



AN EVALUATION OF WORKER SAFETY IN PARTIAL CUTTING OPERATIONS

INTRODUCTION

Improvements in forest management under the Forest Practices Code will undoubtedly lead to an increase in the use of partial cutting systems across the province. This shift away from conventional clearcutting will require a significant amount of forest worker retraining, and will likely raise a number of issues and concerns regarding worker safety.

Worker safety has often been cited as a major impediment to using silvicultural systems other than clearcutting. However, very little reliable information is available on the number and types of injuries to workers employed in partial cutting operations.

In an effort to evaluate potential safety risks associated with partial cutting in British Columbia, the Forest Service, in cooperation with the Workers' Compensation Board (WCB), initiated a research project to:

- identify forest worker safety concerns;
- describe potential hazards; and
- develop recommendations to minimize hazards.

G. A. Bell & Associates Ltd. of Langley, B.C. conducted the research. The following is a summary of their March 1995 report.

METHODS

Several methods were used to assess the safety risks associated with partial cutting in British Columbia:

- statistical reviews of data from B.C., the rest of Canada, and other countries;
- field interviews with forest companies, logging contractors, and WCB officers; and
- telephone consultations with various representatives of the forest industry.



Partial cut.



Field interviews conducted with fallers.

RESULTS

Statistical Reviews

1. Comparison of B.C. accident statistics for partial cutting and clearcutting

Thirty-four B.C. companies involved in partial cutting were selected from three geographical regions in the province – the coast, southern interior and northern interior. With the companies' consent, their WCB injury data were assessed and compared with other forest companies in British Columbia involved primarily with clearcutting.

Similar injury rates were found for the 34 forest companies involved in partial cutting versus other forest companies. However, the reliability of the data is limited since it is unknown how many of the other companies may have also been involved in limited amounts of partial cutting. Furthermore, given the small size of the database, no statistically significant conclusions can be drawn from the analysis.

2. Review of Canadian statistics for partial cutting operations

Canadian statistics on injuries and hazards associated with partial cutting were investigated through compensation boards and other agencies in Quebec, Ontario, New Brunswick and Alberta.

The various agencies contacted did not keep separate statistics for partial cutting, and therefore no usable data were found.

3. Review of international statistics for partial cutting operations

Safety organizations in Sweden, Finland, Switzerland, Germany, New Zealand and the United States (Pacific Northwest) were contacted to obtain statistics on accidents, hazards, hazard reduction interventions and types of forest practices used.

Once again, the requested data were unavailable because the countries contacted did not keep separate records for partial cutting operations.

Field Interviews and Telephone Consultations

Field interviews were conducted through an interview/questionnaire process with forest companies and logging contractors currently or previously involved in partial cutting. The questionnaire was designed to identify sources of hazards and accidents in partial cutting operations and compare them with clearcutting.

Local WCB officers were also contacted for their feedback on partial cutting worker safety issues. Information on the different work positions and the modifications to job duties and equipment required for partial cutting was also collected.



Machine operators were also interviewed.



In addition, representatives from various areas of forest industry, including forest company organizations, unions, company foresters and WCB officers, were contacted by telephone for their impressions of worker safety in partial cutting operations and their opinions on issues needing to be addressed to ensure worker safety.

Fifty-nine field interviews were conducted between December 1, 1994 and January 15, 1995. The average length of experience was 17 years for all types of logging and six years for partial cutting. Respondents had been logging for an average of nine years at the locations where the interviews were conducted.

Sixty-nine percent of questionnaire respondents felt that partial cutting and clearcutting were not equally safe, and 82% felt that partial cutting was more hazardous. The number one reason given for this was the “risk of working around/among standing timber.”

Only 10% of questionnaire respondents had been injured seriously enough to take more than one day off in the last five years while employed in partial cutting operations.

Participants were also asked to identify work positions at their locations and whether or not any of these positions were “new” as a result of partial cutting. The most significant observations obtained from interview questionnaires, telephone consultations and discussions with industry personnel were:

- the switch to partial cutting created work positions with multiple duties;



Partial cutting has resulted in an increase in horse logging.



Partial cutting operations could be made safer by providing proper training/education in the field.

- a more mechanized approach to partial cutting operations was preferred;
- partial cutting has resulted in an increase in horse logging; and
- additional pre-planning is required for partial cutting, which is more labour intensive at the layout stage.

The most hazardous work position in partial cutting operations was identified as hand falling, with “struck by” limbs, snags and tops as the greatest hazard and source of injury. Training, awareness and planning were solutions commonly mentioned.

Almost 51% of participants responded that they had not made any changes to the way they performed their jobs in partial cutting operations. Of the 49% who had made changes, 24% felt the changes made their jobs more hazardous, 41% said less hazardous, and the remaining 35% felt there was no change in the hazard level.

All respondents felt they possessed the skills and knowledge necessary to safely perform their present jobs, but only half of those stated that specific work procedures had been developed for their work positions.



