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Incorporating newsletters of:
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in this issue:

Ecosystem silviculture

Soil degradation guidelines for mechanical site preparation

Alberta silviculture tour

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A FEW GOOD PHOTOS

We are looking for exciting silviculture photos to grace the cover and articles of *Canadian Silviculture Magazine*. We will pay a small honorarium to individuals whose photos we use. Send them to : #4–1825 Nelson St., Van., BC, V6G 1M9.

We want to apologise for not crediting Larry Deol for the spectacular photo on the cover of the premier issue.

COVER SAFETY IN ISSUE #2

What was wrong in the cover photo on Issue #2 of *CSM*, depicting commercial thinning of red pine in Nova Scotia? Is the worker holding his saw with the wrong hand on the throttle? Is it a left-handed saw? Not quite. Hold the cover up to a mirror and our friend will look a lot safer (but now the words are backwards). Thanks to Hugh Purley at the Safety and Training Committee of Nova Scotia Forest Products Association for pointing this out.

And thanks to Nova Scotia's Ministry of Natural Resources for supplying the photo.

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WINTER 1994

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Tough enforcement for forest practices rules

BC MOF has released a draft Forest Practices Code, a commendable and epic set of rules for sustainable forest management. It is a compilation of all rules governing forest operations, synthesizing "hundreds of acts, regulations, policies and guidelines" from a dozen Ministries (rumored to be a stack five feet tall). To herald its intent of "tough enforcement," MOF shut down two logging operations in December for a type of operational 'mistake' that previously received a "Notice to Comply." Operations were suspended until stream damage was repaired.

The rules are wide reaching. Some samples from Section 11: Regenerating the Forest:

11.9.2 use of tree breeding plans and... pedigreed stock must... not decrease levels of genetic diversity across the landscape.

11.12.3 Where domestic sheep are used for brush control, measures must be designed and carried out to:

- protect fish, wildlife, & their habitat;
- minimize predator conflicts;
- protect irrigation and domestic water supplies;
- prevent disease transmission to wildlife...

11.13.9 Pruning must be carried out as a basic silviculture practice where low stand densities have been prescribed as a condition of harvesting to achieve approved wildlife habitat management objectives in addition to high value timber production objectives...

Now you AAC it, now you don't

For the past two years, BC's MOF has been engaged in a four year overhaul of its forest inventory records and methodology for calculating annual allowable cut (AAC). 1994 and 1995 will see adjustment of AACs for many timber supply areas (TSAs) to reflect current inventories. This process is predicted to reduce BC's overall AAC by 20% (from 75 million to 60 million $m.^3$).

The CORE land-use process will also withdraw areas currently designated for harvesting. This is predicted to further reduce the cut by 10-20% in areas such as Cariboo, Kootenays and Vancouver Island. BC's proposed Forest Practices Rules, scheduled for 1995, include new mitigation measures for the cumulative effects of harvesting, restrictions on clear cutting patterns, protection of biological diversity, watershed restrictions and new tougher environmentally sensitive road building standards. These new rules, combined with tougher enforcement, are estimated by some people to reduce the AAC by another 15-30%.

For most companies, the tremendous uncertainty of future wood supply has created a frenzied atmosphere of make hay while the sun shines. Harvest pressure from high prices for open market wood has accelerated the harvest on private land. Mills in BC are hauling wood from Alberta ranchers and reserves, in some cases from as far away as Saskatchewan. In this atmosphere, the WSCA has called for the application of BC's silviculture regulations to private land.

AAC reduction could mean loss of 100,000 jobs

This province has over 350 thousand people directly and indirectly employed in the forest sector. The AAC reduction effects from the new inventory (20%), CORE (10–20%) and forest practice rules (15–30%) may overlap in some areas. But an average cumulative reduction of 35-50% would mean the loss of 100 to 175 thousand jobs. This comes as no surprise to regular readers of *CSM/WSCA Newsletter*, because we have been predicting this scenario for ten years. The difficulty has been convincing government to prevent it by regulating and funding an intensive silviculture strategy to optimize the sustainable volume and value of intermediate age stands.

