LANDFIRE Biophysical Setting Model

Biophysical Setting: 0710411 North Pacific Mountain Hemlock Forest - Wet

☐ *This BPS is lumped with:*

☑ *This BPS is split into multiple models: Wet and dry. Washington has two types in Mtn Hemlock. BpS 0710411 represents the wet variant. For the dry variant in WA, use the OR Model (BpS 0710412).*

General Information

Contributors (also see the Comments field) **Date** 3/16/2006

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Vegetation Type

Forest and Woodland

General Model Sources

☑ Literature
☑ Local Data
☑ Expert Estimate

Dominant Species

TSME
ABAM
CHNO
VACCI

Map Zone

7

Model Zone

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

Geographic Range

This type occupies some of the highest-elevation forested zones in the Northern Cascades and Olympic Mountains. This type is rare further south. It occurs in the Gifford Pinshot NF sporadically, and possibly in northern Oregon.

Biophysical Site Description

The lower elevation limit of the type ranges from about 3000ft in the Olympics, 3500ft in the Cascades and 3000ft on the east side of the Cascades. Sites are cold and characterized by deep (10-20ft) and persistent snowpacks and short growing seasons.

Vegetation Description

The late seral stands are co-dominated by mountain hemlock and silver fir,with occassional Alaska yellowcedar. Common understory species include Vaccinium alaskaense [aka V. ovalifolium], Menziesia ferruginea, Oplopanax horridum, Clintonia uniflora, Rubus pedatus, Blechnum spicant.

Disturbance Description

Most of the occurrence of fire in this type is single tree lightning strikes, especially on ridgelines, so the frequency of fire tends to be low. Estimates of the return of fire are over 1000yrs. It's hard to estimate fire return due to lack of evidence. Avalanches may be a more common disturbance than fire and they tend to repeat at the same locations. Avalanches can be initiated after fire. Heart-rots and butt-rots occur, but not at a stand scale.

Adjacency or Identification Concerns

The type is above the mesic-wet Pacific silver fir type, and below subalpine parkland.

**Fire Regime Groups are: I: 0-35 year frequency, surface severity; II: 0-35 year frequency, replacement severity; III: 35-100+ year frequency, mixed severity; IV: 35-100+ year frequency, replacement severity; V: 200+ year frequency, replacement severity.

Native Uncharacteristic Conditions

Scale Description

In areas of continuous forest, fire sizes can range from 10s to 100s of acres.

Issues/Problems

There is little to no evidence of fire in this type, so estimations of fire return are difficult to gauge. The current cohort established under a different climate.

Comments

During model review, Foster ran a model with replacement MFRI=1500yrs and mixed MFRI=500yrs. The changes were to have only 75% of the landsscape in Class E, 10% in Class D and 5% in Class A.

9/27/07: As a result of final QC for LANDFIRE National by Kori Blankenship the user-defined min and max fire return intervals for replacement severity fire were deleted because they were not consistent with the modeled fire return interval for this fire severity type.

Vegetation Classes

Class A 1 %

Early Development 1 All Structure

Upper Layer Lifeform

- ☐ Herbaceous
- ☐ Shrub
- ☑ Tree

Fuel Model

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Indicator Species and Canopy Position

TSME
Upper
ABAM
Upper
VACCI
Low-Mid

Structure Data (for upper layer lifeform)

	Min	Max
Cover	0 %	100 %
Height	Tree 0m	Tree 10m
Tree Size Class	Pole 5-9" DBH	

☑ Upper layer lifeform differs from dominant lifeform.

The shrub layer is dominant. The minimum height is 0.5ft, and the maximum height is 6ft. The canopy cover ranges from 0-90%.

Description

The first few years following stand-replacing wildfire are characterized by bare ground, herbs, shrubs, and varying densities of tree seedlings (presumably dependent on seed sources). Dominant species include pacific silver fir and mountain hemlock. [Succession to class B after 100yrs. Replacement fire (MFRI about 10,000yrs) sets it back.]

