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

## Potential Natural Vegetation Group (PNVG):
R3MGRAs  Montane and Subalpine Grasslands with Shrubs or Trees

### General Information

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

**Modelers**  
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**Reviewers**  
William L. Baker  
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#### Vegetation Type

<table>
<thead>
<tr>
<th>Dominant Species*</th>
<th>Grassland</th>
<th>General Model Sources</th>
<th>Rapid Assessment Model Zones</th>
</tr>
</thead>
<tbody>
<tr>
<td>FETH</td>
<td>✓Literature ✓Local Data</td>
<td>☐California ☐Pacific Northwest</td>
<td></td>
</tr>
<tr>
<td>FEAR2</td>
<td></td>
<td>☐Great Basin ☐South Central</td>
<td></td>
</tr>
<tr>
<td>PEFL15</td>
<td></td>
<td>☐Great Lakes ☐Southeast</td>
<td></td>
</tr>
<tr>
<td>CHNA2</td>
<td></td>
<td>☐Northeast ☐S. Appalachians</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>☐Northern Plains ✓Southwest</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>☐N-Cent.Rockies</td>
<td></td>
</tr>
</tbody>
</table>

#### Geographic Range
Northern Arizona, Southern and Northern New Mexico, Southern Colorado

#### Biophysical Site Description
Elevated plains, terraces along valleys, toeslopes of hills and mountain side slopes ranging from nearly level to very steep topography. Aspect varies, the larger patches are on southern exposures and on summit plains. Elevation ranges from 7500 to 11,800 feet. Moderately deep to deep Typic to Pachic Cryoborolls (FETH) and Argiborolls/Haploborolls (FEAR2). Pachic Udic Argiborolls.

#### Vegetation Description
Grassland types include Thurber fescue (FETH), Arizona fescue (FEAR2), sheep fescue (FEOV), mountain muhly (MUMO), timber/Parry's oatgrass (DAIN/DAPA), Kentucky bluegrass (POPR), nodding brome (BRAN); tufted hairgrass (DECE), Parry's oatgrass (DAPA2), mountain muhly (MUMO), Idaho fescue (FEID), Agropyron spicatum (AGSP; currently Pseudoroegneria spicata), and Deschampsia cespitosa (DECE). Various sedges (CAREX spp.) will be present in moist (concave) sites.

Shrubs include shrubby cinquefoil (PEFL15), at higher elevations and rubber rabbitbrush (CHNA2) at the lower elevations in the montane zone.

Trees may include ponderosa pine, white fir, Douglas-fir, Engelmann spruce, blue spruce, and subalpine fir.

#### Disturbance Description
Historical fire frequencies for grassland types are difficult to estimate and some disagreement about the frequency of fire in mountain grasslands exists. Experts that contributed to this model suggested MFIs ranging from 10-300 years, but agree that there is little scientific basis to estimate fire frequencies.

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*Dominant and Indicator Species are from the NRCS PLANTS database. To check a species code, please visit [http://plants.usda.gov](http://plants.usda.gov).
For this model, stand replacement fires were modeled with approximately 70 yr MFI based upon historic photographic analysis, personal communication (Barry Johnston-R2) and inference from fire regimes of adjacent forest types (PIPO 3-12yr, ABCO/PSMEG 14-46yr, PIEN/ABLAA 60-180+yr). Surface fires (only occurring in the class with >15% woody species) occurs with an average MFI or 30 years. Anthropogenic (pre-European, Spanish colonial) fire use ignitions may have been 5-15 years. However, contributors note that estimating return intervals from rephotography or adjacent forests are both incomplete and imperfect methods.

**Adjacency or Identification Concerns**

<table>
<thead>
<tr>
<th>Scale Description</th>
<th>Sources of Scale Data</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Literature</td>
</tr>
</tbody>
</table>

**Issues/Problems**

**Model Evolution and Comments**

Peer review disagreed strongly with the current model construct and suggested combining all mountain grassland models (R3MGRA and R3MGRAws) and changing the overall MFI to 100-300 years (for montane and subalpine, respectively) with only replacement fire. The model values were unchanged, but descriptions were modified to incorporate these views.

Quality control found one rule violation (use of disturbance to accelerate age) and when this was eliminated, the frequency of surface fire was reduced from 10 years to 30 years, but had no effect on the resulting percent in each class.

A Mountain Grassland with tree PNVG (R3MGRAwt) created at the Southwest Rapid Assessment workshop was combined with this type.

