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)

R3MCONcm   **Southwest Mixed Conifer--Cool, Moist with Aspen**

General Information

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

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Vegetation Type

Forested

Dominant Species*

ABCO
POTR
PSME
PIPO

General Model Sources

- ☑ Literature
- ☑ Local Data
- ☑ Expert Estimate

LANDFIRE Mapping Zones

14	24	28
15	25	
23	27	

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

Generally found in AZ, NM, and southwest CO. This is a transition forest that occurs between the Warm/Dry mixed conifer and subalpine forest.

Biophysical Site Description

This PNVG's distribution is strongly driven by moisture gradients such as aspect and elevation. It is found on all aspects and slopes and a wide elevational band bounded by warm/dry mixed conifer at the low end and the subalpine forest on the upper end. In southwest CO cool/moist mixed conifer can found from 7000' to 10500'. Soils are generally of sandstone and shale. The same moisture gradients will influence the cool/moist mixed conifer's distribution elsewhere and it can be found much lower and much higher elevations than those described here.

Vegetation Description

The mixed conifer is a transitional forest and therefore best thought of as a continuum that follows a moisture gradient driven by elevation and aspect. The cool moist mixed conifer will have much less ponderosa pine than the warm/dry. However ponderosa pine is found in small groups or isolated places usually in open areas, edges of meadows, ridges. It and Douglas-fir are often canopy dominants with a heavy white fir understory. The major tree species found in the cool/moist are white fir, Douglas-fir, ponderosa pine, blue spruce, and aspen. Other tree species encountered are Rocky Mountain juniper and southwestern white pine. Near riparian areas, wetlands and drainages blue spruce can be quite common. These stands are predominantly composed of white fir, aspen and Douglas-fir. Major understory species at the lower end include Gambel oak, Arctostaphylos uva-ursi, Chimaphila umbellatum, Delphinium nelsoni, Mertensia spp, Carex gyeri, etc. Upper end species vary by region.

Disturbance Description

Fire is the primary disturbance although insects can also play a major role. Fire frequencies are very variable and the cool/moist supports a mixed fire regime. Mixed severity fires occurred every 6 - 60 years.

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

Lethal fires are usually at longer intervals, 100+ years.

Insect and disease can behave as either a thinning or large-scale mortality agent, but was not modeled.

Adjacency or Identification Concerns

This PNVG may be similar to the PNVG R3MCONcm for the Southwest model zone.   The Southwest model includes some mixed severity fire. The Great Basin model has a class (E) that is pure conifer without aspen.

Scale Description

| Sources of Scale Data | ☑ Literature | ☑ Local Data | ☑ Expert Estimate |

Issues/Problems

Could not model the aspen and mixed conifer succession in one model because of box limitations.

Model Evolution and Comments

Peer review resulted in overall reduction by half of mixed and surface fire frequencies. The resulting changes were: the percent in classes A/B/C/D/E changed from 10/25/35/20/10 to 10/40/25/10/10. The original fire regimes were modeled at 200/75/66 year frequencies for replacement/mixed/surface severities, respectively, with an overall MFI of 30 years.

Succession Classes**

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

Class A   10 %

Early1 All Struct

Description

Post-lethal fire vegetation will depend on what was on site before it burned. Two main pathways are modeled here. One with aspen and one without. If there is no aspen, then the site will start as grass/forb/shrub. There can be a few trees that regenerate immediately but their density will be low. Fire will maintain or prolong this stage.   If aspen was on site before the fire, it will return as an aspen stand.   Conifers such as white fir can regenerate with the aspen but again they will be few. Any surviving conifers will be seed source. If just aspen canopy cover is 50 - 100%.

Dominant Species* and Canopy Position

ABCO

POTR5

PSME

SYRO

Upper Layer Lifeform

☐ Herbaceous
☐ Shrub
☐ Tree

Fuel Model   no data

Structure Data (for upper layer lifeform)

	Min	Max
Cover	15 %	35 %
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   40 %

Mid1 Closed

Description

Aspen will be over 10' tall and still very dense. Seedling and sapling white fir, Douglas-fir can be found in aspen stand. Mountain snowberry is common shrub. Serviceberry can also be present. If aspen then 50 - 80% canopy cover.

Dominant Species* and Canopy Position

ABCO
PSME
AMUT
SYRO

Upper Layer Lifeform

☐ Herbaceous
☐ Shrub
☐ Tree

Fuel Model no data

Structure Data (for upper layer lifeform)

	Min	Max
Cover	35 %	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 C   25 %

Mid1 Open

Description

If not aspen and surface fires occur, stand progresses to open conifer (white fir and Douglas-fir, an errant ponderosa) with shrub and grass/forb understory.

Dominant Species* and Canopy Position

ABCO
PSME
SYRO
AMUT

Upper Layer Lifeform

☐ Herbaceous
☐ Shrub
☐ Tree

Fuel Model no data

Structure Data (for upper layer lifeform)

	Min	Max
Cover	35 %	60 %
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   10 %

Late1 Open

Description

If no aspen and surface and mixed fires occur Douglas-fir will be favored over white fir. White fir always remain in stand because of vigorous regeneration.

Dominant Species* and Canopy Position

ABCO
PSME
POTR5
SYRO

Upper Layer Lifeform

☐ Herbaceous
☐ Shrub
☐ Tree

Fuel Model no data

Structure Data (for upper layer lifeform)

	Min	Max
Cover	45 %	60 %
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   15 %

Late1 Closed

Description

If no fire, conifer stand becomes very dense. Douglas-fir with white fire understory. Other conifers such as blue spruce and subalpine fir can come in.

 If aspen is part of mix, it will be

Dominant Species* and Canopy Position

PSME
ABCO
SYRO

Upper Layer Lifeform

☐ Herbaceous
☐ Shrub
☐ Tree

Fuel Model no data

Structure Data (for upper layer lifeform)

	Min	Max
Cover	60 %	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:

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

replaced by white fir and Douglas-fir. Dominance of white fir can transition to Douglas-fir eventually.

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

Sources of Fire Regime Data

☑ Literature
☑ Local Data
☑ Expert Estimate

Fire Regime Group: 3

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	200	80	200	0.005	29
Mixed	165	35	125	0.00606	35
Surface	160	10	100	0.00625	36
All Fires	58			0.01731	

References

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