The top four interview questionnaire responses to how partial cutting operations could be made safer were:

- provide proper training/education in safe work practices;
- be alert and aware of hazards;
- mechanize – reduce hand falling; and
- work as a team – communicate, cooperate, coordinate.

The economics of partial cutting and safety was a topic that consistently surfaced during contact with the forest industry groups. Respondents indicated that economics and safety were related by the fact that partial cutting had higher costs per unit of wood harvested. “Shortcuts” to meet production requirements circumvent safety standards and regulations.

An examination of the statistical review and field research reveals four consistent and significant findings:

- “struck by” is the number one hazard and cause of accidents in partial cutting and clearcutting operations;
- fallers have the greatest risk of injury in both partial cutting and clearcutting;
- there is a consistent perception by loggers and industry personnel that the risk of injury is higher for partial cutting; and
- the relative risk of injury between partial cutting and clearcutting cannot be statistically determined based on currently available accident statistics.

The workers with the greatest risk of injury in partial cutting operations are those physically exposed to hazards of working around and among standing timber: fallers, chokermen, yarding crews and helicopter ground crews.

Hazards that are unique to the operational requirements of partial cutting include:

- snags and unstable trees that cannot be felled prior to work in the area;
- hung-up broken limbs or tops that can be knocked loose;
- knocking down trees or limbs and tops, when falling through standing timber;

- exposure of horse logging teamsters to the above-mentioned hazards and to the unpredictable nature of working with horses; and
- the unique flight characteristics and operational requirements of helicopter logging when raising logs through standing timber.

THE REPORT'S CONCLUSIONS AND RECOMMENDATIONS

Conclusion 1

Safety statistics for assessing hazards and injuries in partial cutting operations are currently unavailable because partial cutting records are not separately classified in existing databases in British Columbia, the rest of Canada, or, for the most part, internationally.

Recommendation

Develop methods to identify and classify partial cutting operations in WCB and other database agencies.



Mechanized partial cutting operations may result in fewer injuries.



Conclusion 2

From a limited database of WCB injury statistics in B.C., similar injury rates were found between partial cutting operations and other logging operations using primarily clearcutting. However, the sample size was too limited to be considered statistically significant.

Recommendation

The specific job hazards associated with partial cutting need to be further investigated once a significantly larger database has been established.

Conclusion 3

Information from Washington State indicates that totally mechanized partial cutting operations may result in fewer injuries.

Recommendation

Obtain additional information on mechanized partial cutting from Washington State.

Conclusion 4

Risks associated with falling and skidding in standing timber can be reduced by making forest workers more aware of the hazards.

Recommendations

- Develop safety training programs on safe work procedures and hazard awareness for forest workers employed in partial cutting operations.



Good planning and site layout can help reduce hazards in partial cutting.

- Encourage employers and unions to help maintain worker motivation and safety awareness.
- Ensure that existing knowledge regarding partial cutting operations is shared throughout B.C., particularly from the southeast corner of the province where partial cutting has been common for many years.

Conclusion 5

Hazards in partial cutting can be reduced by:

- good planning and site layout;
- flexible leave tree options; and
- reducing economic pressures on forest workers and companies when there are safety concerns.

Recommendation

Provide additional training on operational safety procedures for foresters responsible for establishing partial cutting requirements and cutblock design.

Conclusion 6

The need for additional forest worker training with partial cutting operations is driven by:

- the unique requirements of harvesting among standing timber;
- work positions with multiple duties; and
- an often higher level of mechanization compared to clearcutting.

Recommendation

Develop safety regulations, standards and procedures that specifically address partial cutting operations (e.g., WCB safety and health regulations, procedure manuals).



INITIATIVES IN RESPONSE TO THE REPORT

The following initiatives are based on the recommendations of the Bell and Associates' report:

1. The Forest Service will work with the WCB to investigate the possibility of modifying the way accident statistics are collected to better reflect the number and kinds of accidents caused by different silvicultural systems. The availability of such data would allow for an accurate statistical analysis of partial cutting hazards and accidents once a large enough data base is established.
2. The Silviculture Practices Branch, in cooperation with the Forest Service regional staff, the WCB and licensees, have already begun developing a series of safety publications to help in the design, layout and implementation of partial cutting silviculture prescriptions aimed at:
 - foresters and planners involved in the forest development plan/silviculture prescription stage;
 - foresters, supervisors and loggers involved in the development of logging and falling plans; and
 - loggers involved in falling, yarding and landing work.

The publications will incorporate partial cutting work experience and knowledge from across the province.



Safety material will be developed for foresters, planners, supervisors and loggers.

3. The new safety material developed will be used in all existing and any new courses on partial cutting or biodiversity.
4. The Forest Service will assist the WCB in developing proposed amendments to WCB regulations to accommodate the shift towards more partial cutting in the province.

Silvicultural Systems Program

NOTES TO THE FIELD

For more information on worker safety and partial cutting, or for a copy of Bell & Associates' report, please contact:

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