

## 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)

R6GLSFif Minnesota Spruce Fir Adjacent to Lake Superior and Drift and Lake Plain

### General Information

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

#### Modelers

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#### 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 type="checkbox"/> Great Basin            | <input type="checkbox"/> South Central     |
| <input checked="" 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\*

PIGL      POTR5  
ABBA      BEPA  
PIST      LALA  
THOC      ACRU

#### LANDFIRE Mapping Zones

41

#### Geographic Range

System occurs in north central Minnesota and the arrowhead region with deep, nutrient-rich, fine-textured soils.

#### Biophysical Site Description

System is characterized by transitional landforms between northern hardwood uplands (Lake Superior's north shore) and lowlands with saturated soils (central Minnesota). These are areas where deep material exists that is not necessarily bedrock-controlled.

#### Vegetation Description

These are dense forests with early-seral aspen-birch, tamarack, spruce-fir, developing mid-seral spruce-fir and late-seral spruce-fir, northern white cedar, eastern white pine, and northern hardwoods (sugar maple, yellow birch, red maple). Late-seral is an uneven-aged system with gaps regenerating to spruce-fir and other species.

#### Disturbance Description

Fire Regime V is applicable. Two primary infrequent disturbance factors occur involving distinct successional pathways. Wind events (1,000-year intervals) developed early-seral spruce-fir. Fire developed early-seral aspen-birch. Stand replacement fire at a 300-year interval dependent on low-intensity maintenance fires to retain the late-seral uneven-aged stage. Spruce budworm appears to affect individual trees rather than produce broad-scale infestations.

#### Adjacency or Identification Concerns

#### Scale Description

Sources of Scale Data  Literature  Local Data  Expert Estimate

Infrequent fires burned large areas (thousands to ten of thousands of acres), killing all or most overstory species. Outbreaks of spruce budworm occurred every 30 to 60 years, killing primarily balsam fir over medium scale (hundreds to thousands of acres); occasional wind storms blew down trees over small scale

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

(ten or more acres).

**Issues/Problems**

Late-seral conditions are not well defined, as the amount of hardwoods in this stage are not yet known.

**Model Evolution and Comments**

Jim Gallagher - Chippewa National Forest; Dave Cleland - North Central Forest Experiment Station, Randy Swaty - The Nature Conservancy; Mary Shedd - Superior National Forest.

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

**Class A 25%**

Early1 Closed

**Description**

Seedling-sapling-pole (0 - 50 years) aspen-birch stand following stand-replacement fire event.

**Dominant Species\* and Canopy Position**

POTR5 Upper  
 BETA Upper

**Upper Layer Lifeform**

- Herbaceous
- Shrub
- Tree

**Fuel Model** 8

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

	Min	Max
Cover	80 %	100 %
Height	Tree Regen <5m	Tree Medium 10-24m
Tree Size Class	no data	

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

**Class B 10%**

Early2 Open

**Description**

Seedling-sapling-pole spruce-fir stands following wind-replacement event.

**Dominant Species\* and Canopy Position**

ABBA Upper  
 PIGL Upper  
 LALA Upper

**Upper Layer Lifeform**

- Herbaceous
- Shrub
- Tree

**Fuel Model** 8

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

	Min	Max
Cover	50 %	100 %
Height	Tree Regen <5m	Tree Medium 10-24m
Tree Size Class	no data	

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

**Class C 15%**

Mid1 Closed

**Description**

Mature aspen-birch with spruce-fir understory development.

**Dominant Species\* and Canopy Position**

POTR5 Upper  
 BETA Upper  
 PIGL Low-Mid  
 ABBA Low-Mid

**Upper Layer Lifeform**

- Herbaceous
- Shrub
- Tree

**Fuel Model** 8

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

	Min	Max
Cover	80 %	100 %
Height	Tree Regen <5m	Tree Tall 25-49m
Tree Size Class	Medium 9-21"DBH	

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

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**Class D 5%**

Mid2 Open

**Description**

Spruce-fir pole to small saw log stands with spruce-fir, northern white cedar, white pine, and northern hardwoods.

**Dominant Species\* and Canopy Position**

PIGL Upper  
ABBA Upper  
PIST Low-Mid  
ACRU Low-Mid

**Upper Layer Lifeform**

- Herbaceous
- Shrub
- Tree

**Fuel Model** 8

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

	Min	Max
Cover	50 %	100 %
Height	Tree Regen <5m	Tree Tall 25-49m
Tree Size Class	Medium 9-21"DBH	

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

**Class E 45%**

Late1 Closed

**Description**

Uneven-aged spruce-fir forest with components of northern white cedar, eastern white pine, northern hardwoods (sugar maple, red maple, yellow birch).

**Dominant Species\* and Canopy Position**

PIGL Upper  
PIST Upper  
THOC2 Upper  
ACRU Upper

**Upper Layer Lifeform**

- Herbaceous
- Shrub
- Tree

**Fuel Model** 8

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

	Min	Max
Cover	80 %	100 %
Height	Tree Regen <5m	Tree Tall 25-49m
Tree Size Class	Large 21-33"DBH	

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

**Disturbances**

**Disturbances Modeled**

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

**Historical Fire Size (acres)**

Avg: no data  
Min: 10  
Max: 10000

**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	300			0.00333	21
Mixed					
Surface	80			0.0125	79
All Fires	63			0.01584	

**Sources of Fire Regime Data**

- Literature
- Local Data
- Expert Estimate

**References**

Almendinger, John C. and Dan S. Hanson, 1998. Draft Ecological Land Classification Handbook for the Northern Minnesota Drift and Lake Plains and the Chippewa National Forest. Unpublished report. Ecological Land Classification Program, Minnesota Department of Natural Resources, Division of Forestry. Brown, Terry, and Mark White, 2001. Drift and Lake Plains: A Comparison of Range of Natural Variation and Current Conditions. Prepared for Minnesota Resource Council. Unpublished report. University of

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