Pacific Northwest Research Note

Forest and Range Experiment Station · U.S. DEPARTMENT OF AGRICULTURE · FOREST SERVICE

Number 138 Portland, Oregon February 1957

SKIDDING WITH HORSES TO THIN YOUNG STANDS IN WESTERN WASHINGTON

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Increased use of commercial thinning to provide an additional source of needed raw material and to boost overall yields from forest lands has again brought horses into the northwest woods. They are particularly well adapted to skidding small logs under the light, frequent cuts typical of a thinning operation. Horses can, moreover, work at close quarters in a young stand without seriously damaging residual trees and reproduction. In many stands, the advantage of minimum damage coupled with low initial investment and overhead costs will more than offset the disadvantages of care required when horses are not working and the physical limitations of horse logging when skidding distances are long or uphill. As utilization of small-sized thinning material becomes more profitable and more widespread, interest in horse skidding is destined to increase.

Skidding Operation

To be successful, horse skidding should be used only where advantages of this method can be fully utilized. External skidding distance should usually not exceed 500-600 feet. Likewise, average skidding distance should not exceed 300 feet. 1/ Costs increase

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1/ Worthington, Norman P., and Shaw, Elmer W. Cost of thinning young Douglas-fir. Timberman 53(10):136-138.

Figure 1.--A 1,500-pound horse, skidding a 24-foot mine prop that was cut in a light thinning of a 40-year-old Douglas-fir stand. Voight Creek Experimental Forest, Washington.

rapidly with longer distances. Skidding downhill on slopes as steep as 40 percent appears feasible, but adverse slopes exceeding 10 percent limit skidding to under 300 feet. One medium-sized horse (1,400-1,600 pounds) is best for handling small logs from thinnings. Larger horses are slower and less effective, particularly on steep ground. One horse gives adequate traction, requires less swamping, has greater mobility, and is less costly than a team (fig. 1). However, a team may be required for handling logs over 30 inches in diameter. 2/ Experience has shown that skidding is much cheaper during second and subsequent thinnings since original skid roads and swamped trails can be re-used.

A typical skidding unit is one man and a horse, the teamster being responsible for care of his horse. Normally, he skids the products to roadside and decks or arranges the logs or bolts for

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2/ Jeffers, Nelson. We use hay burners. The Lumberman 82:72-74. 1955.

subsequent loading (fig. 2). Skidding requires little supervision and is a relatively easy job to sub-let or contract by piece rate. Output is dependent upon individual skill of both man and horse. In a year, one skidding unit can thin an estimated 125-150 acres, averaging 7 cords per acre. One operator who uses horses extensively estimates 165 acres per year per skidding unit. 3/

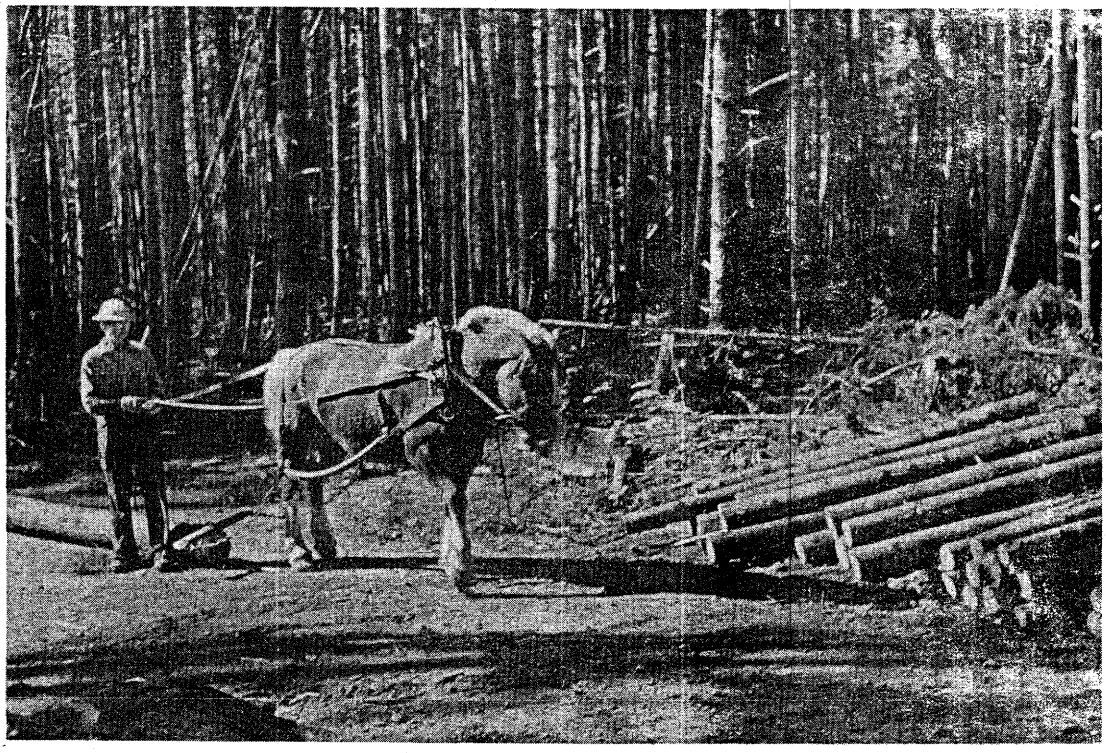

Figure 2.--Decking 8-foot Douglas-fir pulpwood along the roadside for later lift-truck loading. Voight Creek Experimental Forest, Washington.