MOF's Lumby log market

Some of BC's harvest can clearly afford to carry 'rent' or stumpage costs of more than just basic silviculture. Since mid-August MOF has been auctioning off logs from it's sorting yard east of Lumby for an average price of $85 per cubic meter. These logs come from selection, sky-line and horse logging experimental harvests where costs are approximately $40 per cubic meter. With today's shortage of wood and high lumber prices, and through this kind of a small auction, alternative harvest options are certainly affordable. The net of $45 per cubic meter is far more than the current cost of $3-8 per cubic meter for basic silviculture— enough to fund a considerable intensive silviculture program to redress wood supply shortages.

Countervailing duty removed: $600 million available– for what?

The US commerce department has decided to drop the softwood lumber tariff, in accordance with the December 17 decision of the Bi-national Free Trade Panel. This panel was composed of three Canadians (against) and two Americans (for) the countervailing duty. This split along national lines for an interpretation of US law, may be the basis for an appeal still available to the US Coalition for Fair Lumber Imports.

Meanwhile BC premier Mike Harcourt is eyeing BC's portion of the $600 million collected by the interim 6.51% US tariff since March, 1992. He has suggested that forest companies spend their refunds on reforestation. The NDP government in Ontario, currently in negotiation with the forest industry over the transfer of reforestation responsibilities, is also sure to be eyeing the portion from Ontario industry shipments.

Beware! Lyme disease in BC

Lyme Decease has reached epidemic levels in north east and north-central US and has now been diagnosed in BC in 23 people. "This could be the tip of an iceberg." says UBC Microbiologist Satyendra Banerjee. It is a bacterial infection that is spread by tick bites. One percent of ticks have been found to carry the decease. Some early symptoms include fever, headache, fatigue, stiff neck and a rash which looks like a bulls eye with an expanding red circle. It is treatable with antibiotics, but only if detected, hence this warning. Untreated it can lead to visual disturbances, facial paralysis, arthritis, irregular heartbeats and seizures and it may become chronic.

ECOSYSTEM SILVICULTURE:

Ecological principles, implications for communities

Dr. David A. Perry, Department of Forest Science, Oregon State University

Note: This is an edited version of a paper at the Second National Silviculture Conference. References available from the author.

Growing concern about the impacts of intensive forest management on biological diversity, aesthetics, and long-term productivity has led foresters throughout the world to reevaluate practices aimed solely at maximizing the production of wood fibre, and to begin developing strategies for managing ecosystems instead of just trees. In this article, I review basic principles of ecosystem management, and offer some brief thoughts on socioeconomic implications of a more ecologically-based silviculture.

I. The diverse managed forest: *general principles*

Two principles apply to any forest type:

1. Spatial scale and context are important

Unlike organisms, ecosystems do not have a skin that clearly separates one from another. Ecosystems are defined by interactions that extend across broad, ill-defined spatial and temporal scales. The implication for ecosystem silviculture is that individual stands should not be managed in isolation from the landscapes in which they are embedded, nor should individual watersheds be managed in isolation from their region.

2. Appropriate complexity is important.

A primary goal of ecosystem management is to protect structural and functional complexity, such as the abundance and distribution of habitats, keystone organisms and structures, cycling and storage of elements, and biological legacies. This shifts the primary focus from what is taken during harvest to what is left. It is important to recognize that complexity is, itself, complex, and may manifest quite differently depending on forest type. Hence, specific management approaches that are appropriate for one forest type may not be appropriate for others: nature provides the template.

Spatial scale and context: landscapes and regions

Landscape patterns determine the variety, integrity and interconnectedness of habitats within a region. Moreover, the amount and distribution of community types across the landscape strongly influence the rate at which virtually all types of forest disturbances propagate, and the intensities that they attain. Insects, pathogens, fire, wind— forces that are relatively innocuous, even beneficial, when at certain levels— can become highly destructive in a landscape that magnifies, rather than buffers and absorbs, their destructive energy. The primary objectives of landscape silviculture correspond to the functional roles of pattern in the natural landscape: that is, to create or maintain a proper mix of habitats, to create or maintain pathways of movement among similar habitats, and to buffer and absorb the energy of destructive forces. These objectives are not automatically consistent with one another: careful planning, with an eye to all, is necessary.

