

## 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](http://www.landfire.gov). Please direct questions to [helpdesk@landfire.gov](mailto:helpdesk@landfire.gov).

### Potential Natural Vegetation Group (PNVG)

R2SFPI Spruce-Fir / Pine Subalpine

#### General Information

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

##### Modelers

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(original)

##### Reviewers

##### Vegetation Type

Forested

##### General Model Sources

- Literature  
 Local Data  
 Expert Estimate

##### Rapid Assessment Model Zones

- |   |  |
|---|--|
| <input type="checkbox"/> California             | <input type="checkbox"/> Pacific Northwest |
| <input checked="" type="checkbox"/> Great Basin | <input type="checkbox"/> South Central     |
| <input type="checkbox"/> Great Lakes            | <input type="checkbox"/> Southeast         |
| <input type="checkbox"/> Northeast              | <input type="checkbox"/> S. Appalachians   |
| <input type="checkbox"/> Northern Plains        | <input type="checkbox"/> Southwest         |
| <input type="checkbox"/> N-Cent. Rockies        |  |

##### Dominant Species\*

PIAL  
PIFL2  
PIEN  
ABLA

##### LANDFIRE Mapping Zones

12	17
13	18
16	

#### Geographic Range

This system is found throughout the Rocky Mountains, the Sierra Nevada and at higher elevations in the Basin & Range. This model specifically relates to occurrences in the Great Basin region.

#### Biophysical Site Description

Elevations typically range from 8500-11,000 feet in the subalpine zone on gentle to moderately steep terrain (e.g., 10-60% slope), high elevation ridgetops, and cold-air drainage basins. Drier sites may include lodgepole pine, and moister sites include Engelmann spruce and/or subalpine fir, or blue spruce.

#### Vegetation Description

The overstory is typically dominated by Engelmann spruce and/or subalpine fir. Other tree species may include lodgepole pine, aspen, limber pine, bristlecone pine, and Douglas-fir (not in Nevada). Common understory species include Ribes spp., Pachistima myrsinites, and Arnica spp.

Growing seasons tend to be very short ~90-120 days, resulting in slow vegetative growth.

#### Disturbance Description

Fire Regime V: Primarily long-interval (e.g., 200-500 yr) stand replacement fires, with mixed severity fire (e.g., 150 yr) occurring in open conditions. Disturbances also include insect/disease (every 250 years) and windthrow events than thin younger closed stands.

#### Adjacency or Identification Concerns

Includes dry-mesic and mesic spruce fir forest types. Mesic spruce-fir PNVG is limited in extent and may not be mappable. If aspen is present in large patches or if conifers are not coming in after ~30 years, the PNVG is probably misclassified and one of the Aspen types (R2ASMCup or R2ASPN) should be considered. Upslope the PNVG grades into true alpine or Krumholtz systems.

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

This PNVG may be similar to the PNVGs R0SPFI from the Northern and Central Rockies model zone and R3SPFI from the Southwest model zone.

**Scale Description**

**Sources of Scale Data**  Literature  Local Data  Expert Estimate

Patch sizes vary but are mostly in the hundreds of acres, with rare very large patches (disturbances) in the thousands of acres. There may be frequent small disturbances in the 10s of acres or less.

**Issues/Problems**

**Model Evolution and Comments**

Original R2SPFI model was rejected by reviewers (Julia Richardson [jhrichardson@fs.fed.us], Clinton Williams [cwilliams@fs.fed.us], Michele Slaton [mslaton@fs.fed.us]) because it mixed fundamentally different species and did not represent well their ecology. Spruce-fir model was adopted from the Southwest RA. Modifications were made to R3SPFI on 2/24/05 by Pohl for LANDFIRE BPS modeling. The revised R3SFFI model was further modified in Cedar City and the late-development, open box D deleted.

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

**Class A 20 %**

Early1 PostRep

**Description**

Early succession after moderately long- to long interval replacement fires. Within 40 years, conifers will replace herbaceous vegetation and shrubs, Occasionally, a lack of seed source of conifer may maintain this condition (modeled as competition/maintenance). The average FRI for replacement fire is 200 years.

**Dominant Species\* and Canopy Position**

BRMA4  
PIEN  
ABLA

**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 30 %**

Mid1 Closed

**Description**

Shade tolerant- and mixed conifer saplings to poles (>5% canopy cover). Spruce and fir dominate and canopy is dense. At 130 years, this class succeeds to E (late-development closed). Replacement fire will cause a transition to class A every 200 yrs on average. Insects and disease may open up the canopy, causing a transition to class C (approximately 0.7% of the class per year). Dog-hair conditions in this state may maintain the mid-development closed condition.

**Dominant Species\* and Canopy Position**

PIEN  
ABLA

**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:

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

**Class C 15%**

Mid1 Open  
**Description**

Primarily moderately tolerant saplings to poles (1" - 6.9" dbh) and <50% canopy cover of spruce and fir.

At 90 years, this condition succeeds to class D. Replacement fire (mean FRI of 200 years) will cause a transition to class A. Mixed severity fires may occur on small portions of this class (approximately 0.1% per year) and maintain the mid-development open condition.

**Dominant Species\* and Canopy Position**

PIEN  
ABLA

**Upper Layer Lifeform**

- Herbaceous
- Shrub
- Tree

**Fuel Model** no data

**Structure Data (for upper layer lifeform)**

	Min	Max
Cover	0 %	50 %
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 35%**

Late1 Open  
**Description**

Pole- and larger diameter moderately to shade tolerant conifer species (>50% canopy cover), in moderate to large size patches, all aspects. Spruce and fir dominate.

This class will self-perpetuate if no disturbances cause a transition. Replacement fire will cause a transition to class A every 250 year on average. Insects and disease will replace the stand every 250 years on average.

**Dominant Species\* and Canopy Position**

PIEN  
ABLA

**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:

**Class E 0%**

Late1 Closed  
**Description**

**Dominant Species\* and Canopy Position**

**Structure Data (for upper layer lifeform)**

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

**Upper Layer Lifeform**

- Herbaceous
- Shrub
- Tree

**Fuel Model** no data

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

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## Disturbances

### 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

### 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.

### Sources of Fire Regime Data

- Literature
- Local Data
- Expert Estimate

	Avg FI	Min FI	Max FI	Probability	Percent of All Fires
<i>Replacement</i>	217	75	300	0.00461	98
<i>Mixed</i>	10000			0.0001	2
<i>Surface</i>					
<i>All Fires</i>	212			0.00472	

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