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):

R2SFPI **Spruce-Fir / Pine Subalpine**

General Information

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

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Vegetation Type

Forested

Dominant Species*

PIAL
PIFL2
PIEN
ABLA

General Model Sources

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

LANDFIRE Mapping Zones

12 17
13 18
16

Rapid Assessment Model Zones

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

Geographic Range

This system if 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 and Indicator 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.

Indicator Species* and Canopy Position

BRMA4
PIEN
ABLA

Structure Data (for upper layer lifeform)

	Min	Max
Cover	0 %	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 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

Indicator Species* and Canopy Position

PIEN
ABLA

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

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

maintain the mid-development closed condition.

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.

Indicator Species* and Canopy Position

PIEN
ABLA

Structure Data (for upper layer lifeform)

	Min	*Max*
Cover	0 %	50 %
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 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.

Indicator Species* and Canopy Position

PIEN
ABLA

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 E 0 %

Late1 Closed

Description

Indicator 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

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

Fuel Model no data

Disturbances

Non-Fire Disturbances Modeled

- ☑ Insects/Disease
- ☑ Wind/Weather/Stress
- ☐ Native Grazing
- ☑ Competition
- ☐ Other:
- ☐ Other:

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

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*
Replacement	217	75	300	0.00461	98
Mixed	10000			0.0001	2
Surface					
All Fires	212			0.00472	

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