

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#SPFI Spruce - Fir

General Information

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

Modelers

Miles Hemstrom mhemstrom@fs.fed.us

Ed Uebler euebler@fs.fed.us

Bill McArthur wmcArthur@fs.fed.us

Reviewers

Dave Swanson dkswanson@fs.fed.us

Tony Svejcar tony.svejcar@oregonstate.edu

Vegetation Type

Forested

Dominant Species*

PICO

ABLA

PIEN

ABGR

General Model Sources

Literature

Local Data

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

Pacific Northwest

South Central

Southeast

S. Appalachians

Southwest

Geographic Range

Eastside Oregon and Washington Cascades, Blue Mountains of Washington, Blue and Ochoco Mountains in Oregon.

Biophysical Site Description

This forest type occurs at upper elevations, on cold sites with deep snow and frosty growing seasons.

Vegetation Description

Lodgepole pine often serves as a nurse crop for spruce and fir in early succession. Some sites take a very long time to regenerate following reburn fires. Dense stands of lodgepole can develop and survive for 100+ years. Old stands of Engelmann spruce and subalpine fir can develop, but are prone to insect and fire replacement.

Disturbance Description

Wildfires are less frequent than at lower elevations. Most fires are mixed severity or stand replacement severity. Insects play significant roles at both endemic and epidemic/outbreak levels.

Adjacency or Identification Concerns

Sub-alpine woodland occurs above this type.

This PNVG may be similar to the PNVG R0SPFI from the Northern Central Rockies model zone.

Scale Description

Sources of Scale Data Literature Local Data Expert Estimate

Stands often occur as large patches on upper slopes and break into stringers or islands as elevation nears tree line.

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

Issues/Problems

Using Class B as the standard post-replacement structure leaves class A to be the non-standard, very slow to re-establish class.

Limitation to 5 boxes caused us some problems with this model. We wanted to show an early seral open condition that is persistent and fills in very slowly with conifers following a reburn of young stands. This is our box A (early1 open). Consequently, we did not include a late open condition because this seems to be relatively less common except as you begin to leave closed forests near the transition to alpine woodland. Given our cover breaks for closed versus open, we figured most late structure would also have over 40% canopy cover. We used many of the probabilities and disturbances from the original FRCC SPFI1 model, after checking them for validity for our region. We did think that insect and disease events are more common in our area than in the original FRCC SPFI1 model.

Model Evolution and Comments

Succession Classes

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

Class A	3%	Indicator Species* and Canopy Position	Structure Data (for upper layer lifeform)
Early1 Open		PICO	
Description		VASC	
Openings and meadows following stand replacement fire. Very poorly stocked with mostly lodgepole pine. Slow to fill in with lodgepole pine, frosty, lots of shrubs. Trees 0-5" DBH.		VAME	
Dominant understory species include grouse whortleberry, big huckleberry, bromes, and sedges.		BROMU	
		Upper Layer Lifeform	<input type="checkbox"/> Upper layer lifeform differs from dominant lifeform. Height and cover of dominant lifeform are:
		<input type="checkbox"/> Herbaceous	
		<input type="checkbox"/> Shrub	
		<input type="checkbox"/> Tree	
		Fuel Model no data	
<hr/>			
Class B	22%	Indicator Species* and Canopy Position	Structure Data (for upper layer lifeform)
Early1 Closed		PICO	
Description			
Young lodgepole pine stand that regenerated from stored seed following stand replacement fire or insects. Trees 0-5" DBH.			
		Upper Layer Lifeform	<input type="checkbox"/> Upper layer lifeform differs from dominant lifeform. Height and cover of dominant lifeform are:
		<input type="checkbox"/> Herbaceous	
		<input type="checkbox"/> Shrub	
		<input type="checkbox"/> Tree	
		Fuel Model no data	

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Class C 25%

Mid1 Closed

Description

Mid-sized lodgepole stand, closed canopy. Eventually, a few subalpine fir and Engelmann spruce begin to show. Trees 6-15" DBH.

Indicator Species* and Canopy Position

PICO
ABLA
PIEN
ABGR

Upper Layer Lifeform

- Herbaceous
- Shrub
- Tree

Fuel Model no data

Structure Data (for upper layer lifeform)

	Min	Max
Cover	40 %	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:

Class D 20%

Mid1 Open

Description

Mid-sized lodgepole pine, open canopy with some spruce and fir filling in. Trees 6-15" DBH. Dominant understory species include grouse whortleberry, big huckleberry, bromes, and sedges. Fools huckleberry occurs to the north.

Indicator Species* and Canopy Position

PICO
ABLA
PIEN
ABGR

Upper Layer Lifeform

- Herbaceous
- Shrub
- Tree

Fuel Model no data

Structure Data (for upper layer lifeform)

	Min	Max
Cover	10 %	40 %
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 30%

Late1 Closed

Description

Large, old, dense, Engelmann spruce and subalpine fir. Trees 15+" DBH.

Indicator Species* and Canopy Position

ABLA
PIEN
ABGR
NVEG

Upper Layer Lifeform

- Herbaceous
- Shrub
- Tree

Fuel Model no data

Structure Data (for upper layer lifeform)

	Min	Max
Cover	40 %	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

- Literature
- Local Data
- Expert Estimate

	Avg FI	Min FI	Max FI	Probability	Percent of All Fires
<i>Replacement</i>	135	80	270	0.00741	84
<i>Mixed</i>	700	285	10000	0.00143	16
<i>Surface</i>					
<i>All Fires</i>	113			0.00885	

References

Agee, James K. 1993. Fire ecology of Pacific Northwest forests. Washington, DC: Island Press. 493 p.

Crowe, E.; Clausnitzer, R. 1997. Mid-montane wetland plant associations of the Malheur, Umatilla and Wallowa-Whitman National Forests. R6-NR-ECOL-TP-22-97. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Region. 299 p.

Heyerdahl, Emily K. and James K. Agee. 1996. Historical fire regimes of four sites in the Blue Mountains, Oregon and Washington. Final Report, University of Washington, Seattle. 173 p.

Hopkins, W.E. 1979a. Plant associations of the Fremont National Forest. USDA Forest Service R6 Ecol 79-004. Pacific Northwest Region, Portland Oregon. 106 p., illus.

Hopkins, W.E. 1979b. Plant associations of the south Chiloquin and Klamath Ranger Districts, Winema National Forest. USDA Forest Service R6 Ecol 79-005. Pacific Northwest Region, Portland, Oregon. 96 p., illus

Johnson, C.G. and Clausnitzer, R.R. 1992. Plant associations of the Blue and Ochoco Mountains. P6-ERW-TP-036-92. Portland, OR: USDA Forest Service, Pacific Northwest Region. 164 pp + appendices.

Johnson, C.G. and Simon, S.A. 1986. Plant associations of the Wallowa-Snake province. R6-ECOL-TP-255b-86. Portland, OR: USDA Forest Service, Pacific Northwest Region. 272 pp + appendices.

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 Experiment Station. 337 p.

Mauroka, K.R. 1994. Fire history of *Pseudotsuga menziesii* and *Abies grandis* stands in the Blue Mountains of Oregon and Washington. M.S. Thesis, University of Washington, Seattle, WA. 73 p.

Volland, L.A. 1988. Plant communities of the central Oregon pumice zone. R-6 Area Guide 4-2. Portland, OR: USDA Forest Service, Pacific Northwest Region. 113 pp + appendices.

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