NRV Seral Stage Research

FRI ND Program Information Session
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Managing Age-Class Distributions

What amounts of old growth forest are appropriate to manage for on landscape X from a biodiversity perspective?
Pre-Industrial Landscape in 1950
(no fire control, harvesting, roads...)

4% is “natural”... but there is no “variation”.
Landscape in 1850

75
70
65
60
55
50
45
40
35
30
25
20
15
10
5
0

16%
Landscape in 1800

12%
The Problem

Empirically, we can at best generate one “natural” landscape snapshot. So much for NRV…

Modeling is the only way to translate observed variation over space in time of the disturbance frequency, size (and severity) to generate multiple probable landscape snapshots.

Geek Details

A spatially-explicit, raster-based, monte-carlo, percolation disturbance simulation model.

LANDMINE, BFOLDS, LANDIS, etc …
Disturbance Patterns

- Type
- Frequency
- Size & Shape
- Severity
- Tendencies

Landscape Condition

- Seral-stage levels
- Old forest patch sizes
- Edge density
- Coarse woody debris
- Suspended sediment & O²...

Biological Consequences

- Fire risk
- MPB risk
- Water quality
- Caribou habitat
- Grizzly bear habitat…
Simulated Landscapes for the Sunpine FMA
Old Forest on Upper Foothills Landscapes of Alberta

*(based on ½ million ha areas)*

<table>
<thead>
<tr>
<th>Pct. Forest &gt; 200 yrs.</th>
<th>Occurred</th>
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</thead>
<tbody>
<tr>
<td>0.1-2%</td>
<td>13% of the time</td>
</tr>
<tr>
<td>3-10%</td>
<td>49% of the time</td>
</tr>
<tr>
<td>11-20%</td>
<td>19% of the time</td>
</tr>
<tr>
<td>21-30%</td>
<td>9% of the time</td>
</tr>
<tr>
<td>31-40%</td>
<td>6% of the time</td>
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<tr>
<td>41-100%</td>
<td>6% of the time</td>
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</table>

*4% in 1950*

*24% in 1998*

*There is no single “best” amount of old forest from an ecological point of view.*
Natural Range of Old Forest

Landscape A

- 1950: 4%
- 1998: 24%

Percent Area >200 Years

Frequency
Seral-Stage NRV in Hinton Wood Products Planning

Proportion of "Old" Mixedwood

10-year Time-steps

NRV

LFS Two-pass
LFS LRSYA
Weldwood One-pass
Estimated Historic Range of Lodgepole Pine Leading Forest >160 Years of Age on the Sunpine FMA

![Graph showing the estimated historic range of Lodgepole Pine leading forest >160 years of age on the Sunpine FMA. The graph displays the relative frequency of forested landscape percent against the number of occurrences. The FSC and Rollback estimate are highlighted on the graph.](image-url)
Estimated Historic Range of Lodgepole Pine Leading
Forest >160 Years of Age on the Sunpine FMA

Relative Frequency

Percent of Forested Landscape

FSC

Rollback estimate
Pine >100 Yrs Old on the Alpac FMA

Percent of Pine Forest on the Alpac FMA

Relative Frequency

60 yr fire cycle
80 yr fire cycle
12% Old Forest
Estimated Historical Frequency of Old Mixedwood Stands in the Upper Foothills Sub-region on the Hinton Wood Products FMA

- **SO:** Very large and very small percentages of old forest DO have ecological relevance at 30,000 ha.

- **Do average and range capture this?**
- **Is one scale adequate?**
Summary:

A simple question leads to several realizations:

1. We are (still) new at this.
2. The importance of asking the right question.
3. There is a logical order to NRV knowledge.
4. The importance of a shared language (of methods, definitions, indicators, etc).