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GRAPPLE YARDING BURNED TIMBER IN NORTH-CENTRAL ALBERTA

Introduction

Large forest fires in north-central Alberta during the spring and summer of 1998 damaged thousands of hectares of forest. Salvaging this burned timber has been a major focus for forest companies operating in the region. Reduced government stumpage charges, the large volume of burned timber, and the need to salvage the timber before it degrades, have created opportunities for companies to try alternative harvesting methods. Grapple yarding is one such method being used by Millar Western Forest Products Ltd., Whitecourt Division. This is the sixth in a series of Field Notes that the Forest Engineering Research Institute of Canada (FERIC) is publishing describing how forest companies are utilizing and processing burned timber. Alberta Environmental Protection provided funding for this study.

Site and Machine Description

A large wildfire in the Virginia Hills, northwest of Whitecourt, Alberta, has left thousands of hectares of burned timber to be salvaged. The topography of the Virginia Hills is primarily gentle low rolling hills interspersed with extensive level terrain. However, there are hills with steep side slopes, gullies with abrupt, sloped sidewalls, and watercourses classified as riparian zones. Geotechnical assessments in many of these areas recommended no ground-based skidding because of a high risk of damage to the site. Therefore, Millar Western's Woodlands staff and geotechnical engineers concluded that grapple yarding would be an environmentally acceptable and economically feasible method for harvesting these sensitive areas.

Stands in the harvested area were a mixture of spruce and pine with an average stem volume of 0.7 m³. Fire had scorched the trees from the ground to the crown, creating heavily blackened stems.

A Timberjack 2628 self-leveling feller-buncher felled and bunched the timber parallel to the slope. Hand falling was used on very steep terrain beyond the Timberjack's capability. The tree length stems were yarded and decked at roadside by a Madill 122 grapple swing yarder (Figure 1). The decked stems were processed at roadside to tree length logs using a Pierce

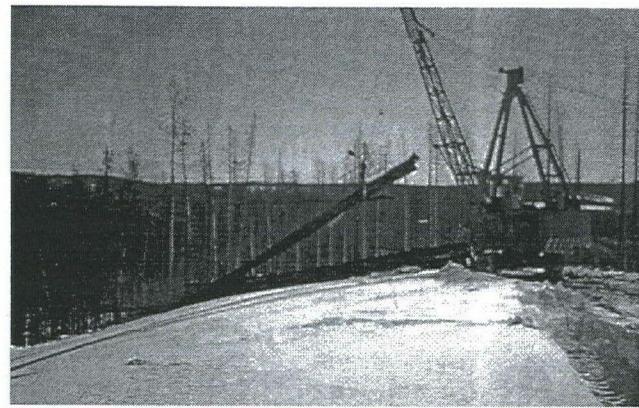


Figure 1. Madill 122 grapple yarder.

230 processor mounted on a Caterpillar 322. The yarding system used a Hitachi EX 300 excavator as a mobile backspur and a Caterpillar D8 crawler tractor to guy the yarder. The yarding crew consisted of one yarding engineer and a spotter. The spotter moved the backspur and, when required, communicated with the engineer to help position the grapple over the bunched stems to enable efficient grappling. The yarder can operate at night where the floodlights provide good visibility over the entire yarding road. Problems occur in gullies and draws as the floodlights do not create adequate light.

The processor piled the logs directly on the road because of the small working area, the large log size, the height and angle of the decked wood, and the type of processor. After processing, a log loader moved the logs, decking them beside the road to facilitate loading and log hauling.

Discussion

The contractor, Dan Steichert of Dan-O Contracting Ltd., stated that production in the block was averaging 300–400 m³ per 10-hour shift.

A number of factors contributed to good grapple yarder productivity. These include large piece size, bunching of stems parallel to the slope, good deflection, and a mobile backspur and guying system. To improve stem-processing productivity, the contractor stated he would like to use a stroke delimber, a machine better suited to

manufacturing long logs from large stems. The use of this machine would also allow the processed logs to be decked off the road, eliminating the need for the loader to re-deck the logs.

FERIC observed the Madill yarding uphill on a 35% slope with excellent deflection. A sample of the decked logs showed an average butt diameter of 34 cm.

Stem tops and branches were easily broken and appeared brittle when being yarded. Although this was not quantified, FERIC attributed the brittleness to increased stem dryness in the fire-killed timber.

Conclusion

The need to salvage fire-killed timber has led Millar Western Forest Products Ltd., Whitecourt Division, to consider alternative harvesting methods. Grapple yarding has enabled the company to harvest areas that were classified as inoperable under conventional ground-based skidding.

Average grapple yarder productivity of 300–400 m³ per 10-hour shift can be attributed, in part, to large piece size, mobile backspar and guying systems, stems bunched parallel to the slope, and adequate deflection.

Disclaimer

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