Developing Western Logging Costs as a Basis for Western Logging Cost Indices

Beth Dodson, Steve Hayes, Todd Morgan – University of Montana
Dale Greene, Shawn Baker – University of Georgia
Wood Supply Research Institute (WSRI)

- Founded in 1999, the Wood Supply Research Institute brings together all parts of the wood supply chain to address wood supply issues through research, since credible research is needed to identify the primary factors that could improve the efficiency, stability, and business successes of the total wood supply system.
  - WSRI: identifies and documents the structure and performance of the current wood supply system and identifies opportunities for improvement;
  - Investigates ways to operate more efficiently and cost-effectively;
  - Communicates research findings directly to WSRI members;
  - Publishes key findings to benefit the entire forest products industry.
Montana Researchers:

- **Beth Dodson, PE, PhD**
  - Forestry Program Director, Associate Professor, College of Forestry and Conservation
  - Background includes applied forest operations research across the western US, an MBA, and past owner of a logging company in western Oregon

- **Steve Hayes, CF**
  - Research Forester, BBER
  - Former forester for Champion International and Plum Creek Timber Company

- **Todd Morgan, CF**
  - Director of Forest Industry Research, Bureau of Business and Economic Research, School of Business
Bureau of Business and Economic Research

- Research branch of the University of Montana School of Business Administration.
- State-level industry analysis; periodic mill censuses in 11 western states.
- Logging utilization studies; six western states, measuring what goes to the mill and what stays in the woods.
- Montana Quarterly delivered log prices and mill production and wage reports.
- Biennial Logging cost survey for Montana and Idaho.
## Daily Machine Costs

<table>
<thead>
<tr>
<th></th>
<th><strong>1993 Total $/Day</strong></th>
<th><strong>2013 Total $/Day</strong></th>
<th>Change in $/Day</th>
<th>Change in %</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Feller Buncher</strong></td>
<td>$1,191</td>
<td>$1,460</td>
<td>$270</td>
<td>+23</td>
</tr>
<tr>
<td><strong>Skidder</strong></td>
<td>$710</td>
<td>$1,167</td>
<td>$457</td>
<td>+64</td>
</tr>
<tr>
<td><strong>Track Skidder</strong></td>
<td>$850</td>
<td>$1,278</td>
<td>$428</td>
<td>+50</td>
</tr>
<tr>
<td><strong>Slide-Boom Delimber</strong></td>
<td>$1,110</td>
<td>$1,533</td>
<td>$423</td>
<td>+38</td>
</tr>
<tr>
<td><strong>Loader</strong></td>
<td>$793</td>
<td>$1,125</td>
<td>$332</td>
<td>+42</td>
</tr>
</tbody>
</table>

**Champion International cost data, adjusted for inflation**

Estimating Harvesting Costs
Steven W. Hayes, CF, Charles E. Keegan III and Todd A. Morgan, CF

Introduction
The Bureau of Business and Economic Research at the University of Montana-Missoula is conducting an ongoing logging cost survey to characterize Montana and northern Idaho timber harvest costs.

Objectives
This study characterizes Montana and northern Idaho timber harvest costs by:

- Updating stump-to-loaded truck cost estimates for several timber harvest systems using expert opinion derived costs
- Quantifying costs for increases or decreases in fuel, labor, insurance, parts and other cost factors affecting harvest to a 2013 cost basis
- Quantifying the effects of tree size and skidding, yarding, distances with a constant harvest volume per acre

Methods
A survey was mailed to over 400 independent logging contractors and timber harvesting companies in Montana and northern Idaho asking for cost estimates for several timber harvest systems. Contractors responding to the survey were offered continuing education credits through the Montana Logging Association or Idaho’s Associated Logging Contractors Inc. Three scenarios: whole tree ground based (figure 1), whole tree cable/skyline based (figure 2), cut to length in woods processed (figure 3) were presented.

The Survey participants were presented with a silvicultural/harvest prescription and asked to prepare a cost estimate or bid for each scenario (Table 1)

Table 1. Variables used to determine costs included:

<table>
<thead>
<tr>
<th>Variable</th>
<th>Average value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average skidding distance</td>
<td>600 feet</td>
</tr>
<tr>
<td>Average yarding distance</td>
<td>800 feet</td>
</tr>
<tr>
<td>Average Forwarding distance</td>
<td>1000 feet</td>
</tr>
<tr>
<td>Average DBH removed</td>
<td>13 inches</td>
</tr>
<tr>
<td>Trees per acre removed</td>
<td>42 (partial cut)</td>
</tr>
<tr>
<td>Cubic foot volume of average tree</td>
<td>24</td>
</tr>
<tr>
<td>Volume removed per acre</td>
<td>1,000 ft³ (30 green tons)</td>
</tr>
<tr>
<td>Overall harvest acres treated</td>
<td>40-80 acres</td>
</tr>
</tbody>
</table>