Class B 5 %

Mid Development 1 Closed

Upper Layer Lifeform

- ☐ Herbaceous
- ☐ Shrub
- ☑ Tree

Fuel Model

Indicator Species and Canopy Position

TSME
Upper
ABAM
Upper
VACCI
Low-Mid
MEFE
Low-Mid

Structure Data (for upper layer lifeform)

	Min	Max
Cover	71 %	100 %
Height	Tree 10.1m	Tree 25m
Tree Size Class	Medium 9-21"DBH	

☐ Upper layer lifeform differs from dominant lifeform.

Description

This class represents rapid regeneration by pacific silver fir and mountain hemlock at stand reinitiation. Typical understory species for the type are usually present. [Succession to class E (open canopy/late) after 150yrs. Replacement fire (MFRI about 10,000yrs) resets. Mixed severity fire (MFRI=5000yrs) kills small

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patches of trees, opening the stand to Class C. AltSuccession is used to represent a portion of the landscape that remains in an open condition due to rock outcrops, marshy areas, etc.

Class C **5 %**

Mid Development 1 Open

Upper Layer Lifeform

- ☐ Herbaceous
- ☐ Shrub
- ☑ Tree

Fuel Model

Indicator Species and Canopy Position

TSME
Upper
ABAM
Upper
VACCI
Low-Mid

Structure Data (for upper layer lifeform)

	Min	*Max*
Cover	11 %	70 %
Height	Tree 10.1m	Tree 25m
Tree Size Class	Medium 9-21"DBH	

☐ Upper layer lifeform differs from dominant lifeform.

Description

This class represents mid-seral, open stands that are predominantly comprised of mountain hemlock. This class can persist for decades, eventually transitioning to class D after 150yrs in this class. Replacement fire (MFRI=10,000yrs) resets. Mixed severity fire (MFRI=5000yrs) kills small patches of trees, opening the stand to Class D. If 50yrs pass with no fire the stand fills in to Class B.

Class D **4 %**

Late Development 1 Open

Upper Layer Lifeform

- ☐ Herbaceous
- ☐ Shrub
- ☑ Tree

Fuel Model

Indicator Species and Canopy Position

TSME
Upper
ABAM
Upper
VACCI
Upper

Lower

Structure Data (for upper layer lifeform)

	Min	*Max*
Cover	11 %	70 %
Height	Tree 25.1m	Tree 50m
Tree Size Class	Large 21-33"DBH	

☐ Upper layer lifeform differs from dominant lifeform.

Description

This class represents the late open stand [After 100yrs the stands fill-in to class E. Replacement fire (MFRI=10,000 years). Mixed severity fire (MFRI=5000yrs) kills small patches of trees, maintaining the stand in Class D. If 50yrs pass with no fire the stand fills in to Class E.

Class E **85 %**

Late Development 1 Closed

Upper Layer Lifeform

- ☐ Herbaceous
- ☐ Shrub
- ☑ Tree

Fuel Model

Indicator Species and Canopy Position

TSME
Upper
ABAM
Upper
CHNO
Upper
VACCI
Lower

Structure Data (for upper layer lifeform)

	Min	*Max*
Cover	71 %	100 %
Height	Tree 25.1m	Tree 50m
Tree Size Class	Large 21-33"DBH	

☐ Upper layer lifeform differs from dominant lifeform.

Description

This class represents late-successional stands with large individuals (>20in DBH) of mountain hemlock dominating the stand). Advanced regeneration of mountain hemlock and other shade tolerant species.

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[Maintains in class E. Replacement fire occurs with MFRI=10,000yrs. Mixed severity fire (MFRI=5000yrs) kills small patches of trees, maintaining the stand in Class E. AltSuccession is used to represent a portion of the landscape that remains in an open condition due to rock outcrops, marshy areas, etc.

Disturbances

Fire Regime Group:** V

Historical Fire Size (acres)

Avg
Min
Max

Sources of Fire Regime Data

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

Fire Intervals	Avg FI	Min FI	Max FI	Probability	Percent of All Fires
Replacement	10000			0.0001	32
Mixed	5000			0.0002	65
Surface					
All Fires	3322			0.00031	

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.

Additional Disturbances Modeled

- [ ] Insects/Disease
- [ ] Wind/Weather/Stress
- [ ] Native Grazing
- [ ] Competition
- [ ] Other (optional 1)
- [ ] Other (optional 2)

References

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