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Field Note No.: Felling-17

## MORBARK WOLVERINE FELLER-BUNCHER: OBSERVATIONS

### INTRODUCTION

Feller-bunchers have been widely used in the past 15 years as a harvesting tool in the Interior of British Columbia. However, for an increasing number of low quality, small-diameter pine stands now being harvested, the felling cost using conventional feller-bunchers can be unacceptably high. Smaller, less expensive feller-bunchers could economically be a better choice. In January 1992, the Forest Engineering Research Institute of Canada (FERIC) observed such an alternative machine, the Morbark Wolverine, equipped with a new Morbark high-speed saw (Figure 1). The machine was working in a small-diameter (20-25 cm) lodgepole pine stand south of Vanderhoof, British Columbia. This Field Note illustrates FERIC's observations of the Morbark Wolverine operating in this marginal-value pine stand.

### MACHINE DESCRIPTION

The Wolverine is manufactured by Morbark Forestry Products, Inc. of Winn, Michigan. It is distributed in the northwest by Finning Ltd. in British Columbia and by Morbark Northwest Inc. of Toledo, Washington. The Wolverine carrier is a rubber-tired machine with three wheels. It has two large, hydrostatically driven tires in the front, which are powered independently of each other, and one freewheeling small tire at the rear. This



Figure 1. Morbark Wolverine equipped with Morbark high-speed saw.

wheel arrangement enables the machine to turn completely around within its own length. The Wolverine is available from Finning Ltd. with two engine configurations. The standard engine is a Perkins 1006-6 diesel with 99 kW (133 hp), or a Perkins 1006-6 turbo diesel with 123 kW (165 hp). Hydraulic power is supplied by two hydraulic pumps with capacities of 94.6 L/min each at 21 MPa. The operational weight of the machine without attachments is only 6700 kg. A Morbark Wolverine equipped with a disc-saw bunching head and 123-kW (165-hp) standard turbo diesel engine sells for approximately C\$172 000.

The Wolverine can be configured for a wide variety of forestry and millyard applications. The unit FERIC observed was equipped with a high-speed, low-torque disc saw. The saw is rated for cutting trees up to 45 cm in diameter, although this was not observed. The cutting head was mounted on a fixed boom, requiring the feller-buncher to position itself in front of each tree before cutting. The machine's ability to quickly manoeuvre between trees in the stand is therefore very important for high felling production.

### OBSERVATIONS

The Morbark Wolverine viewed by FERIC was owned by Fred Albertson, who subcontracts for Gulbranson Logging of Vanderhoof, B.C. The harvesting operation in which the Wolverine was working consisted of four machines: the Morbark Wolverine, a Case 1187 feller-buncher equipped with a cone-saw felling head, a Komatsu excavator with a Denis DP550 processor, and a Clark Ranger grapple skidder.

The stand in which the Wolverine was working consisted of small-diameter lodgepole pine (20-25 cm) with an average piece size of 0.15 m<sup>3</sup> and volume of 200 m<sup>3</sup>/ha. The terrain was generally flat and rolling, ideal for this machine. The snow depth at the time of the study was approximately 18 cm but did not appear to adversely affect production; however, the machine may have got stuck if the snow had been deeper.

The felling cycle involves driving the machine to a tree, lowering the saw to the desired cut height, and then driving the machine forward to sever the stem. Stems are collected in the buncher accumulator until it is full, then the operator spins the machine around, aligns the bunch for skidding, and lowers it to the ground by tilting the felling head. The accumulator on the head was observed collecting up to six trees before setting them into a bunch. Because the felling head was equipped with a high-speed, low-torque saw, the blade slowed considerably while cutting through trees greater than 20 cm in diameter. Modifications made to the saw's hydraulics since FERIC's observation reportedly now allow the saw blade to cut through these larger trees without significant slowing. Production figures were unavailable at the time of the study because the operator had only run the machine for two days.

Although the 3-wheel design provides good manoeuvrability, it has the disadvantage of reducing machine stability on slopes greater than 20%. This problem was observed to be magnified when the accumulator was full. The operator reported the machine ride to be comparable to that of a rubber-tired skidder working on average Interior terrain. The operator's seat in the Wolverine is adjustable six ways, and is situated to provide good visibility through the front and side windows.

## CONCLUSION

The Morbark Wolverine feller-buncher viewed by FERIC worked effectively with the small-diameter pine stems on gentle terrain. On steep terrain (>20%), some instability was observed, especially when the machine travelled with stems in its accumulator. Also, the felling saw lost velocity quickly when felling trees larger than 20 cm in diameter, although the manufacturer has reportedly since improved the hydraulic system to overcome this problem.

Based on FERIC's limited field observations of the Morbark Wolverine, this machine appears to be an acceptable alternative to conventional feller-bunchers for small-diameter stands on relatively gentle terrain.

## INFORMATION

The information contained in this report is based on limited field observations and is published solely to disseminate information to FERIC members. It is not intended as an endorsement or approval by FERIC of any product or service to the exclusion of others that may be suitable.

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