Innovative Stand Enhancement and Regeneration Systems to Rehabilitate Mountain Pine Beetle Affected Stands

Boreal Sites North of Grande Prairie

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In Partnership with Canfor Alberta Operations and Spectrum Resources Group
Project Scale

7 Harvest Blocks

✓ 452 Hectares Gross Area
✓ 402 Hectares Net Area
✓ 42 Hectares Access (Roads and Landings)
✓ 10 Hectares No Harvest Control
✓ 350 Hectares Net Treatment Area
  ✓ Partial Harvest + Regenerating Treatments
  ✓ 40 Hectares Applied Research and Development
  ✓ 16 Hectares Focused Research
Project Components

- Pre-Harvest Assessments
  - Belt Transects @ Approx 3%
  - Stratification of Sites
- Layout
  - Roads, Landings and Extraction Trails
- Harvesting
  - Operator Training
  - Operational Productivity Monitoring
  - Utilized Volume/Mass Tracking
- Post-Harvest
  - Treatment Site Assessments
  - Establish Focused Research Plot Locations

- Site Preparation
  - Operator Training
  - Operational Productivity Monitoring
  - Post Treatment Assessments
- Focused Research Plots
  - Layout
  - Planting and Establishment Assessments
- Regeneration
  - Operational and Applied Research Planting
- Post-Establishment
  - Regeneration and Retention Assessments
  - Technology Transfer

CANFOR
Canadian Wood Fibre Centre
Working together to optimize wood fibre value – creating forest sector solutions with FPInnovations
# Harvest Matrix

<table>
<thead>
<tr>
<th>Stand Description</th>
<th>Treatment Options</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
</tr>
<tr>
<td><strong>Lodgepole Pine</strong></td>
<td>&gt; 80%</td>
</tr>
<tr>
<td><strong>Other Overstory Species</strong></td>
<td>N/A</td>
</tr>
<tr>
<td><strong>Mortality</strong></td>
<td>&gt; 50%</td>
</tr>
<tr>
<td><strong>Site</strong></td>
<td>Mesic</td>
</tr>
<tr>
<td><strong>Understory</strong></td>
<td>&gt; 30% Coniferous</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Harvest Treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Type</strong></td>
</tr>
<tr>
<td><strong>Design</strong></td>
</tr>
<tr>
<td><strong>Retention Level</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Site Preparation Treatments</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Treatment 1</strong></td>
</tr>
<tr>
<td><strong>Treatment 2</strong></td>
</tr>
<tr>
<td><strong>Treatment 3</strong></td>
</tr>
<tr>
<td><strong>Treatment 4</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Regeneration Methods</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>LFN</strong></td>
</tr>
<tr>
<td><strong>Plant White Spruce</strong></td>
</tr>
<tr>
<td><strong>Plant Lodgepole Pine</strong></td>
</tr>
</tbody>
</table>
Harvest Design

- Flexible for Use in Wide Range of Sites
- Suitable for Various Harvesting Systems
- Easily Implemented to Create Targeted Residual Stand Characteristics
- Cost Effective
Harvest Design
Harvest Design

- Extraction Trail
- 15m Wide Retention Strip
- 20m
- Landing (Not Bladed)
  - Stems skidded and piled with butts adjacent to access road for delimming and sorting
- Access Road (Bladed Surface)
  - Standing Trees (Various Species)
  - Extraction Trails
  - All Stems Harvested
  - Retention Strips
  - Only Merchantable Stems Harvested

Post-Harvest
Product Sort and Marketing

✓ Multiple Product Options
  ✓ Sawlogs
  ✓ Pulp
    ✓ Coniferous
    ✓ Deciduous
  ✓ Biomass
✓ Depending on Available Markets
✓ Income Used to Offset Project Costs
Innovative Biomass Processing

Chipper
Mulching Head
High Compaction Baling System
Innovative Biomass Processing

800-1000kg Bales

Easy, Cost Effective Handling
## Developmental Site Preparation Strategy

<table>
<thead>
<tr>
<th>Treatment Type</th>
<th>Scalp Patch</th>
<th>Inverted Patch</th>
<th>Mix Patch</th>
<th>No Prep</th>
</tr>
</thead>
<tbody>
<tr>
<td>Harvesting Method</td>
<td>Partial and No Harvest</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pattern</td>
<td>Intermittent Patch (1m X 1m)</td>
<td></td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>Plantable Spots</td>
<td>1000-1200 Per Hectare</td>
<td></td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>Prime-mover</td>
<td>Excavator or Tracked Skidsteer</td>
<td>Excavator</td>
<td>Excavator or Tracked Skidsteer</td>
<td>N/A</td>
</tr>
<tr>
<td>Microsite Description</td>
<td>Removal of the LFH, exposing mineral soil</td>
<td>Removal of L, invert FH and 4-10 cm of mineral soil.</td>
<td>15-20 cm high speed horizontal mix</td>
<td>Natural Forest Floor</td>
</tr>
</tbody>
</table>
Developmental Site Preparation Strategy
Focused Research Component

- Establishment and Operations - CWFC
- Focused Research – University of Alberta*
  - Vic Lieffers - Regeneration
  - Mike Flannigan – Fire Risks
  - Nadir Erbilgin - MPB
  - Ellen MacDonald – Silviculture

*Linked to “Beyond Beetle” Project
Thank-You!

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