Habitats

The habitat template within a forested region comprises: (a) different major forest types, (b) different successional stages within a given forest type, and (c) unique communities such as riparian zones. Species that typify different habitats— particularly seral stages— often differ in life history characteristics in ways that are significant for conservation strategies. Compared to early successional communities, a higher proportion of late successional species have one or more characteristics that make them vulnerable to extinction. This is particularly true for those vertebrates, often at the top of the food chain, that require large amounts of territory and/or safe havens from hunters and poachers. Much of the old-forest habitat remaining in the United States is fragmented into small islands and permeated by roads and powerlines, which diminish the quality of interior habitat in various ways. Clearly a fragment that contains less than the minimum-area requirements of a family group of a given species is unsuitable for that species. But even those interior forest species that find enough space within a forest that is fragmented and/or permeated with roads may become more vulnerable to predators and parasites.

Forest protection

From the landscape perspective, the strategy for protecting forests is to create (or maintain) landscapes that buffer and absorb disturbances, rather than magnify them. Homogeneity will almost certainly magnify disturbances of one kind or another, and whether a particular heterogeneous pattern is absorbing or magnifying depends on the types of disturbances likely to move through it. Once again, each case must be analyzed on its own merit. Roads facilitate the entry and spread of any number of potentially disruptive agents. In the US Pacific Northwest, logging roads have facilitated the spread of at least five pest species. The scales at which heterogeneity occurs will be an important consideration. For instance, old-growth forests of the Pacific Northwest are (relatively) homogeneous on the scale of 10's of km, but quite heterogeneous on the scale of 10's to 100's of m. The large-scale homogeneity provides good habitat for interior forest species, while the fine- and medium-scale heterogeneity diversifies the forest and helps retard

the spread of fire. Densely stocked young stands are homogeneous at the smaller scales, which facilitates fire spread through crowns. A landscape filled with such stands not only provides poor habitat and is deadly boring, it is also a firetrap.

Stand-level: Biological Legacies

It is clear that, while succession undeniably has a stochastic component, communities are not thrown about willy-nilly by natural disturbances, but tend to maintain certain trajectories. This may be accomplished in various ways, but one recurrent, general theme is the importance of biological legacies—those components of biodiversity that are passed from old to new and provide continuity through time. The concept of biological legacy is very broad, but can be briefly summarized as anything biological or of biological origin that persists, and through its persistence helps maintain ecosystems and landscapes on a given trajectory. Legacies may be tangible objects (e.g., large dead wood), or they may be elements of pattern or system structure. They may function to maintain processes, habitats, or linkages— in the real world these three elements are inseparable and work together to maintain properly functioning ecosystems. Some examples of legacies are:

(a) Redundancies that stabilize critical processes such as the nutrient cycle, or that maintain critical links, such as those between plants and their mutualists (mycorrhizal fungi, pollinators).

(b) Keystones that provide some unique habitat or service, such as large dead wood and nitrogen-fixing plants.

(c) Reservoirs, such as soil organic matter, large soil aggregates, and seed banks.

(d) Stand-level structural patterns, such as multiple canopy layers.

(e) Landscape patterns. Landscapes are the templates of survival for populations and metapopulations, and hence represent the intersection between spatial patterns and temporal continuity. No one piece of ground will always provide suitable habitat for any given species, but so long as a legacy of sufficient suitable habitat occurs within a region, the species will persist and provide a continuing source of colonists. Maintenance of a diverse gene pool — provided by sufficient gene flow among subpopulations— is another legacy that depends on the distribution of habitats within regions.

Now let's review some specific pieces and patterns that should be protected within stands if management objectives include maintaining biological diversity and sustaining long-term productivity.

Large dead wood

Snags and logs are habitat for many animals, including birds and insects that contribute to forest health by consuming defoliators and barkbeetles. In the Blue Mountains of Oregon and Washington, for example, 39 bird and 23 mammal species use snags for nesting or shelter. A mature, unmanaged Douglas-fir forest in the Cascade Mountains supports about an

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estimated 90 terrestrial vertebrate species (excluding bats); eliminating snags reduces the number to about 80, and eliminating both snags and logs reduces it to about 60. Old, decayed logs are rich sources of carbon for microbes and invertebrates, and in addition are efficient water reservoirs, sites of nitrogen fixation, and, particularly during drought, may be centres of biological activity for organisms that cycle nutrients; moreover, logs create essential habitat for fish and invertebrates in streams and estuaries of the Pacific Northwest, and to a certain extent, even in the open ocean.

