indicator Species* and Canopy Position

PSME
ABAM
TSHE

Upper Layer Lifeform

☐ Herbaceous
☐ Shrub
☐ Tree

Fuel Model no data

Structure Data (for upper layer lifeform)

	Min	*Max*
Cover	20 %	60 %
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 52 %

Late1 Closed

Description

Silver fir is dominant in the late seral stand. The trees average 45" dbh, and range from 21" - 150" dbh. Douglas fir and Western hemlock are codominant. [Fire and Insect/disease occur in these old stands. Mixed fire could maintain the closed stand or move the stand to open-late (class D) - each occurs about every 300-350 years. Similarly, Insect/disease could either replace the stand (class A), or open it up to class D but at a low frequency (about every 1000 years.)]

Indicator Species* and Canopy Position

ABAM
PSME
TSHE

Upper Layer Lifeform

☐ Herbaceous
☐ Shrub
☐ Tree

Fuel Model no data

Structure Data (for upper layer lifeform)

	Min	*Max*
Cover	60 %	100 %
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: 3

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	350	100	800	0.00286	46
Mixed	300	100	400	0.00333	54
Surface					
All Fires	162			0.00620	

References

Agee, James K. 1993. Fire Ecology of Pacific Northwest Forests. Island Press

Franklin, Jerry F. and C. T. Dyrness 1988. Natural Vegetation of Oregon and Washington. Oregon State University Press

Hemstrom, Miles Arthur 1979. A recent disturbance history of forest ecosystems at Mount Rainier National Park. Phd dissertation. Oregon State University.

Hemstrom, M.A., S.E. Logan, and W. Pavlat. 1987. Plant association and management guide, Willamette National Forest. Publication R6-Ecol-257b-1986. USDA Forest Service, Pacific Northwest Region, Portland, OR. 312 p.

Lillybridge, T.R.; Kovalchik, B.L.; Williams, C.K.; Smith, B.G. 1995. Field guide for forested plant associations of the Wenatchee National Forest. PNW-GTR-359. Portland, OR: USDA Forest Service, Pacific Northwest Research Sation. 337p.