

PLANNING, ENVIRONMENTAL, MANAGEMENT AND ECONOMIC
ASPECTS OF HELICOPTER LOGGING

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INTRODUCTION

Really helicopter logging is simply a logging system where the conventional log hauling machinery is replaced by a free flying crane. Although the various facets of the harvesting operation need some modification it is the execution of activities within the time and costs constraints of helicopter logging that distinguishes the system from all others. The overriding economic objective of helicopter logging is to maximise turn efficiency. This is achieved when turn time is minimised and utilisation of helicopter lift capacity maximised.

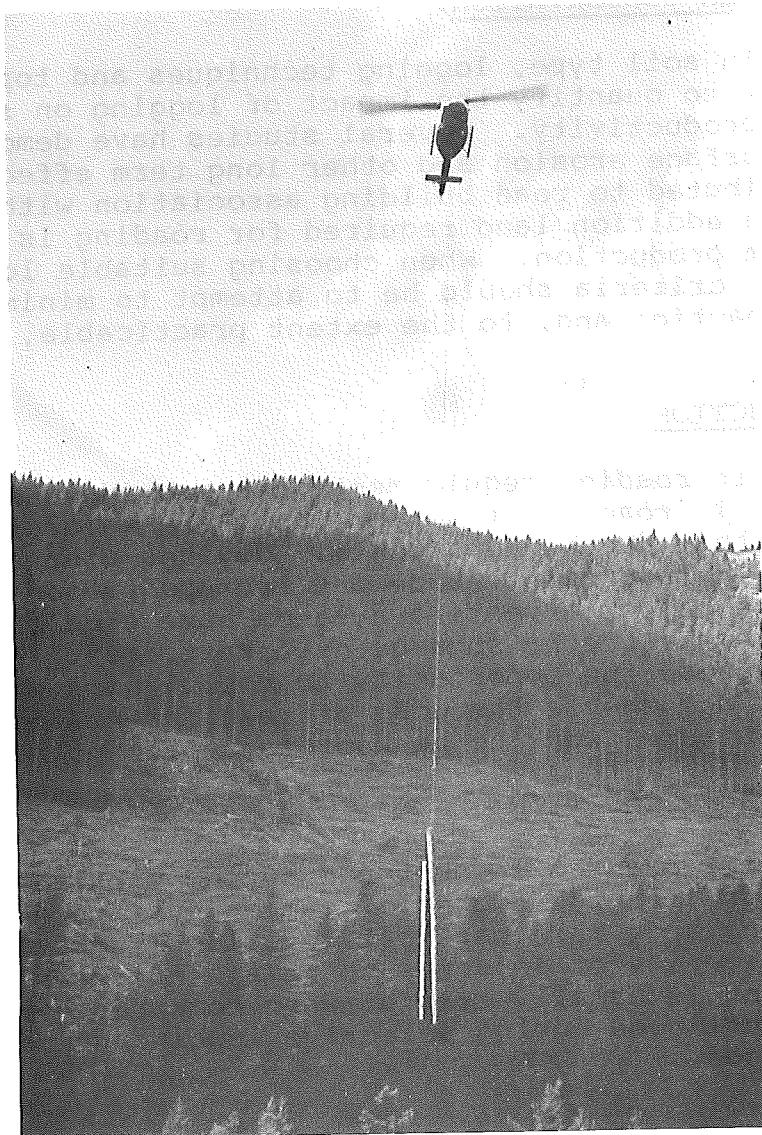


Plate 1. - Helicopter Logging, old growth douglas fir forest, using a Bell 214ST. Oregon U.S.A.

ENVIRONMENTAL, MANAGEMENT AND ECONOMIC FACTORS

Helicopter logging is not encumbered by many of the physical obstacles which impede the use of skidding or cable equipment. It is therefore able to provide an extended reach system which, in certain situations, can allow timber extraction to proceed when it might otherwise be severely hampered. It can offer major environmental and management advantages over other harvesting methods. This is particularly so on steep terrain where soil and water, aesthetic and other non-wood values are thought to be important management considerations. However, like any system, its use must be based on its capabilities and the economics of their application. The conditions which apply to a specific logging venture should be such that the advantages which emanate from the use of helicopters are significantly greater than the factors which detract from their use.

The following aspects all impinge upon the decision to select an appropriate harvesting method for any particular site. The merits and limitations of each are considered:

1. SOIL AND WATER CONSERVATION:

Variations in soil type, logging techniques and topography make it difficult to quantify the impact of logging on soil stability and forest productivity. Several studies have demonstrated that soil surface erosion and other long term effects on soil may be attributed to road building associated with timber removal. In addition land required for roading is permanently removed from production. When choosing suitable logging methods an important criteria should be to attempt to minimise erosion, surface compaction and, to the extent practicable, roading density.

2. ROAD CONSTRUCTION:

A reduction in roading requirements can provide useful savings, particularly if road construction costs are escalating at a faster rate than are hauling costs. Savings also accrue from a reduction in road maintenance and transportation charges. However, long reach harvesting systems have a major influence on the management of the subsequent forest crop. Roads, while expensive, afford the opportunity to employ more economical logging methods and enable the cost of re-forestation and subsequent silvicultural work to be kept to an acceptable level.

3. RESIDUAL FOREST CONDITION:

A long standing problem encountered during partial cutting operations has been the degree of damage sustained by crop trees during felling and, more particularly, log extraction. The extent and severity of injuries to remaining trees during helicopter logging is usually trivial when compared with much of the damage inflicted during selective logging using ground hauling methods.

