

Standing Stem Harvesting

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ABSTRACT - Standing stem harvesting is a method of individual tree selection (ITS) that allows for the safe and economic harvest of trees that would otherwise be unavailable due to environmental, social, or physical constraints. Individual trees are selected, climbed, limbed, and topped prior to being harvested directly off the stump by a helicopter.

BACKGROUND

Falling and manufacturing individual trees in standing timber is very hazardous. Falling trees in steep rocky conditions often results in the loss of value due to breakage or the loss of whole trees that slide downhill and become unrecoverable. Forest canopy and regeneration often make it difficult to locate individually felled trees from the air.

Harvesting standing stems provides a safe and economic alternative to falling individual trees. Because trees are not actually felled it provides a forest manager with the opportunity to safely access timber that would otherwise be inaccessible because of visual constraints, slope, proximity to sensitive features such as riparian zones, recreation areas, and man-made structures such as pipelines or bridges.

METHODS

- A suitable area is identified by engineers and then surveyed by timber cruisers.



- ❑ Individual trees that meet pre-defined selection criteria are marked and tallied. Species and grade selections are based on market demand. Economics determine the minimum size tree selected while the lifting capacity of the helicopter(s) determines the maximum size. The largest trees are not always selected. The process also makes the falling of small groups of trees in the immediate area viable.
- ❑ Once a tree is selected, its species and diameter at 1.3m above the ground (DBH) is recorded. Trees are marked with ribbon and numbered with paint.
- ❑ Individual tree locations, blocks, and heli-pads are mapped using the Global Positioning System (GPS).
- ❑ Prior to final selection each tree is bored to check for soundness and safety. If sound, tree climbers then climb, limb, and top the trees and record the top diameter (TD) and length (L).
- ❑ All of the data is combined in a database program to calculate log weights, volumes, and values.
- ❑ The stem is partially cut and stabilized with wooden wedges until the top of the stem can be grappled by a helicopter and pulled until the holding wood fractures. The Forest Engineering Research Institute of Canada (FERIC) has determined the optimum amount of holding wood to leave based on species, tree diameter, and Workers Compensation Board (WCB) standards. Stabilized stems must be a minimum of one and a half tree lengths apart.
- ❑ The stem is then flown to a roadside landing area or dropped directly in a booming area in the water.





ADVANTAGES

- ❑ Allows access to timber that would otherwise be unavailable.
- ❑ Allows harvesting in close proximity to sensitive or constrained areas.
- ❑ Quality control is performed at the stump in the tree selection process. This also addresses special customer requirements such as cedar poles, logs for log homes, boom sticks, totem poles, bridge stringers, or custom construction requirements.
- ❑ The GPS maps and associated data are useful for planning, permitting, and reducing financial risk. Accurate maps make post-selection ground work easier, assists in tree location, and addresses WCB concerns and standards.
- ❑ Individual tree data provides precise volumes, weights, and margins.
- ❑ There are no direct road building costs (subsidizes existing road network).
- ❑ Careful handling and harvesting without falling eliminates breakage especially in cedar poles. The harvesting method makes piling, sorting, and loading at roadside more efficient.
- ❑ Full length logs can be bucked to most profitable length and diameter.

- ❑ Close utilization of selected trees maximizes economic efficiency.
- ❑ Extends operating season (no snow load on standing stem).
- ❑ Extends the boundaries of conventional heli-logging.



DISADVANTAGES

- ❑ High cost.

Process	Cost (\$/m ³)
Engineering and Tree Selection	1.50 – 2.00
Climbing and Topping	13.00 - 20.00
Prepare (cut) Stem	3.00 - 5.00
Helicopter	30.00 - 50.00
Total	47.50 – 77.00

- ❑ Selection criteria and high harvest costs limit available opportunities.

- ❑ WCB constraints limit methodology.
- ❑ Limited lift capacity of helicopters (maximum lift 26,000 lbs. – Chinook 234).



OTHER CONSIDERATIONS AND OPPORTUNITIES

We need to differentiate between a harvesting method and a silvicultural system. The method of standing stem harvesting may be appropriate when “mining” a fixed volume of timber in a single-pass, one time entry. The method must be combined with an appropriate silvicultural system and silvicultural prescription (SP) when multiple planned entries are anticipated. This system must consider regeneration and all future forest values. A means of monitoring and measuring these values must also be determined.

Other issues surrounding this harvest method remain unclear; stumpage, residue, boundaries, labor, etc. To date standing stem harvesting has only been performed experimentally on our private land. Flexibility in planning and the opportunity to export logs to offset the high cost of development made operating on private land easier. A team is working towards using standing stem harvesting technique on crown land in 2001.