**Succession Classes**

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

<table>
<thead>
<tr>
<th>Class</th>
<th>10 %</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Early1 PostRep</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Description</strong></td>
<td>Pioneer species of pine dropseed (BLTR) and thurber fescue (FETH) and Arizona fescue (FAR2) associations. Some shrubs (shrubby cinquefoil (PEFL15) or rubber rabbitbrush (CHNA2)) present. Low litter cover and high bare soil (&gt;25%)</td>
</tr>
<tr>
<td><strong>Indicator Species</strong> and <strong>Canopy Position</strong></td>
<td><strong>Structure Data (for upper layer lifeform)</strong></td>
</tr>
<tr>
<td>FETH</td>
<td><strong>Min</strong></td>
</tr>
<tr>
<td>FEAR2</td>
<td>Cover</td>
</tr>
<tr>
<td>CHNA2</td>
<td>Height</td>
</tr>
<tr>
<td>PEFL15</td>
<td>Tree Size Class</td>
</tr>
<tr>
<td><strong>Upper Layer Lifeform</strong></td>
<td><strong>Fuel Model</strong></td>
</tr>
<tr>
<td>☑ Herbaceous</td>
<td>no data</td>
</tr>
<tr>
<td>☑ Shrub</td>
<td></td>
</tr>
<tr>
<td>☑ Tree</td>
<td></td>
</tr>
</tbody>
</table>

*Dominant and Indicator Species are from the NRCS PLANTS database. To check a species code, please visit http://plants.usda.gov.*
Class B  60 %
Mid1 Closed

Description
Closed canopy of Thurber and Arizona fescue (FETH and FEAR2) with only minor woody component (<15%). Potentilla fruticosa (POFR4) may be well represented. Bare soil less than 20%.

Indicator Species* and Canopy Position
FETH
FEAR2
PEFL15

Upper Layer Lifeform
☐ Herbaceous
☐ Shrub
☐ Tree

Fuel Model no data

Structure Data (for upper layer lifeform)

<table>
<thead>
<tr>
<th>Min</th>
<th>Max</th>
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</thead>
<tbody>
<tr>
<td>35 %</td>
<td>54 %</td>
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<tr>
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</tbody>
</table>

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

Class C  30 %
Mid1 Open

Description
Closed canopy of fescue (FETH and FEAR2) with >15% cover of woody species (see species list under vegetation description; many tree species may be present). Bare soil less than 10%. Surface fires can occur in this class, usually eliminating shrubs or tree seedlings and causing a transition to class B.

Indicator Species* and Canopy Position
CHNA2
PEFL15
PIEN
PIPO

Upper Layer Lifeform
☐ Herbaceous
☐ Shrub
☐ Tree

Fuel Model no data

Structure Data (for upper layer lifeform)

<table>
<thead>
<tr>
<th>Min</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>55 %</td>
<td>100 %</td>
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<td>no data</td>
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<tr>
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<td>no data</td>
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</tbody>
</table>

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

Class D  0 %
Late1 Open

Description

Indicator Species* and Canopy Position

Upper Layer Lifeform
☐ Herbaceous
☐ Shrub
☐ Tree

Fuel Model no data

Structure Data (for upper layer lifeform)

<table>
<thead>
<tr>
<th>Min</th>
<th>Max</th>
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</thead>
<tbody>
<tr>
<td>65 %</td>
<td>95 %</td>
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</tbody>
</table>

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

Class E  0 %
Late1 Closed

Description

Indicator Species* and Canopy Position

Fuel Model no data

Structure Data (for upper layer lifeform)

<table>
<thead>
<tr>
<th>Min</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 %</td>
<td>%</td>
</tr>
<tr>
<td>no data</td>
<td>no data</td>
</tr>
<tr>
<td>no data</td>
<td>no data</td>
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</tbody>
</table>

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

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### Disturbances

#### Non-Fire Disturbances Modeled

- [ ] Insects/Disease
- [ ] Wind/Weather/Stress
- [ ] Native Grazing
- [x] Competition
- [ ] Other:
- [ ] Other:

#### Historical Fire Size (acres)

- Avg: 
- Min: 
- Max: 

#### Sources of Fire Regime Data

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

#### Fire Regime Group:

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 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

<table>
<thead>
<tr>
<th>Source</th>
<th>Avg FI</th>
<th>Min FI</th>
<th>Max FI</th>
<th>Probability</th>
<th>Percent of All Fires</th>
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</thead>
<tbody>
<tr>
<td>Replacement</td>
<td>70</td>
<td>10</td>
<td>100</td>
<td>0.01429</td>
<td>30</td>
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<td>Mixed</td>
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<td>0.03333</td>
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<tr>
<td>All Fires</td>
<td>21</td>
<td></td>
<td></td>
<td>0.04763</td>
<td></td>
</tr>
</tbody>
</table>

### References

Allen, Craig D., 1984. Montane grassland in the landscape of the Jemez Mountains, New Mexico, Master's Thesis, Univ. Wisconsin, Madison, WI.


Miller, Geg, Norm Ambos, Pat Boness, Deanna Ryher, George Robertson, Ken Scalzone, Rory Steinke and...


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