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#SSHE **Sitka Spruce - Hemlock**

General Information

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

Modelers		Reviewers	
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Vegetation Type

Forested

Dominant Species*

PISI
TSHE
PSEU
RUSP

General Model Sources

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

LANDFIRE Mapping Zones

1 2 7 8 9

Rapid AssessmentModel Zones

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

Geographic Range

This PNVG occurs on the outer fringe of coast throughout Oregon and Washington (and beyond).

Biophysical Site Description

This PNVG occurs in the coastal fog belt, including up river valleys. The PNVG extends farther inland towards the northern part of its distribution. The climate of this PNVG is characterized by 200 to 300 cm of annual precipitation, frequent summer fog, and mild temperatures year-round.

Vegetation Description

Mature and old forests are characterized by Sitka spruce, western hemlock, and less often other conifers. In southern Oregon Port Oxford cedar is a common associate. Red alder often dominates disturbed sites. Mature and old forests can attain levels of volume and biomass rivaled by few other forests in the world. Lodgepole pine occurs in some cases on dunes or directly adjacent to the ocean.

Disturbance Description

Wildfire occurs infrequently in this PNVG, with a return interval of 300 to 1000 years or longer. Fire is usually stand-replacing.

In most of the PNVG, windthrow is a more significant catastrophic disturbance than wildfire. Windthrow "rotation" is estimated to be between 100 and 200 years, (but can be up to 1000 years due to patchiness). The effects of windthrow are strongly correlated with topography and adjacent land use (e.g., clearcuts).

Adjacency or Identification Concerns

Boundary with wet Douglas-fir-western hemlock type is sometimes indistinct.

Scale Description

Sources of Scale Data [x] Literature [ ] Local Data [ ] Expert Estimate

When fires occur, they often spread from other types and cover large areas (up to hundreds of thousands of acres). Windthrow events can be small (tens of acres) to very large (up to a million acres or more). Within

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

large events, the degree of wind damage is quite variable.

Issues/Problems

On first draft of model, we weren't sure how to capture probability of alternative successional pathway from A to C. For a first try, we guessed at the fractional probability of the pathway (25%), and apportioned that over the 20 year duration of class A.

We assumed that catastrophic wildfire probability was the same for all classes. We assumed that all classes other than A can be converted to A through catastrophic windthrow (every 300 years for all classes). We assumed that non-catastrophic windthrow converts class E to class D.

Miles Hemstrom suggested that there was too much mid-seral due to too frequent wind-throw replacement. Jane Kertis and John Foster (jfoster@tnc.org) made changes (wind-throw and replacement fire have probability 0.0015) to the original model which reduced classes A,B and D and increased class E to the currently stated amounts.

Model Evolution and Comments

One reviewer commented that stands in this type may not really reach peak and then vary around it, but rather fluctuate quite a bit due to persistent wind disturbance, which lessens with distance from the coast.

*Succession Classes***

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

Class A 5 %

Early1 All Struct

Description

Dense shrub layer dominated by salmonberry, elderberry, huckleberry, and salal. Regeneration of red alder or conifers may be present. [Succession to class B after 20 years; Replacement fire; Alternate succession allows a small proportion to proceed to dense alder stand (Class C).]

Dominant Species* and Canopy Position

RUSP
SARA2
PISI
ALRU

Upper Layer Lifeform

☐ Herbaceous
☐ Shrub
☐ Tree

Fuel Model no data

Structure Data (for upper layer lifeform)

	Min	Max
Cover	0 %	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 B 10 %

Mid1 Closed

Description

Dense stands of Sitka spruce and/or western hemlock dominate this class. Stem densities can be very high; tree diameters can be up to 20 inches. [Succession to class E after 60 years in this class; Replacement fire or Wind/weather/stress returns to class A.]

Dominant Species* and Canopy Position

PISI
TSHE

Upper Layer Lifeform

☐ Herbaceous
☐ Shrub
☐ Tree

Fuel Model no data

Structure Data (for upper layer lifeform)

	Min	Max
Cover	40 %	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:

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Class C 1 %

Mid2 Closed

Description

Dense stands of red alder dominate this class. Shrub understories, especially salmonberry, are common. [Succession to class E after 60 years in this class; Wind/weather/stress can return to class A.]

Dominant Species* and Canopy Position

ALRU
RUSP

Structure Data (for upper layer lifeform)

	Min	Max
Cover	40 %	100 %
Height	no data	no data
Tree Size Class	no data	

Upper Layer Lifeform

☐ Herbaceous
☐ Shrub
☐ Tree

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

Fuel Model no data

Class D 10 %

Mid3 Open

Description

Most stems in the class are western hemlock, as partial wind disturbance commonly removes most of the largest Sitka spruces. [Succession to class E after 30 years in this class; Replacement fire or Wind/weather/stress returns to class A.]

Dominant Species* and Canopy Position

TSHE
PISI

Structure Data (for upper layer lifeform)

	Min	Max
Cover	10 %	60 %
Height	no data	no data
Tree Size Class	no data	

Upper Layer Lifeform

☐ Herbaceous
☐ Shrub
☐ Tree

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

Fuel Model no data

Class E 74 %

Late1 Closed

Description

Large individuals of Sitka spruce and western hemlock dominate this class (>20 inches in diameter). Douglas-fir and western red cedar are occasionally present. [Replacement fire returns to class A. Wind/weather/stress either returns to class A, or opens the stand to class D.]

Dominant Species* and Canopy Position

PISI
TSHE

Structure Data (for upper layer lifeform)

	Min	Max
Cover	60 %	100 %
Height	no data	no data
Tree Size Class	no data	

Upper Layer Lifeform

☐ Herbaceous
☐ Shrub
☐ Tree

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

Fuel Model no data

Disturbances

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Disturbances Modeled

- [x] Fire
- [ ] Insects/Disease
- [x] 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

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

Fire Regime Group: **5**

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.

	Avg FI	*Min FI*	*Max FI*	*Probability*	*Percent of All Fires*
Replacement	700	300	2000	0.00143	99
Mixed					
Surface					
All Fires	699			0.00145	

References

Agee, J.K. 1993. Fire Ecology of Pacfic Northwest Forests. Island Press, Washington, D.C.

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