Diverse plant species

The majority of both applied and basic research on interactions among plant species has focused on competition. In result, we know far less than we should about positive interactions, which are likely to be subtle, indirect, play out over long time periods, or perhaps manifest themselves only at certain times during stand history (e.g., soil stabilization following disturbance). While plant species undoubtedly compete for resources, accumulating evidence shows that they may also benefit, either directly or indirectly, from one another's presence. One of the better known examples is symbiotic nitrogen-fixation, which is by far the major source of nitrogen for many forests. Other positive effects of noncommercial plant species on nutrient cycling are less well understood, but seem likely to be significant. Sprouting hardwoods have the capacity to rapidly recover following a stand-destroying disturbance, stabilizing nutrients and probably beneficial soil biota. Some species (e.g., maples and cedars) cycle Ca, an element that has long been associated with productive forest soils.

Retaining hardwoods within conifer forests provides important habitat. Birds in piedmont forests increase sharply as hardwoods establish beneath pines during later successional stages; although at least one— the endangered red-cockaded woodpecker— prefers old growth forests with open understories. Retaining hardwoods within southern pine stands will be necessary to maintain populations of cavity-dependent species.

Scattered studies and field observations suggest that, in at least some cases, hardwoods play a protective role in conifer stands. The severity of fusiform rust increased after weeding in loblolly pine plantations, and, in Quebec, conifer plantations have fewer insect problems when admixed with nonconifers than when not. No cause and effect has been established (or claimed) in either case, but observations such as these generate hypotheses that should be tested. The idea of plant-defense guilds, or "associational plant defenses", is not new -- organic gardeners routinely grow marigolds amidst other crops to provide protection against pests. Another question— of considerable relevance to a hotter, drier future— is whether the relative inflammability of some hardwoods might protect conifer stands from fire. A number of foresters from northern California and southwest Oregon have reported that certain hardwood species intermixed with conifers protect the latter from fire. Research done 20 years ago showed that the chemical composition of the leaves of some plant species retards fire; a dangling scientific thread that needs to be picked up and followed (one of many in ecology). It is interesting to note that, following the Yacalt burn in southwest Washington early in this century, strips of alder were planted along with Douglas-fir as fire breaks. Did those old foresters know something that we have forgotten?

...while plant species compete for resources, accumulating evidence shows they may also benefit from one another's presence...

II. Silvicultural Approaches

To recapitulate, in order to restore and maintain biological diversity, managers must: (a) restore a proper balance of habitats, where "balance" includes relative proportion, quality, and spatial arrangement; (b) maintain that balance by long-range planning, and by protecting the processes that keep systems healthy. How these objectives translate into specific management actions will vary, depending on the ecology of a given region. Nature provides a blueprint, but one that must be used carefully. For example, the pattern of legacies left by natural disturbances provides a good guide for stand-level silviculture, but basing landscape-level harvest patterns on historic natural disturbance patterns is inappropriate if done at the wrong scale. To illustrate why that is so, consider the situation in the Pacific Northwest. The fact that some past wildfires were quite large does not justify large cuts in watersheds not yet logged, because they are embedded in a regional landscape that has been highly altered by logging and bears no resemblance to historic patterns. Restoring an entire regional landscape toward historic patterns is another matter, because it mimics nature at the appropriate scale.

Various approaches may be used to create managed landscapes without destroying the basic fabric of the natural forest. "Gap-driven" forest types, such as temperate deciduous, and some conifers, are uneven aged at a fairly fine scale (10's of m's) and include a significant proportion of tree species that tolerate at least moderate levels of shade. Harvesting trees in small groups or narrow strips maintains the natural structure of these forests, and in addition protects soils from heat, erosion, and excessive nutrient leaching. Single tree gaps are interspersed with multi-tree gaps at least 500 m2 in area. The larger gaps allow regeneration of moderately shade-intolerant tree

species and create a diverse structural mosaic. Management by single-tree selection only would almost certainly lower the diversity of these forests.

Some old-growth conifer forests (e.g., ponderosa pine, Douglas-fir) may also be characterized by a patchy, multi-aged structure, though the scale at which patchiness occurs, and the size of opening needed to successfully establish regeneration differs from forests comprised of more shade tolerant species. A multi-age structure is probably feasible under management using group-selection, or periodic thinnings that remove enough of the overstory trees to allow establishment of a younger age-class. In forests that grow naturally with relatively open canopies, even shade intolerant species may be successfully regenerated using single-tree selection: it is not how many trees you take out, it is how much light gets to the forest floor. Another important factor for natural regeneration is the suitability of the seedbed. In conifer forests that tend to develop heavy litter layers, successful regeneration within a multi-aged management system will probably require controlled underburning or some other technique to expose mineral soil seedbeds.

