STEEP SLOPE LOGGING - BALANCING COST SAFETY AND PRODUCTION

By Jim Girvan

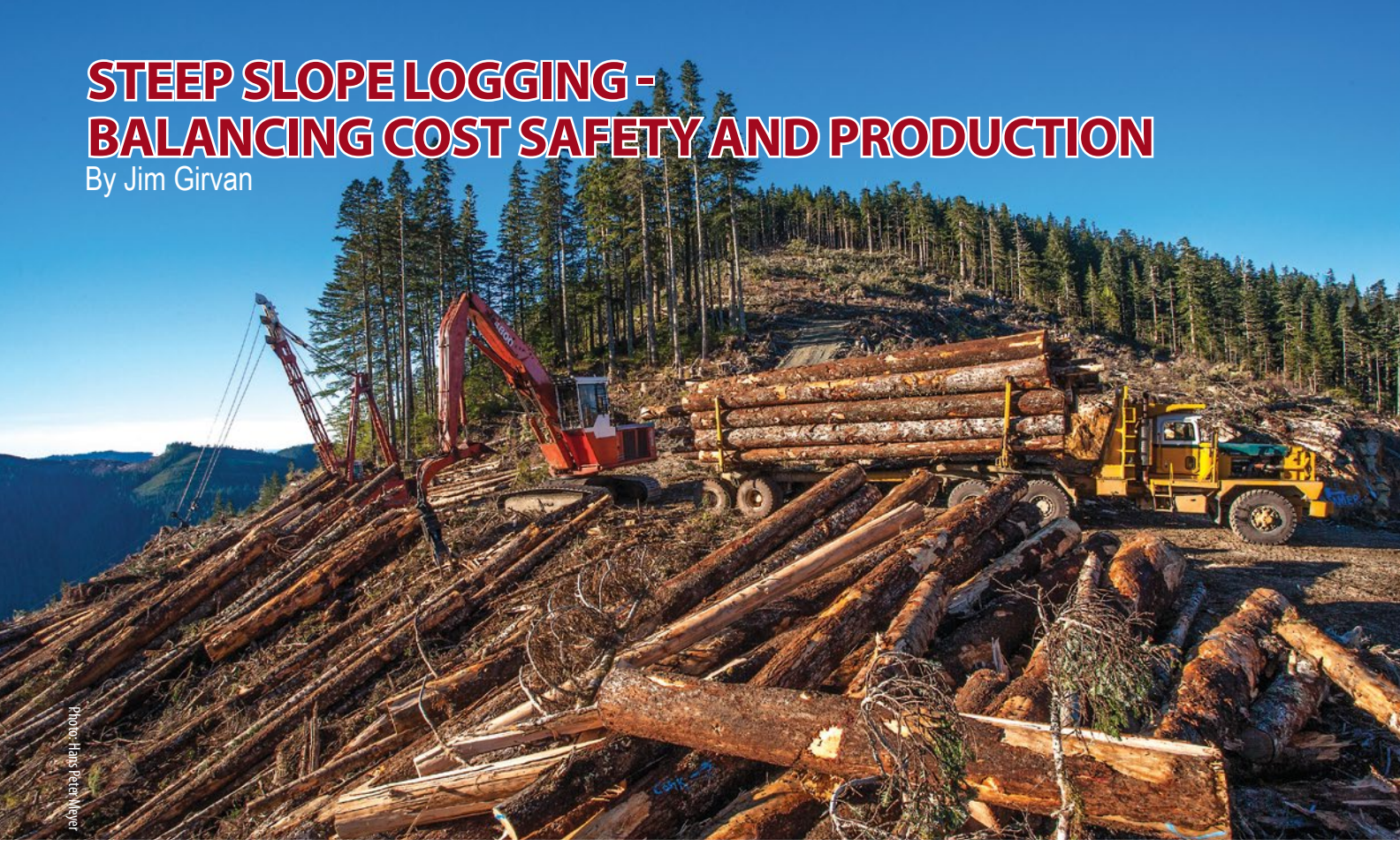


Photo: Hans Peter Meyer

It is safe to say that the New Zealand forest industry's poor safety record led to the 2013 independent joint safety review and their new Health and Safety Reform Bill. It may also have been the catalyst for the revolution in safer more mechanized steep slope harvesting technology globally (*Truck LoggerBC*, Summer 2015).

In BC, we are accessing an increasing volume of timber on steep slopes. In the Interior, the wake of the mountain pine beetle epidemic is causing this shift. On the coast, we are steadily moving to more second growth steep slope timber. This means new cost effective and safe methods for logging are needed across the province. To support this trend, the TLA is offering three panel discussions at the upcoming convention related to steep slope logging.

