Creating value from woody biomass in NE Oregon

Nils D. Christoffersen
Wallowa Resources
Enterprise, Oregon

Haypen 3 stewardship contract

Biomass – (1.0”-4.9”)
23% of cut trees per acre.

Pulp fiber – (5.0”-6.9”)
33% of cut trees per acre.
Wallowa Fire Zone - Wildfire Occurrence 1955-2007
Acres Burnt and Total Cost of Suppression

Average Annual Fire Suppression Cost
1986-2007: $6.7 million per year

731,541 acres burnt since 1955; 680,705 acres (93%) have burnt since 1986.

$144 million spent in suppression since 1970; $140 million (97%) spent since 1986
>60% of the 3 national forests in eastern Oregon are at risk of catastrophic wildfire (Dec 2009)

Impact to watershed function, endangered species recovery, recreational opportunities, and jobs.

1.5 million acres targeted in USFS Eastside Restoration Strategy. Only treating 30-50,000 acres per year.

Restoration and biomass utilization = win-win-win.
Exploration of Opportunities
Figure 12-7. Cost of biomass electricity as a function of biomass fuel cost.
Approx. 85,000 GT for 5 MW
Table ES-1. Biomass supply quantity and weighted average biomass cost delivered to potential plant sites in Baker, Union and Wallowa Counties

<table>
<thead>
<tr>
<th>Supply type</th>
<th>Quantity (GT/year)</th>
<th>Average cost ($/GT delivered)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Baker County</td>
</tr>
<tr>
<td>Biomass ethanol</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Agricultural residue</td>
<td>80,009</td>
<td>35.24</td>
</tr>
<tr>
<td>Forest biomass</td>
<td>425,934</td>
<td>48.66</td>
</tr>
<tr>
<td>Mill chips</td>
<td>308,794</td>
<td>25.39</td>
</tr>
<tr>
<td>Veneer cores</td>
<td>1,458</td>
<td>12.46</td>
</tr>
<tr>
<td>Total</td>
<td>816,195</td>
<td>38.47</td>
</tr>
<tr>
<td>Biomass power</td>
<td></td>
<td></td>
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<td>Total</td>
<td>736,186</td>
<td>38.22</td>
</tr>
</tbody>
</table>
NE Oregon Biomass Assessment

Blue Mountains Assessment – Across 3 Counties

251,000 overstocked acres on USFS in commercial management zone. Timber harvesting on 16,100 acres of this area could result in a positive net value – producing an average of 9,000 GT per year over 20 years. Limited funding and markets to support thinning on remaining overstocked land (234,900 acres).

<table>
<thead>
<tr>
<th>Biomass source</th>
<th>Total overstocked area (acres)</th>
<th>Annual treated area (acres)</th>
<th>Total biomass generated (GT)</th>
<th>Annual biomass generation over a 20-year time frame (GT/year)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Timber harvest on economically viable forest land</td>
<td>16,100</td>
<td>850</td>
<td>176,316</td>
<td>8,816</td>
</tr>
<tr>
<td>Thinning overstocked forest land (assumes 10 GT/year yield)</td>
<td>234,900</td>
<td>11,745</td>
<td>2,349,000</td>
<td>117,450</td>
</tr>
<tr>
<td>Total</td>
<td>251,000</td>
<td>12,595</td>
<td>2,525,316</td>
<td>126,266</td>
</tr>
</tbody>
</table>
“Typical” forest supply chain
Integrated campus supply chain

Long saw logs directly to mill

Integrated Campus
45 miles

Short Saw & Pulp
60%

Firewood/Densified
25%

Post & pole
15%

Residuals

Everything else to Campus
Integrated Biomass Utilization

- Short saw log
- Debarker
- Post and Pole
- Whole Log Chipper
- Firewood
- Kraft chips
- Heat logs
- Local biomass boilers
- Combined Heat and Power
Restoration, Utilization, and Wealth Retention

Fuel reduction project → Byproduct and log removal = Restored condition

Firewood

Densified fire logs

And fuel to Enterprise School District

Post and pole
County-Scale Impacts

- **Employment:** 25+ on Site, More in the Woods (>1% of workforce)

- **Renewable energy**
  - Export substitution
  - Carbon reductions

- **Benefits to existing forest management**
  - Reduced forest health management costs
  - Market-based incentives
  - New supplies to existing industry