Challenges and Strategies for Salvaging Timber from Fire Damaged Stands – a Residual Fibre Perspective

Forest Resources Association
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Jason Mattioli,
Fibre Supply Manager,
West Fraser
Overview

- Magnitude of the 2017 Wildfires
- High Level Planning, Retention and Salvaging Considerations
- Shelf Life of Damaged Stands
- Salvaging Impacts on Residual Fibre
- From Planning to Pulp – the Process
  - Planning Salvage Operations
  - Harvesting and Processing
  - Log Yard and Hot Yard Handling
  - Debarking
- Managing Charcoal Dust
Magnitude of the 2017 Wildfire - Provincial

- The 2017 wildfires were the most extensive on record in BC
- Estimated 1.2 million hectares burned
- Over 22 million m³ of green timber in the timber harvesting landbase may have been burned
- An additional 12 million m³ of dead timber was also burnt

Magnitude of the 2017 Wildfire Cariboo Region

- Approximately 80% of the area affected by wildfires were in the Cariboo regions

Magnitude of the 2017 Wildfire Cariboo Region

- The three largest wildfires represent 75% of the total provincial area affected.

Post-Natural Disturbance Forest Retention Guidance – 2017 Wildfires

Guidance was provided in January 2018 to aid salvage efforts.

Amongst other guidance, the report provided:

- Recognition of the United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP)
- The severely affected timber supply areas are experiencing substantial decreases in their Allowable Annual Cuts due to mountain pine beetle
- Wildfires had negative impact on special management areas, notably Old Growth Management Areas and effects on watershed functions
- Landscape level management to maintain ecological resilience given severely impacted landscapes from other natural disturbances and salvaging
- An environmentally focused and cautious approach to planning retention during salvage logging
- Planners should focus on what to retain, rather than on what to log
- The need to plan for effective retention in short time frames to support salvage logging requires a high degree of coordination, cooperation and efficiency

Timber Considerations – Salvage Priorities

<table>
<thead>
<tr>
<th>Timber Supply Area</th>
<th>Live/Dead</th>
<th>Unburned</th>
<th>Low</th>
<th>Medium</th>
<th>High</th>
<th>Total</th>
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Table 2. Volume (000s of m$^3$) of live and dead (killed by mountain pine beetle) timber in the timber harvesting landbase affected by the 2017 wildfires, by Timber Supply Area and burn severity class.

What is Recoverable? What is Not?

- Estimate no harvest on 85% of burned area
- Estimate 60% of burned volume, based on inventory, is non recoverable
  - >50% is due to previously damaged mountain pine beetle stands
  - Balance is due to burn severity, thin vs thick bark species, retention, operability, other resource values.

- Potential salvage volume estimated at up to 15 million m³
Existing Development
Burnt
Mountain Pine Beetle Stands
Shelf Life of Burned Stands

- Derived from severity of burn, species and aspect
- Estimated shelf live of 1-4 years, with decreasing recovery
- Drought conditions during the lead up to the fires resulted in low moisture content in trees
Considerations for Salvaging Burnt Stands

• 2 Options – Chip Revenue vs No Chip Revenue

1. Harvest all stems and process through the sawmill with no chip recovery.
   • Residual chips can be sent to pellet manufacturers or bioenergy plants.
   • Must batch run these logs through the sawmill

2. Thoroughly process all logs and remove any areas of char
   • Cat faces, scars, checks, rotten knots
   • Focus on debarking in the sawmill
   • Recover chip revenue
Char in the Pulping Process

- Char Equals Off Grade
- Char cannot be bleached
- Char generally goes through screens because it is light
- Removal
  - Loose char may be screened out as fines
- Some grades are less sensitive to contamination, but...
Salvaging Operations
From Planning to Pulping, Where is the Stage of No Return?
Planning and Development Stage

• What we have to work with:
  • Anticipate no harvesting on 85% of burned areas
  • Anticipate 60% of burned volume, based on inventory, is non recoverable
  • Post-Natural Disturbance Forest Retention Guidance – 2017 Wildfires
  • Shelf live of 1-4 years

• Focus on High Recovery Stands
• Develop Harvest Plans to Utilize the Timber at the Right Time
Stands that will Deteriorate Rapidly
Douglas-fir Stands
Douglas-fir Stands
Field Crew Hazards

- Damaged root structures increase fall down risk
- Overhead hazards
- Burned off branches
- Charcoal dust
- Slippery footing
Harvesting and Processing Stage

- Feller Buncher must sort stems at the stump to separate out any stems that do not meet the required quality specifications:
  - heavily burned trees
  - char into the wood
  - dry burned stems

- Processers must buck out any unacceptable portions of the tree
  - most operations are cut to length

- Log loaders need to avoid loading unacceptable stems on trucks
Processing out Defect

• Irregular butt ends
• Cat faces
• Rotten branches
• Any areas where the wood is burned
Processing Out Defect
Managing Charcoal Dust – in the Bush

- Increasing maintenance frequency
- More frequent blow downs of equipment
Log Yard and Feeding the Sawmill

- Every person that looks at or touches a log as it comes into the site needs to be diligent on identifying charred defects
- Scaling and unloading of trucks
- Hot yard before entering the mill
- Must be a plan to segregate out any suspect logs to prevent them from entering the mill
- Set unacceptable logs aside to be batch run, where the chips are segregated
Log Yard and Feeding the Sawmill

- Douglas-fir
Log Yard and Feeding the Sawmill

- Douglas-fir
Log Yard and Feeding the Sawmill

- Spruce and Balsam
Debarking

- Most sawmills that process burnt wood have double ring debarkers
- Increased debarking arm pressures
- Lower feed speeds
- Aggressive debarker knife tips
- Water application
- Some sawmills have installed kick-out systems
- Maintenance
- Training
Debarking
Debarking
Managing Charcoal Dust – in the Sawmill

- Most modern mills have dust collection systems
- Enclosed debarkers
- Misting or water application prior to debarking
Summary

- The scale and severity of the 2017 wildfires is unprecedented.
- Impacted timber volumes are substantial.
- Salvaging efforts will be ongoing for another 2-3 years.
- The risk to chip quality and pulp grades is significant.
- Every step of the process is important to ensure objectives are met.
Questions