Global Innovation in Steep Slope Logging Technology - January 13, 8:30-10:00 am

In the Global Innovation in Steep Slope Logging Technology panel, key industry suppliers and global innovators will provide the latest equipment solutions in addressing the challenges of harvesting steep slopes.

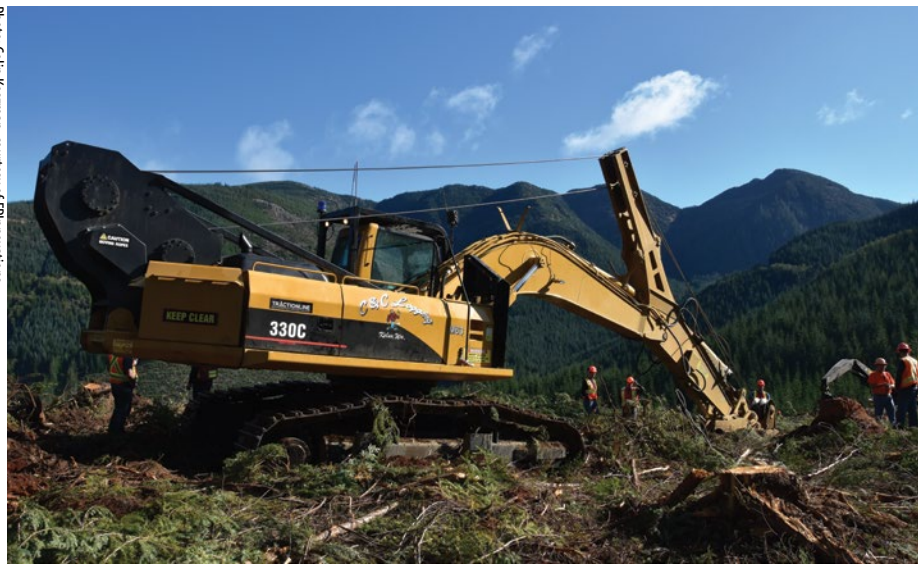
Moderator Tyson Lambert, Vice President of T-MAR Industries in Campbell River has seen first-hand the growing movement to increase mechanization on steep slopes that could lead to both increased productivity and safety. "Mechanization will also allow the industry to attract more skilled workers as it is a better job than just setting chokers. Dangerous, labour intensive jobs just don't fit the bill when we are competing with other industries for workers," notes Lambert.

"What we see with our customers is the growing application of ground-based techniques being used on steep slope applications. Ground-based forwarding doesn't work as well, however, due to issues related to soil disturbance. As a result, what we are seeing is the yarder and specifically the grapple yarder being used as a forwarder which is fundamentally changing how logging is done on steep slopes. This is the focus of current T-MAR development."

Gary MacDonald of Tigercat sees the potential to adapt its current, proven machines for use in steeper applications. "At Tigercat we are confident that we can adapt our machines to new technologies. To this end, we are working with multiple companies that are involved in manufacturing cable assist systems." Tigercat is currently working toward the goal of providing a 'cable assist ready' solution from the factory for its leveling track carriers with optimal positioning of connection points. "We believe that we need to continue to work with the current technology of our leveling machines and six-wheel drive skidders, that are already widely known for their high performance on slopes, to expand their application to steeper slopes," notes MacDonald.

Tigercat felling machines have robust cabs with four point harnesses and three escape routes. The unique geometry of the Tigercat leveling machines shifts the centre of gravity forward over the high side of the undercarriage as it inclines, to make the machines more stable on slopes. "There is more that can be done here as well," says MacDonald. "Cable assist is a next step and Tigercat has 8-10 machines working in cable assist applications globally." However as Macdonald cautions, "each of these are applications in unique circumstance and

Photo: Colin Koszman, courtesy of FPInnovations



This excavator has EMS traction line winches attached to it and the operator in the feller buncher parked below is operating it by remote control.

there is no clear or common solution yet regarding the exact style of cable assist system that will be used going forward as there are so many new ideas."

Dan Fuhrer is the factory representative for Ponsse Plc in western Canada and is responsible for sales, service and after sales support. Ponsse has thousands of machines working around the world in logging applications, with over 50 currently working on steep slopes using winch assist technology.

"What is considered steep slope logging for some, is just day-to-day operations for others," comments Fuhrer. "Conditions are different around the world and what works on some slopes may not work on others. In Oregon, we can operate our eight-wheel machines on slopes up to 70 per cent in some cases as a result of the suitable soil types and terrain."