Literature Cited:

SURVEY RESPONSE COMMENTS
- Our costs are way up; payroll and health insurance for our employees, fuel and repairs are taking all we make; can't log for any less.
- Overall rates/costs are too low, especially with the cost of fuel and parts going up.
- Changes in fuel costs affect logging costs directly, 10% change in fuel = 2.5% change in logging costs.
- Sometimes there are a number of overlooked conditions that have more effect on expenses vs. production than the obvious ones of TPV/diameter/distance.
- There are very few equipment operators left that can do the job right and that care about what they do. So with the cost of fuel, parts, labor, insurance and work comp you barely break even at the current logging prices. If you add in a new equipment payment you would go broke.
- Political policy and federal regulation has sent this industry into a deliberate yet totally unnecessary tallpop-shame-shame-shame!
Why a Logging Cost Index

- **Machine rates**
  - As presented, not built with specific enough inputs to be relied upon
  - Do not consider production
  - Do not consider other costs: mobilization, crew transport, etc.

- **Estimates from expert opinion surveys**
  - Do not separate changes in logging rates due to cost factors vs. production factors
Background

- In 2012 UGA developed a logging cost index for the Southeastern US
- Index is updated quarterly using publicly available information
- UM is continuing this work, in cooperation with UGA, to develop indices for the Western US: (ID, MT, OR, WA)
Objectives

- Evaluate the stump-to-truck (cut and load) logging cost for the most common logging systems in the western US;
- Compare cost structures for contractors on the west-side versus east-side of the Cascade range to determine if these two regions can be combined into a single logging cost index; and
- Develop the basis for a logging cost index for the western US working closely with UGA to ensure the validation methods they are proposing to develop will also work in the refinement of a western logging cost index over time.
Stump-to-Truck Costs

- Interview 20-25 contractors in each western region
  - Business-level details
  - Operating details
  - Detailed cost information per standardized cost categories for 2012 and 2013

- This will allow for a categorization of cost components for logging expenses
Cost Components – 2011 (UGA)

- Contract Labor
- Hauling
- Insurance
- Administrative
- Fuel and Consumables
- Repair and Maintenance
- Interest
- Depreciation
- Labor

$-
$5.00
$10.00
$15.00
$20.00
$25.00
$30.00
$35.00
$40.00

$/ton

South
West
# West-side vs. East-side

<table>
<thead>
<tr>
<th>Factor</th>
<th>West-side</th>
<th>East-side</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Predominant silviculture</strong></td>
<td>Clear-cut</td>
<td>Partial cut</td>
</tr>
<tr>
<td><strong>Major logging system</strong></td>
<td>Cable with some ground-based (shovel)</td>
<td>Mechanical whole-tree</td>
</tr>
<tr>
<td><strong>Distance to mill/market</strong></td>
<td>Generally less than 50 miles</td>
<td>30-250 miles</td>
</tr>
<tr>
<td><strong>Number of sorts/destinations</strong></td>
<td>3-7</td>
<td>1-2</td>
</tr>
<tr>
<td><strong>Work year</strong></td>
<td>11-12 months</td>
<td>8-9 months</td>
</tr>
<tr>
<td><strong>Cutting</strong></td>
<td>Most often contracted</td>
<td>Most often in-house, some contracted</td>
</tr>
<tr>
<td><strong>Skidding, processing, and loading</strong></td>
<td>In-house</td>
<td>Mix of contracted (to individual owner/operator) and in-house</td>
</tr>
</tbody>
</table>

- Can we combine west- and east-side costs to produce a single index?
Use Costs for the Basis of an Index

- Unlike the southeast, there is no historic logging cost dataset that can be used to calibrate an index.
- We will be relying on UGA’s index for the SE and current validation efforts to begin the process of index development for the western US.
- A full, reliable index for the western US will take several years to fully develop.
Request for Participants

- Currently seeking contractor willing to share business and cost data
- Two-part interview process
  - In-person or phone interview to gather business demographic information
  - Collect categorized cost data for last two years
    - Note: no revenue data will be collected
- All data will be held in strict confidence
  - Published reports will only include aggregated data
Unanswered Questions

- How do wide swings in volume/acre and production impact costs?
- How much of an impact does volume/acre removed have on daily production rates?
- How do fixed and variable costs track with daily production rate?
- Can we adequately represent logging costs indexed to $/ton?

- Ask participants (SE and West) to provide weekly production rates for the past year
Questions?

Contact Us!

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