Almost all helicopter logging ventures in New Zealand to date have been partial cutting operations. The delivery of the tag-line and hook through the forest canopy to the breaking-out crew is one activity peculiar to helicopter logging. This task can be a difficult, time consuming one. It is necessary to ensure that the canopy is sufficiently 'open' to enable the helicopter pilot to see the breaking-out crew and deliver the hook to them. Visibility and placement of the hook can be aided if impeding understorey growth such as tree ferns are felled before log extraction commences.



Plate 2. - Breaking-out crew. Partial cutting. Russell Forest, Northland.

4. LOGGING COSTS:

Although generalisations regarding relative costs of logging systems are extremely difficult to make because of the influence of numerous variables on cost data it can safely be said that helicopter logging is expensive. Several studies have indicated that the direct cost of producing logs in helicopter logging operations is at least two to three times that of cable logging methods. It is not difficult to conclude that, from an economic viewpoint, helicopter logging could never be considered as a substitute for ground based systems. Rather, it should be seen as a supplementary technique, most suited to areas of high value timber and steep terrain where difficult engineering or sensitive environmental conditions prevail. It may also offer some management advantages in partial cutting situations or when prompt harvesting is required as may be the case when pathological disorders or fire damage promote rapid timber degrade.

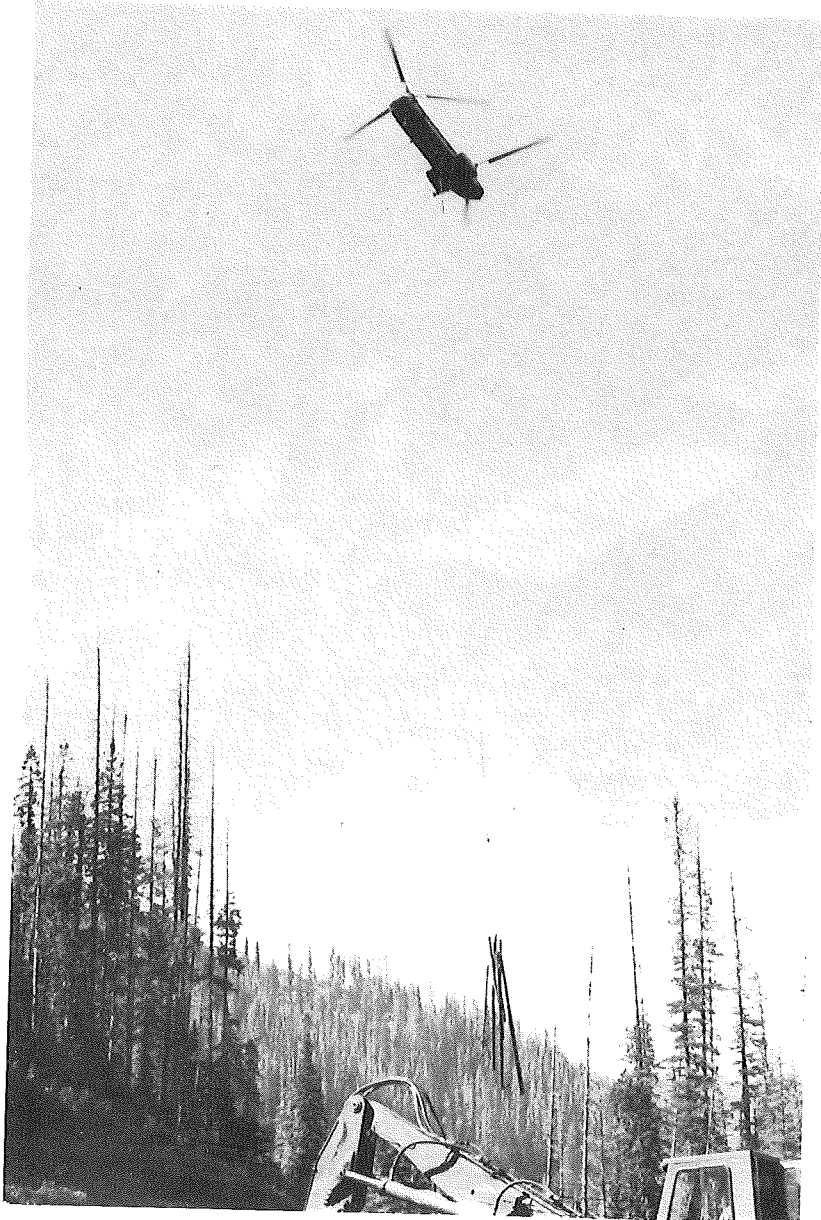


Plate 3. - Salvage logging, mixed conifer forest, (insect defoliating infestation) Washington U.S.A.

The economics of the forest industry will continue to favour skidder or cable systems. The use of helicopters for timber extraction will only be contemplated in areas where special considerations preclude the use of conventional logging methods.

Helicopter logging has, in the past, and will, no doubt, in the future be seen as providing the catalyst for technological and efficiency improvements which can then be transferred to other systems.

LOGGING PLANNING CONSIDERATIONS

Because helicopters are largely uninhibited by topographical factors aerial logging operations do not require the same intensive planning as do cable systems. However, it is a fallacy to assume that only minor planning is needed. Planning data for each cutting setting needs to include details on landing locations, horizontal hauling distances, elevation differences between log pick-up points and landings, prevailing wind direction and estimated turn times.

Planning preparation, or the lack of it, will be reflected in operation efficiency. This is particularly so with helicopter logging. Planning improvements in areas such as helicopter flight path determination, breaking-out procedures and landing design, plus technological advances such as more precise log weight estimates and tagline assembly are likely to result in increased efficiency, greater productivity, reduced costs and the wider use of helicopters for timber extraction.

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PHOTOGRAPH CREDITS

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