Ponsse builds both six-wheel and eight-wheel harvesters that can be fitted with winch assist for steep slope applications. "It is not so we can go on steeper and steeper slopes," cautions Fuhrer, "it is about traversing slopes safely while limiting ground disturbance."

The big advantage of eight-wheel machines is the longer frame and eight contract points with the ground which allows for more stability and safer operations than a comparable machine on tracks. They can be used for steep slope bunching, but as Fuhrer points out, "they work best in cut-to-length applications."

Fuhrer predicts that in 25 years the economics of coastal harvesting will drive change and bunchers will be phased out in favor of cut to length harvesters. "Time will tell," notes Fuhrer.

The Challenges of Operating on Steep Slopes - January 13, 10:30 am -12:00 pm

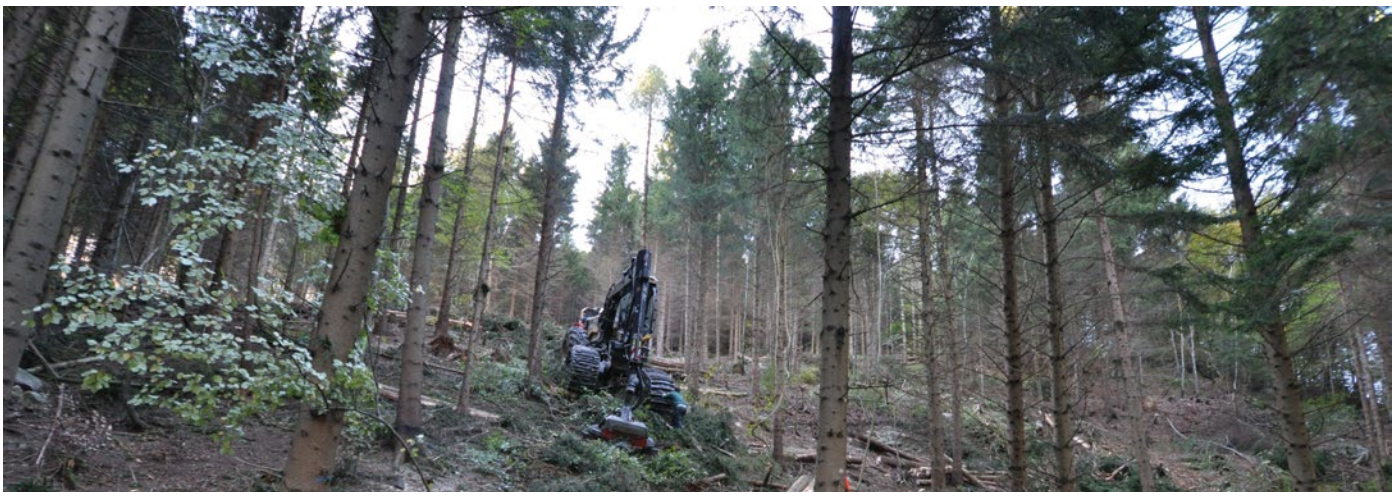
With increasing reliance on timber located on steep slopes in BC, The Challenges of Operating on Steep Slopes panel participants will provide context for the challenges ahead.

Moderator Jim Hunt is the Research Leader for the Harvesting Operations Group at FPInnovations, a national team that conducts operational harvesting studies. FPInnovations started getting feedback from members that they needed help with steep slopes demonstrating a need for research in this area.

A query to the MFLNRO Inventory Analysis Branch shows that 24 per cent of the provincial timber harvest land base is on slopes greater than 35 per cent (56 per cent on coast and 14 per cent in Interior). "Clearly we have not been logging the profile and in doing so we have deferred the more expensive steep slopes" notes Hunt. "But now we have to go there and the piece size is smaller, hence the need for research and new techniques."

FPInnovations has started a multi-year, steep slope initiative addressing harvesting, roads, transportation—all aspects of working on steep slopes with a steering committee made up of major licensees and manufacturers.

Photo: Colin Koszman, courtesy of FPInnovations



This harvester is a wheeled winch assist machine working on a 75 per cent slope in the Swiss Alps in a cut-to-length thinning operation.

"This approach helps with information sharing as we learn. We have a five year road map and with the support we are getting, we are seeing real potential," says Hunt.

There is a potential $5 per cubic metre cost reduction by increased mechanization on steep slopes together with the obvious safety benefits of getting fallers off the hills that will lead to reduced WorkSafeBC premiums as well. Clearly a win-win for the industry, according to Hunt.

