



STEEP SLOPE AND SAFETY: WHAT IS HAPPENING AROUND THE WORLD?

There is a shift in British Columbia and internationally toward more harvesting on increasingly steeper sites. There are several international research agencies focusing on the mechanization of steep slope operations with visions similar to that adopted by the New Zealand Forest Owners Association's Steep Land Harvesting Program: "No worker on the slope, no hand on the chainsaw." The mechanization of felling, bunching, shoveling, processing, skidding, etc. provides a protected and safer environment for forestry workers. Exposure to hazards is greatly reduced compared to manual methods.

Steep terrain winch-assist machinery for forestry has been commercially available in Europe since the 1990s and in New Zealand it was pioneered by con-

tractor Ross Wood in 2006. Subsequent developments have led to rapid growth of the technology from a concept to a true harvesting system. There are 11 winch-assist systems currently available to the forest industry in British Columbia. The technology is being rapidly implemented in an effort to improve safety and productivity with the numbers of operating machines increasing exponentially. Currently 49 machines have been purchased or planned in Western Canada (Figure 1).

Most users of winch-assist systems claim safety is their leading priority when implementing this technology. In New Zealand, approximately 10 million m³ have been harvested with winch-assist equal to potentially two lives saved based on manual falling safety statistics.

There had been no serious injuries or fatalities using these systems until June 2016 in New Zealand when a single-cable bulldozer anchor machine was pulled down the hill pinning the operator of the felling machine under the dozer. The suspected cause for the incident was mechanical winch failure.

There have also been several New Zealand cases of cable failures (both single and double-cable systems), shackle or other connection failures, anchor failures, and machine rollovers without any serious injuries. These close calls have been great opportunities to learn. FPInnovations' Steep Slope Initiative aims to facilitate international information sharing to ensure that any new safety measures and learnings are identified and communicated to BC stakeholders.

UPDATED

Did you know?

COMPANIES HAVE 3 DAYS TO REPORT AN INJURY

Industry has worked hard to reduce its prior average of 21 days to 12 days in the past year, but more needs to be done. When there is an injury at work, an employer **must** file that information with WorkSafeBC within 3 days. Prompt claim filing means the best outcomes for the injured worker and the company, saving industry tens of millions of dollars in costs. **Safety is good business.**

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WORKING TO MAKE A DIFFERENCE



Winch Machines	Western Canada		US PNW		
	Current	Planned	Current	Planned	
Climbmax	5	2		1	
ROB	7	5	1		
Haas	2	5			
HSM	2	3			
Herzog/Alpine	1	4	4		
EMS	1	4	8	8	
Summit		1	9	12	
T-Mar			1		
FFE	3	3			
T-Winch	1				
Total	22	27	23	21	93

Figure 1

Timely relevant updates are compiled through regular international conference calls and collaboration with experts from New Zealand, USA, Austria, Germany, Australia, and Chile.

There have been several international developments in safety measures for winch-assist technology based on recent learnings.

1. Rules, approved codes of practice, best practice guidelines:
 - a. New Zealand has winch-assist “regulation” within the national governmental level Approved Code of Practice
 - b. Several forest management com-

panies have developed best practice guidelines, operator training competencies and training schedules

- c. The New Zealand Forest Industry Contractors Association is developing industry-wide best practice guidelines for operation, maintenance and inspection of winch-assist equipment
- d. FPInnovations is developing Best Management Practices for BC conditions and supporting BC Forest Safety Council’s operator competencies and training initiative

e. Oregon requires a special “research variance” for operating winch-assist equipment and will likely require winch-assist for any ground-based operation on slopes steeper than 50 per cent

2. Equipment manufacturers’ manuals and guidelines—all winch-assist equipment manufacturers provide their customers with manuals, guides, and training with varying levels of comprehensiveness. Topics may include:

- a. Winch and cable tension monitoring and control
- b. Traction and stability
 - i. Charts and traction coefficient identification guides
 - ii. European winch manufacturers recommend no operation on slopes where traction cannot be maintained without the winch assistance
- c. Cable(s) and end connectors inspection and maintenance

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Find safety resources at worksafebc.com/health-safety/industries/forestry.

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long-term area-based tenures featuring shorter rotation, more intensively managed plantation forests. Forest management activities in most developed countries are well-regulated whether the land is publically or privately owned. However, public ownership can result in increased emphasis on multiple objectives with timber production and availability becoming less certain increasing business risks and associated required returns.

Initiatives aimed at providing improved certainty around issues such as confirming access to timber, timber pricing mechanisms, ensuring that the regulatory and taxation environment remains stable and competitive, etc. help to ensure businesses can make operating and capital spending decisions confidently. Fundamentally, the ability to add value to the province's timber resource requires significant capital spending across the value chain which in turn requires industry players have the scale and financial health to access capital as well as the confidence to invest.

I believe the coastal forest industry has reduced sawmilling capacity to match harvest levels as much as possible and the capture of potential synergies is now at a mature stage. However, despite the fact that domestic timber prices are meaningfully below US Pacific Northwest and Japan/Asia market prices, the industry has not been able to attract significant capital in the form of new converting capacity with the exception of a few materially advantaged rotary mills. In fact, effectively all sig-

nificant converters are now effectively running for cash as they further depreciate their asset base. This situation has persisted for over 25 years and reflects the historic surplus of uncompetitive legacy assets, complexities of the coastal species and grade mix, market access challenges, and a focus on maximizing long run sustained yield by continuing to target high cost, declining quality natural stands prior to moving more substantially to second growth.

While there is a popular view that redistribution of tenure rights to a larger number of players would result in increased innovation and investment as put forward by Harry Nelson and Ngaio Hotte in their article, "Market Report: Competition and Investment in the BC Coastal Forest Industry" in the Summer 2016 issue of *Truck LoggerBC*, there is very little evidence that this would be the result.

The key to seeing more capital investment will be finding ways for the government and industry to continue to work together to improve profitability and certainty. I expect this will be challenging over the next five years owing to additional costs in accessing the US market and declining markets for residuals. All levels of government and business should be cautious of introducing any additional costs to the business.▲

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- d. Movement sensor(s) and other safety alarms
- 3. Equipment manufacturers' designs:
 - a. Emergency back-up systems (second cable, blade or other attachment, warning devices)
 - b. Software solutions to spikes in tension through better synchronization between tracks and winch
 - c. Tension monitoring and recording
 - d. Lower tension in one of the two lines in twin-line systems to ensure engineering safety redundancy in case of main cable failure
 - e. Rated components of the whole system (2:1, 3:1, or 5:1 safety factors vary by manufacturer)
 - f. Controlled release vs sudden brake in case of failure
- 4. Research:
 - a. Terrain and soil conditions and impacts on traction and stability
 - b. Use of trees to change machine direction (siwashing)
 - c. Anchor types and use of blocks
 - d. Cable tension behaviour in relation to machine activity
 - e. Extreme temperatures and the effects of snow and ice

While it may be difficult to set universal rules for winch-assist technology due to the varying nature of forestry operations—constantly changing terrain, weather, surface and stand conditions; operator experience and aptitude; economic feasibility and accessibility; social acceptance and licence, varying environmental standards—it is certain that winch-assist technology will save lives in British Columbia.▲

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