Estimating Harvesting Costs

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Introduction

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

Objectives

This study characterizes Montana 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 2017 cost basis
- Quantifying the effects of tree size and skidding, yarding, distances with a constant harvest volume per acre

Methods

2017 was the fifth time since 2009 the survey was mailed to over 250 independent logging contractors and timber harvesting companies in Montana asking for cost estimates for several timber harvest systems. Contractors responding to the survey were offered continuing education credits through the Montana Logging Association. 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:

Average skidding distance	600 feet
Average yarding distance	800 feet
Average Forwarding distance	1000 feet
Average DBH removed	13 inches
Trees per acre removed	42 (partial cut)
Cubic foot volume of average tree	24
Volume removed per acre	1,000 ft^3 (30 green tons)
Overall harvest acres treated	40-80 acres

Figure 1. Ground Based System

All costs in 2017 dollars

	$/Green Ton					$/MBF	
	2009	2011	2013	2015	2017	2015	2017
Feller-buncher	$8.10	$7.56	$7.45	$8.10	$8.25	$50.24	$51.15
Skidding 600’	$6.37	$5.71	$5.92	$6.68	$6.60	$41.41	$40.92
Skidding 1,200’	$8.24	$7.12	$7.44	$8.38	$8.34	$51.97	$51.71
Skidding 1,800’	$10.22	$8.54	$9.06	$10.85	$10.53	$67.27	$65.29
Processing	$7.75	$7.13	$7.21	$7.86	$7.96	$48.71	$49.35
Loading	$3.66	$3.71	$3.65	$3.44	$3.49	$21.31	$21.64
Administration	$1.60	$1.34	$1.82	$1.81	$1.98	$11.20	$12.28
Total	$27.48	$25.45	$26.05	$27.88	$28.28	$172.86	$175.34

Figure 2. Cable System

	$/Green Ton					$/MBF	
	2009	2011	2013	2015	2017	2015	2017
Hand-Felling	$5.55	$5.20	$4.78	$4.61	$5.12	$28.61	$31.74
Yarding 800’	$24.82	$24.02	$21.44	$22.54	$22.45	$139.72	$139.19
Yarding 1,600’	$29.50	$29.60	$23.63	$26.06	$27.06	$161.55	$167.77
Yarding 2,000’	$33.95	$32.23	$25.04	$28.91	$29.31	$179.21	$181.72
Processing	$7.85	$7.27	$7.11	$8.01	$8.19	$49.67	$50.78
Loading	$3.64	$3.59	$3.52	$3.71	$3.80	$22.98	$23.56
Administration	$2.03	$1.77	$1.75	$1.71	$1.74	$10.62	$10.79
Total	$43.90	$41.84	$38.60	$40.58	$41.30	$251.60	$256.06

Figure 3. Cut-to-length System

	$/Green Ton					$/MBF	
	2009	2011	2013	2015*	2017*	2015	2017
Harvester	$15.14	$12.96	$15.13	$16.07	$15.88	$99.66	$98.46
Forwarding 1,000'	$10.96	$9.26	$10.31	$11.52	$13.17	$71.43	$81.65
Forwarding 2,000'	$15.44	$11.44	$15.34	$13.04	$14.76	$80.84	$91.51
Forwarding 3,000'	$18.98	$15.25	$17.98	$16.65	$18.54	$103.24	$114.95
Loading	$3.97	$3.68	$4.13	$4.06	$4.05	$25.15	$25.11
Administration	$1.70	$1.40	$2.01	$1.75	$1.85	$10.88	$11.47
Total	$31.77	$27.30	$31.58	$33.41	$34.95	$207.14	$216.69

All costs in 2017 dollars

* 2015 and 2017 CTL costs calculated since no surveys were returned

RESULTS

- 2017 reported stump to loaded truck costs ranged from $28.28 per green ton for ground based systems employing whole tree skidding to $34.95 for cut to length and $41.30 for cable systems based on Table 1 harvest characteristics.
- Results indicate that smaller-diameter trees and longer skidding/yarding distances tend to increase costs and that cable systems are more expensive than ground-based systems.
- 2017 reported logging costs were higher than 2015 but lower than some previous survey years based costs, despite higher fuel and other operating costs.
- Lower harvesting costs are due primarily to attempts by loggers to continue operating in a competitive economic market. With improving delivered log prices some increases in logging cost are expected.
- Loggers felt “The 2009/2011 rates are not sustainable and contractors were bidding to maintain a viable core business & crew at minimal profit levels.”
- Because of the survey’s simplicity and repeatability, results can be compared with previous (Keegan et al. 1995, 2002) and future cost surveys to examine the impacts through time of changing fuel costs, harvest characteristics, or other items of interest.

SURVEY RESPONSE COMMENTS

- … our costs are way up; payroll and health insurance for our employees, fuel and repairs are taking all what 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 TPA/diameter/distance.
- Every job is so different that giving you our cost would be a wild guess.
- 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 tailspin-shame-shame-shame!

Literature Cited:

Keegan, C.E., and J. Halbrook. Harvest Cost, Employment and Labor Income Estimates for Montana’s Forest Products Industry. 2006. Missoula, MT: The University of Montana, Bureau of Business and Economic Research.

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