"The value proposition in cost reduction and safety is undeniable and that is what is motivating FPInnovations."

Gerard Messier is the Manager of Program Development at the BC Forest Safety Council (BCFSC) echoes the need for safe operations on steep slopes. Over the past year, the BCFSC developed and operationalized their steep slope logging assessment package which is available on their website. "It is a user friendly guide to make operators aware of the issues that should be addressed to ensure safety on steep slopes," notes Messier.

But stepping back from regulations and guidelines, Messier takes a broader perspective in noting that it is important to know the equipment you have and that the proposed harvest system is right for the circumstances and that the capabilities of the people who operate it are the right fit for the slope. "The competence of workers is crucial and it

has to be assessed before putting people to work," notes Messier. "Walking the block is the most important thing you can do before you start working a machine and a worker on it."

And then there are situations we might be blind to like road construction hazards and the potential for slides. This may be more common than we realize as was highlighted in recent work by the Council. "Simply put, operating on steeper slopes requires companies to practice due diligence," notes Messier, "and if we can develop and implement simple, but effective tools and strategies to help companies do that, we will all be better off."

Jonathan Lok is the Managing Partner at Strategic Natural Resource Consultants. His company provides a full suite of forest engineering and development services across BC and is also adapting his firms' expertise and skill set to the new challenges being presented on ever steeper slopes.

"Planning for harvesting on steep slopes is key," notes Lok. "The slopes we are being asked to engineer are getting steeper and with the push to more innovative use of ground-based systems like winch assist and levelers, it is challenging for us to plan cost effectively and safely for these systems. We also have to be sure that our engineering translates to those building and using it or the limits of what we are doing can get pushed. It is also important for our engineers to see the results of their layout by seeing active harvesting. This provides a feedback loop between us and the loggers that builds our collective expertise."

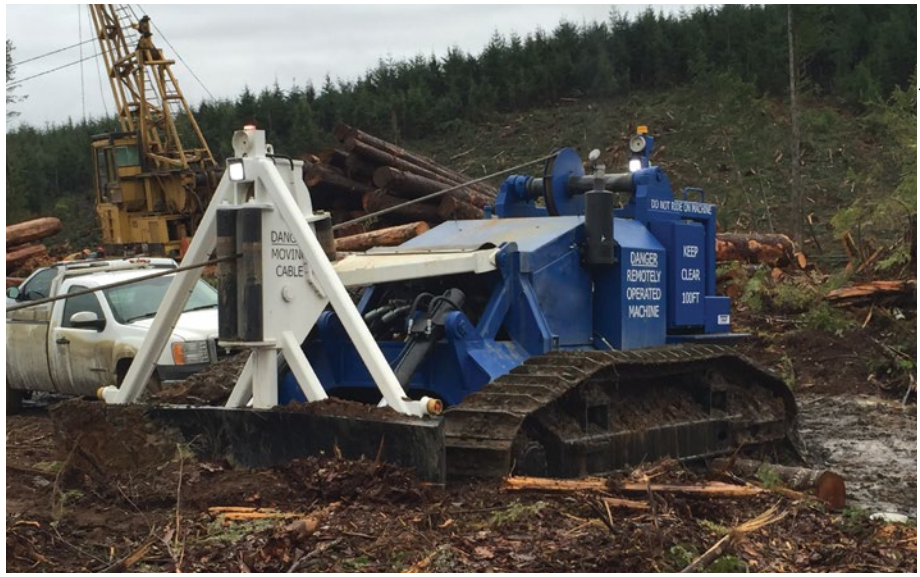


Photo: Courtesy of T-Mar Industries Ltd.

This remote controlled traction assist winch supports mechanized falling on steep slopes keeping workers off the ground and out of danger.

Mark Leitao is the Director of Operations at Island Timberlands (IT) and is responsible for all their harvesting operations. His company, like most on

