Timber supply and aesthetics at the landscape level: A fresh look at an old problem

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INTRODUCTION

Alternative timber harvesting practices can potentially meet visual quality objectives in the more visible "front country," while relieving pressure on dwindling back country forest ecosystems. These methods may provide timber volumes that are substantially higher than is possible with clearcutting under typical visual resource management constraints.

MATERIALS AND METHOD

We reviewed selected case studies of the relationship between timber supply and aesthetics in North America, and summarized relevant aspects of the management of visual resources in British Columbia. We examined hypothetical relationships between timber supply and the intensity of visual resource management at the landscape level. These relationships were derived from available Ministry of Forest data (B.C. Ministry of Forests 1998B), which quantified what could be harvested under standard Visual Quality Objectives (VQOs) for both partial-cut and clearcut harvesting. A simple model was used to determine the available timber supply for any given combination of VQOs in a landscape unit (expressed as a "VQO intensity" index of 0–1, based on the proportion of land covered by more or less restrictive VQOs). As a preliminary example, these hypothetical relationships were examined in the context of the Arrow Forest District in the West Kootenays.

RESULTS AND DISCUSSION

Various studies suggest that, in forested landscapes, aesthetic public preferences decrease as the amount of visible landscape alteration increases (e.g., Berris and Bekker 1989). Accordingly, traditional visual resource management approaches using VQOs have assumed that increased visual sensitivity constrains timber supply (B.C. Ministry of Forests 1998B). Indeed, some researchers (e.g., Fight and Randall 1980) have found that VQOs lead to increased harvesting costs and lower timber availability. However, the true effects of visual resource management on timber supply will depend on:

- the extent of overlapping constraints from other non-timber resource values and policies;
- the method of determining acceptable harvesting levels to meet a given VQO; and
- the forest practices used.

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Various partial-cutting practices have proven successful in meeting VQOs in visually sensitive areas (Fight and Randall 1980), and have even increased both timber supply and aesthetic quality (McDonald and Litton 1998).

Established VQOs, as currently implemented under Forest Practices Code and Timber Supply Review procedures, essentially constitute a kind of zoning in which less timber harvesting is allowed in areas with more sensitive views. Recently, this system has been changed whereby, unless otherwise stated in a Higher-level Plan, the District Manager is provided with full discretion in managing (or not managing) visual resources (B.C. Ministry of Forests 1998B); this includes the authority to relax existing VQOs where they conflict with timber needs. Figure 1 summarizes how visual resources are managed in British Columbia.

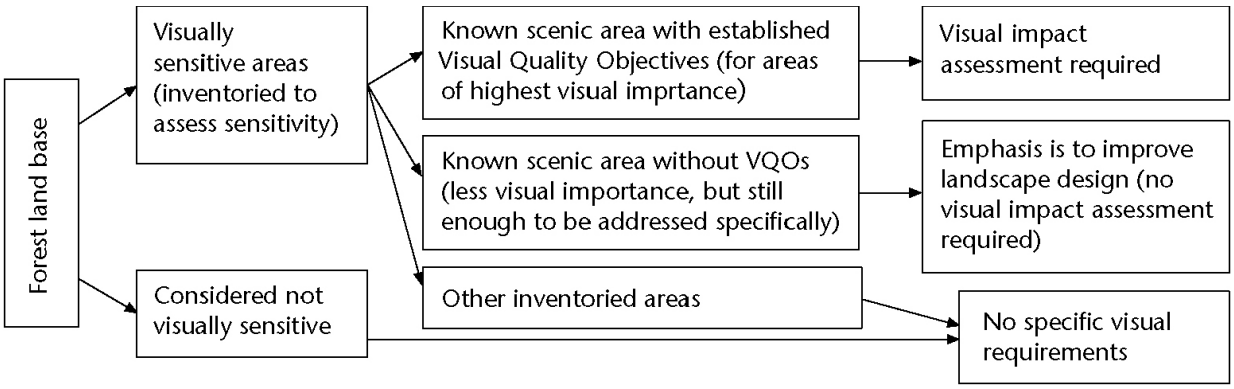

FIGURE 1 *Visual resources management scenarios in British Columbia (adapted from B.C. Ministry of Forests 1998A).*

The prescriptive approach to VQOs, as an automatic constraint on timber supply, can ignore substantial opportunities to meet objectives with increased timber harvesting through partial cutting and better design. While Ministry of Forests guidance recognizes the benefits of landscape design in a more flexible approach to harvest planning, in areas with established VQOs the typical process may lead either to timber being "locked up" unnecessarily in the "front country" at the expense of the backcountry or mill closures, or to a wholesale relaxation of visual controls which may lead to a public backlash.

These problems and potential solutions can be illuminated through an examination of recent Ministry studies and policy guidance. Public perception studies (B.C. Ministry of Forests 1997) were conducted in which the public ranked different levels of landscape alteration or denudation from timber harvesting (clearcuts and partial cuts) on their visual quality. These results were used in Timber Supply Reviews to factor in the effects of visual resource management. This was done by establishing norms for basal area (for partial cuts) and "percent denudation" (for clearcuts) allowed for harvest while meeting given VQOs (see B.C. Ministry of Forests 1998B).

