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):

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		Reviewers
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Vegetation Type

Forested

Dominant Species*

PIGL	POTR5
ABBA	BEPA
PIST	LALA
THOC2	ACRU

General Model Sources

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

LANDFIRE Mapping Zones

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Rapid Assessment Model Zones

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

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

Infrequent fires burned large areas (thousands to ten of thousands of acres), killing all or most overstory

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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 (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.

Indicator 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.

Indicator 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.

Indicator Species* and Canopy Position

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

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	

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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.

Upper Layer Lifeform

☐ Herbaceous
☐ Shrub
☑ Tree

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

Fuel Model 8

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.

Indicator 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).

Indicator 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

Non-Fire Disturbances Modeled

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

Historical Fire Size (acres)

Avg:
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 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	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.

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