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):

**R0PICO** Persistent Lodgepole Pine

**General Information**

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

<table>
<thead>
<tr>
<th>Modelers</th>
<th>Reviewers</th>
</tr>
</thead>
<tbody>
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</tr>
</tbody>
</table>

**Vegetation Type**

- Forested

**Dominant Species**

- PICO
- CAGE2
- VASC
- CARO5

**General Model Sources**

- Literature
- Local Data
- Expert Estimate

**Rapid Assessment Model Zones**

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

**LANDFIRE Mapping Zones**

<table>
<thead>
<tr>
<th></th>
<th>10</th>
<th>21</th>
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</thead>
<tbody>
<tr>
<td>19</td>
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</tr>
<tr>
<td>20</td>
<td>29</td>
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</tr>
</tbody>
</table>

**Geographic Range**

Northern Rockies, especially on the Yellowstone Plateau.

**Biophysical Site Description**

This type occurs on coarse, sterile soils derived largely from silicic rocks, (rhyolite, granite, and some sterile sandstone). Annual precipitation averages 25-35 in. with fairly even distribution across the months with slightly more in the spring and less during the summer.

**Vegetation Description**

Mature to overmature stands are dominated by slow growing lodgepole pine (Pinus contorta Doug.). Lodgepole pine occurs in nearly pure stands throughout all successional stages (i.e., lodgepole pine plays early-seral and quasi-climax roles in this system). With a sparse lodgepole pine understory and forest floor of scattered clumps of Geyer’s sedge, Ross’ sedge and some grouse whortleberry patches; early successional stands can be dense lodgepole pine seedlings to saplings that thin over time to widely spaced trees with a multi-aged. It is often associated with Purshia tridentata.

**Disturbance Description**

Fire is infrequent and often quite patchy due to lack of surface fuels. High winds are needed to carry crown fire which transitions to the crowns above patches of lodgepole reproduction. Pine beetles kill the larger trees leaving the younger trees and patches of establishment sites for new trees. This can produce conditions more conducive to larger crown fires.

Mistletoe may cause mortality in older trees and the profusion of induced branches and partial crown mortality, which may predispose them to intense torching that may lead to crown fire.

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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.*
Adjacency or Identification Concerns

Mid-seral stages may be confused with dense stands of lodgepole dominated seral stages of more moist PNVGs. They can be distinguished by a more continuous cover of herbaceous growth and the occasional presence of spruce or fir seedlings.

This type corresponds to cool habitat types dominated by lodgepole pine (Pfister et al. 1977).

Scale Description

Patch size ranges from a few tens of acres to a few hundred on sandstone outcrops to areas of thousands to tens of thousand on rhyolite and granite.

Issues/Problems

Model Evolution and Comments

Workshop code was PICO1.

Peer-review was incorporated on 4/6/2005 and resulted in adding blowdown disturbances (1 in 1000 years) to classes B and D; adding competition/maintenance to class B (i.e., doghair conditions resulting in delayed succession); and changing the frequency of fire in class A to match the frequency in other classes (400 year frequency); and adding mixed severity fire to class C at a low frequency.

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>%</th>
<th>Indicator Species* and Canopy Position</th>
<th>Structure Data (for upper layer lifeform)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>15</td>
<td>PICO, CAGE2, CARO5</td>
<td>Min: Cover 0%, Max: 100%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Upper Layer Lifeform:</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Herbaceous, Shrub, Tree</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Fuel Model: no data</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Height: no data</td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>25</td>
<td>PICO, CAGE2, CARO5</td>
<td>Min: Cover 30%, Max: 100%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Upper Layer Lifeform:</td>
<td></td>
</tr>
<tr>
<td></td>
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<tr>
<td></td>
<td></td>
<td>Height: no data</td>
<td></td>
</tr>
</tbody>
</table>

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**Class C**  15%

**Mid1 Open**

**Description**
Scattered pole sized lodgepole pine in a Carex matrix similar to a bunch grass grassland with various other herbaceous species. Approximately 33% of fires in this class will be mixed severity, maintaining the open condition; the rest of fires will be replacement severity, causing a transition to class A. At 200 years, this class succeeds to class D.

**Indicator Species* and Canopy Position**
- PICO
- CAGE2
- CARO5

**Upper Layer Lifeform**
- □ Herbaceous
- □ Shrub
- □ Tree

**Structure Data**

<table>
<thead>
<tr>
<th></th>
<th>Min</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Cover</strong></td>
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<td><strong>Height</strong></td>
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<tr>
<td><strong>Tree Size Class</strong></td>
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</tr>
</tbody>
</table>

**Fuel Model**  no data

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

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**Class D**  45%

**Late1 Closed**

**Description**
Multi-aged sparse to dense lodgepole pine with a sparse herbaceous layer dominated by Carex geyeri. Insects and blowdown may open the canopy, causing a transition to class C.

**Indicator Species* and Canopy Position**
- PICO
- CAGE2
- CARO5

**Upper Layer Lifeform**
- □ Herbaceous
- □ Shrub
- □ Tree

**Structure Data**

<table>
<thead>
<tr>
<th></th>
<th>Min</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Cover</strong></td>
<td>30 %</td>
<td>100 %</td>
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<tr>
<td><strong>Height</strong></td>
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<td><strong>Tree Size Class</strong></td>
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</table>

**Fuel Model**  no data

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

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**Class E**  0%

**Late1 Closed**

**Description**

**Indicator Species* and Canopy Position**
- PICO
- CAGE2
- CARO5

**Upper Layer Lifeform**
- □ Herbaceous
- □ Shrub
- □ Tree

**Structure Data**

<table>
<thead>
<tr>
<th></th>
<th>Min</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Cover</strong></td>
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<td><strong>Tree Size Class</strong></td>
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**Fuel Model**  no data

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

---

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**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: 

**Sources of Fire Regime Data**

- Literature
- Local Data
- Expert Estimate

<table>
<thead>
<tr>
<th></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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<tbody>
<tr>
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<td>300</td>
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<td>Mixed</td>
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<td>600</td>
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<tr>
<td>Surface</td>
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<tr>
<td>All Fires</td>
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<td>0.00252</td>
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</tbody>
</table>

**Fire Intervals (FI):**

Fire interval is expressed in years for each fire severity class and for all types of fire combined. 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.

**References**


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