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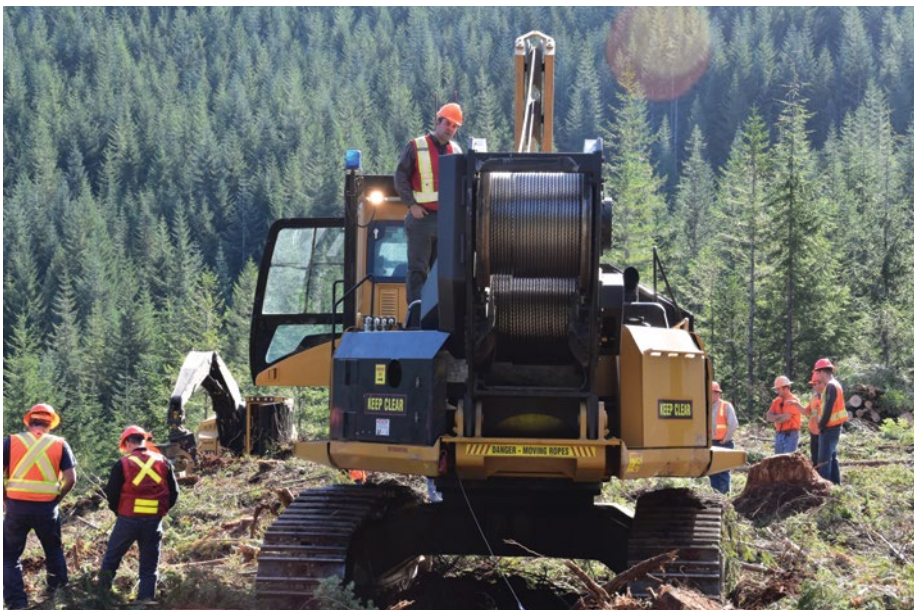

This machine, also pictured on page 55, is the first of its kind in North America. It was included in FPInnovations' tour of winch assist machines in the Pacific Northwest.

the coast, logs on a lot of steep slopes as part of their day-to-day operations.

However, "as a member of the Coast Harvest Advisory Group (CHAG), our main focus on steep slope innovations is from safety perspective," says Leitao. "If we can get hand fallers off the hill it will reduce serious incidents. Our company and the entire coastal industry is focused on this with new equipment being tested."

And, as IT learns about the new technology and equipment that is being developed globally, they are finding a sweet spot when applied to second growth harvests on steep slopes, something IT does a lot of. "We believe that when grapple yarding the small volume pieces prevalent in second-growth timber, that bunching is also needed. So beyond addressing our primary safety concern, we believe these new techniques will become mainstream on the coast since in the end, it will reduce overall second-growth harvesting costs. We currently have two contractors using tethered feller bunchers and we are now trying to determine the best way to utilize the new technology and to understand costs," notes Leitao.

The Operators Steep Slope Experience - January 13, 2:30-4:00 pm

However, steep slope harvesting may not be for everyone and the challenges of operating in this timber profile can be no better explained than by those who do it every day. For those considering the move to steep slope harvesting, these industry veterans will discuss their perspectives about the challenges and opportunity when logging steep slopes on The Operators Steep Slope Experience panel.

Reid Hedlund is the owner of Mid-

Photo: Colin Kozman, courtesy of FPInnovations

Winch assisted harvesting is a world-wide phenomenon; this machine is operating in the Swiss Alps.

Boundary Contacting in Midway BC and has made a living logging conventionally on steep slopes for most of his life. "We have been logging on steep slopes up to 55 per cent+ with conventional equipment for years," notes Hedlund, "and we have learned how to operate safely with the right equipment and trained operators. Our biggest challenge today, however, is satisfying WorkSafeBC and making sure we are in compliance with the regulations. That can be a real moving target."

Earlier in his logging career, Hedlund was steep slope logging with tracked KMC and FMC skidders and quickly learned that 400 to 500 metre skids didn't really work economically. He then went to the more conventional equipment and pushed up to 55 per cent, but as Hedlund noted, "WorkSafeBC was less focused then, so we just did it. We learned a lot and despite being safe, todays regulations have pulled in the reigns on what we know how to do safely."

John Stark owns Starks Timber Processing located in Puyallup, Washington. As a fourth generation logger in the Pacific Northwest, he has learned a lot about operating on steep slopes. He was the first operator to utilize levelers in his area, but since there was no classification for these new machines, he had to work for over a year to get local government (DNR) and safety organization (LNI) to accept the machines and their capabilities on slopes over 40 per cent.

"Our goal is to use technologies like winch assist to operate year-round while addressing soil concerns on the slopes we currently operate on, not to necessarily push the slope limits. You have to be able to work year-round to justify the investments in a new system for logging that assures a higher level of safety," notes Stark. "Our operators are experienced on slopes of 60-70 per cent, we just need the right tools to operate more safely, cost effectively and year-round." For Stark that means getting the fallers off the hill by logging with a different system, a common theme among most steep slope operators.

With three panels focused on the topic of steep slopes and panelist that have significant experience on the topic, the Wednesday January 13 TLA convention skill development day offers something for everyone working on steep slopes. For more information see: www.tla.ca/convention.