The relationships derived from these norms (Figure 2) indicate that where VQOs have been established, timber supply could potentially be significantly increased using certain kinds of partial cutting. In all cases, partial cutting appears to offer either equivalent or increased timber supplies for any given combination of VQOs in a landscape unit. Results also indicate that much higher visual quality could be achieved through partial cutting for a given level of timber supply. In essence, the perception studies found that people detect and react adversely to much smaller harvested volumes if these are clearcut rather than partially cut, although further testing at the higher volume partial cuts is warranted.

How would these hypothetical relationships affect, for example, the case of the Arrow Forest District, where much of the remaining merchantable timber (18.8% of the land base available for harvest) occurs

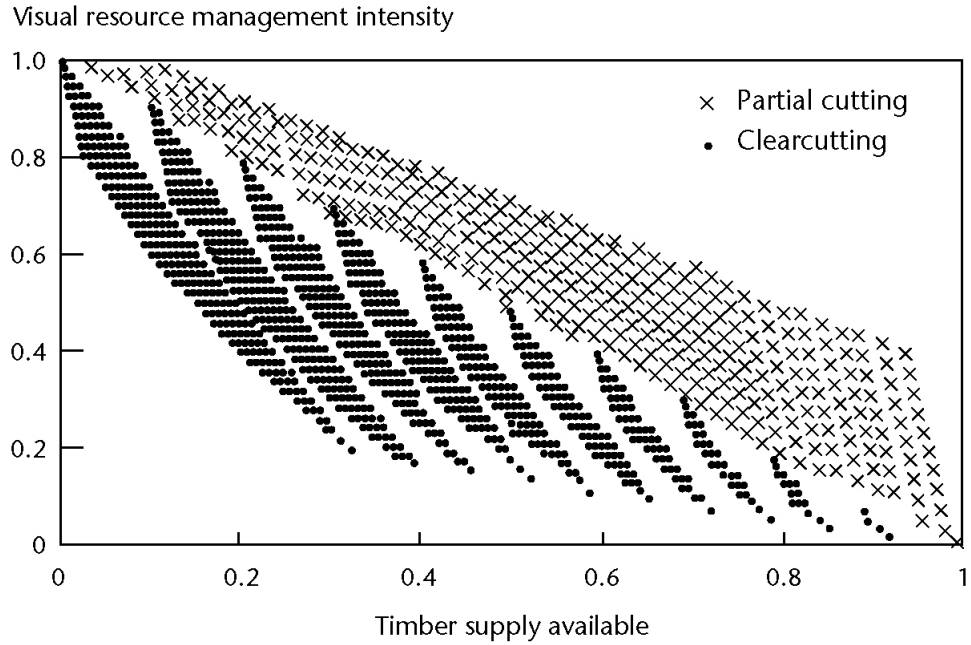

FIGURE 2 *Theoretical relationships (index values) between the management of visual resources and available timber supply under both clearcutting and partial cutting.*

in the front country under restrictive VQOs (B.C. Ministry of Forests 1994)? Within these areas, the effects of VQOs on timber supply could theoretically be reduced by as much as 10.3% (from a 17% constraint on timber supply down to 6.25%) by using partial cutting, without sacrificing visual quality. However, these figures must be viewed with great caution because:

- other forest cover constraints may reduce this effect (e.g., community watershed constraints, which also contribute to meeting VQOs); and
- procedural, operational, and financial issues may limit the feasibility of partial cutting.

In conclusion, the application of the "percent alteration/denudation" measure used under a clearcut system may be unnecessarily restrictive in some cases; VQOs should be used as an effective performance standard, not a blanket timber supply constraint. Alternative forest practices, such as partial cutting systems (where feasible) and innovative landscape design, may represent a "win–win" situation for visual quality and timber supply, with potential benefits to community acceptance and backcountry ecosystems. However, forest health and windthrow risks, increased costs, lack of training, and longer layout/approval processes may limit feasibility. Thorough studies of these more complex relationships must be conducted.

REFERENCES

Berris, Catherine and Pieter Bekker. 1989. Logging in Kootenay landscapes: the public response. B.C. Ministry of Forests, Victoria, B.C. Land Management Report No. 57.

B.C. Ministry of Forests. 1994. Arrow Timber Supply Analysis Report. Timber Supply Branch, Victoria, B.C.

_____. 1997. Visual impacts of partial cutting: summary report. Technical analysis and public perception study. Forest Development Section, Forest Practices Branch, Victoria, B.C.

_____. 1998A. Framework for managing visual resources to mitigate impacts on timber supply. Forest Development Section, Forest Practices Branch, Victoria, B.C.

_____. 1998B. Procedures for factoring visual resources into timber supply analyses. Forest Development Section, Forest Practices Branch, Victoria, B.C.

Fight, D. Roger and M. Robert Randall. 1980. Visual quality and the cost of growing timber. Journal of Forestry 78(9):546–8.

McDonald, P.M. and R.B. Litton. 1998. Combining silviculture and landscape architecture to enhance roadside view. U.S. Department of Agriculture, Forest Service, Berkeley, Calif. Research Paper No. 235.

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