For skidding distances under 500 feet, anti-friction devices are unnecessary. A log chain with a slip hook at one end and a grab hook at the other is commonly used for attaching the log to the singletree, although for larger products a pair of skidding tongs may prove useful. Extraction in log lengths up to 32 feet is best, particularly for small trees. However, shorter lengths may be necessary for heavier material.

3/ Ibid.

Skidding Costs

Cost records have been collected over a 6-year period by the Puget Sound Research Center for horse-skidding jobs on both experimental- and national-forest thinning projects. Costs varied with size of tree, skidding distance, terrain, and skill of teamster and horse. However, they are indicative of the range that can be expected. The complete record (table 1) covers 2,886 cords of timber harvested from approximately 300 acres and represents actual experience on commercial jobs. Skidding distances averaged approximately 300 feet, with maximum distance 750 feet. Costs include teamster's wages, horse costs, taxes, supervision, and overhead expense. A uniform teamster's wage of $2 per hour was used, although payment was on piece rate in most instances. Wages amounted to approximately 75 percent of the combined teamster and horse skidding rate. Costs shown should be easy to duplicate at other locations under similar conditions.

The operation with the highest skidding cost (Voight Creek, 1949-50) had a company crew and represents a significant variation from normal contract work. The Snoqualmie and Olympic operations handled 16- to 24-foot sawtimber; the others, either 8-foot pulpwood or logs, except at Voight Creek (1949-50) where considerable smelter poles were produced.

Skidding with horses to thin young stands costs between $4 and $6.50 per cord under normal operating conditions. Daily production should fall between 3.5 and 6 cords for a man using a single horse. Based on today's pulpwood prices, it is apparent that horse skidding can be a profitable operation.

Horse Maintenance Costs

In the Pacific Northwest, costs of feeding and otherwise maintaining a horse for woods skidding are not well documented. The few published records fail to separate these costs from total skidding cost. However, data gathered over the 6-year period of this study (table 2), supplemented by the operator's knowledge of local conditions, should give a reasonable estimate of maintenance costs when horses are used for thinning Douglas-fir and hemlock.

The cost of operating a single skidding horse approximates 40-45 cents per hour with a good deal of uniformity among three of the four examples. The low cost in the Voight Creek operation is

Table 1.--Cost of horse skidding, with supporting information, for experimental- and national-forest thinning projects in western Washington

Item	Voight Creek[1] 1949-50	Snoqualmie[2] 1950	Olympic[2] 1950-51	Voight Creek[1] 1953-54	Hemlock[3] 1955-56
Cost per cord...dollars	7.64	3.93	5.12	6.40	4.26
Proportion skidding bears to total logging cost..... percent	38	24	33	38	31
Total volume skidded .... cords	1,627	190	257	278	534
Av. tree cut....d.b.h, inches	9-13	19	14	8-11	11
Cut per acre... cords	16	11	9	5	9
Production per day, per skidding unit....cords	2.80	6.08	5.12	3.44	5.36

1/ Maintained jointly in Pierce County, Wash., by St. Paul and Tacoma Lumber Company and the U.S. Forest Service.

2/ U. S. national forest.

3/ Maintained jointly in Grays Harbor County, Wash., by the St. Regis Paper Company and the U.S. Forest Service.

Table 2. --Estimated annual maintenance cost for a horse used to thin young stands in western Washington

Item	Voight Creek 1949-50	Snoqualmie 1950	Olympic 1950-51	Hemlock 1955-56
	------- Dollars -------			
Feed	307.86	409.20	504.75	521.56
Harness and equipment	18.82	105.42	93.50	38.48
Shoeing	31.28	49.34	28.00	37.96
Veterinary service	16.32	25.00	25.00	20.00
Shelter	7.58	25.00	25.00	20.00
Depreciation of horse[1/]	20.00	23.12	37.50	25.00
Taxes, insurance, and interest	10.00	20.00	15.00	10.00
Miscellaneous	25.00	15.00	15.00	10.00
Total	436.86	672.08	743.75	683.00
Cost per horse-hour (based on 1,600 hours of actual use)	.273	.420	.465	.427

1/ Working life, 4 years; initial cost $100 to $175, less salvage $25.

partly attributed to frequent periods of non-use, when the horses were pastured without a feed charge. Also, costs of feed in the Voight Creek thinning were lower than in the other three use studies. Costs do not include service labor for feeding, which is included under teamster's wages. Care of horses over prolonged periods of non-use would tend to increase overall maintenance costs. On some jobs, the time required for weekend care is reduced by leaving sufficient feed on Friday night to suffice for a 2-day period.

Summary

Several studies of commercial thinning in young stands of Douglas-fir and western hemlock on national forests and experimental forests in western Washington show the possibilities of horse skidding for distances under 600 feet. Costs of skidding both pulpwood and sawtimber ranged from $4 to $6.50 per cord. Daily output was 3.5 to 6 cords for one man using a single horse. Cost of operating a single skidding horse approximated 40-45 cents per hour, based on a 1,600-hour work year.