Density control is an important tool for diversifying many forest types. Growing stands at wide spacing allows noncommercial plant species to coexist, and produces large trees more quickly. Thinning, coupled with rotation length, can be used to manage the proportion of different seral stage habitats within a landscape: for example, forests can be moved from an early successional structure to an old growth one without ever passing through a closed canopy stage (if that is desirable). On the other hand, entering stands too frequently risks tree damage and soil compaction. Aerial lift or animals should be used whenever feasible; when not feasible, designated skid trails are a must in order to avoid compaction, and residual trees must be protected.

Growing at least a portion of stands on long rotation will be essential to produce sufficient old-growth habitat within the managed landscape, and to avoid creating too much early successional habitat for animals such as deer that can become serious pests when too abundant. Should forests be cut shortly after attaining the desired late successional structure, landscape level goals will not be achieved. This point is illustrated by the formula: $R = L/(1-p)$

Where: R = rotation length; L = length of time required to return to an old-growth structure following a regeneration cut; and p = target for proportion of landscape in forest with old growth structure

If the target is 60 percent of the landscape in forests with old growth structure, and 100 years is required to achieve that following a regeneration cut, rotations must be 250 years. If only 50 years is required to return to an old growth structure, rotations of 125 years will allow the landscape target to be met.

Leaving a cover of large trees following regeneration harvests ("green-tree retention"), allows two or more canopy layers

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to be developed, and provides a future source of snags and soil-logs. The numbers of trees that should be retained vary with objectives and forest-type. Prescriptions in the Pacific Northwest vary from less than 20 percent of the maximum basal area to 50 percent or more, while, in temperate hardwood forests that are managed to retain old-growth structure, 70 percent or more of basal area is retained at harvest. Group selection (multi-tree openings, generally no larger than about 0.1 ha) will likely be required with higher levels of retention in order to maintain shade-intolerant species within stands. Once again, specifics will vary with forest type. As mentioned earlier, gaps up to about 500 m2 in temperate hardwoods is recommended. To regenerate both shade-intolerant ponderosa pine and moderately shade-intolerant Douglas-fir in the dry forests of southwest Oregon, the state's Bureau of Land Management intersperses openings of several 100's m2 within a matrix in which 40 to 50 per cent of maximum basal area has been retained.

III. Landscape of the Future

Assuming that the objective is to balance commodity production with maintenance of biological diversity and landscape stability, what should the forested landscape of the future look like? In 1984, L.D. Harris proposed a basic scheme, which he called MUM, or Multiple Use Module. A MUM consists of four land classes: (1) a core reserve area, which is surrounded and buffered by (2) an area of "light-touch" management, such as selection forestry and long-rotations (we might call these "1st order buffers"), which is surrounded and buffered by (3) an area of moderately intensive management ("2nd order buffers"), which could include green-retention cuts, and perhaps some selection cuts and long rotations. The fourth category consists of other lands that are highly altered by humans (intensively managed plantations, farms, suburbs, cities).

Any given region would have several to many interconnected MUMs, depending on: (a) the number of different unique habitats that require protection; (b) the number of core reserves designated for each habitat. The regional landscape emerges when one combines three things: (1) core protected areas, including different forest types and different representatives of each type, along with their buffers; (2) protected corridors; (3) lands devoted to intensive human use. The form such a Multiple Use Landscape (MUL) might take in any one region would depend on land-use constraints, such as human population density or the degree of private versus public land ownership. Where population density or land ownership patterns restrict the amount of land that can be devoted to low-intensity use, the MUL might be as illustrated in Fig. 1a. Riparian zones are often designated as connecting corridors in such a scheme, and are important special habitats deserving protection in their own right. However, it must be borne in mind that, while many animals move along riparian zones, not all do, and hence, riparian zones alone are unlikely to satisfy requirements for movement corridors.

The MULs illustrated in Figs. lb and lc provide progressively better protection for biological diversity and, depending on the nature of intensive land use, greater

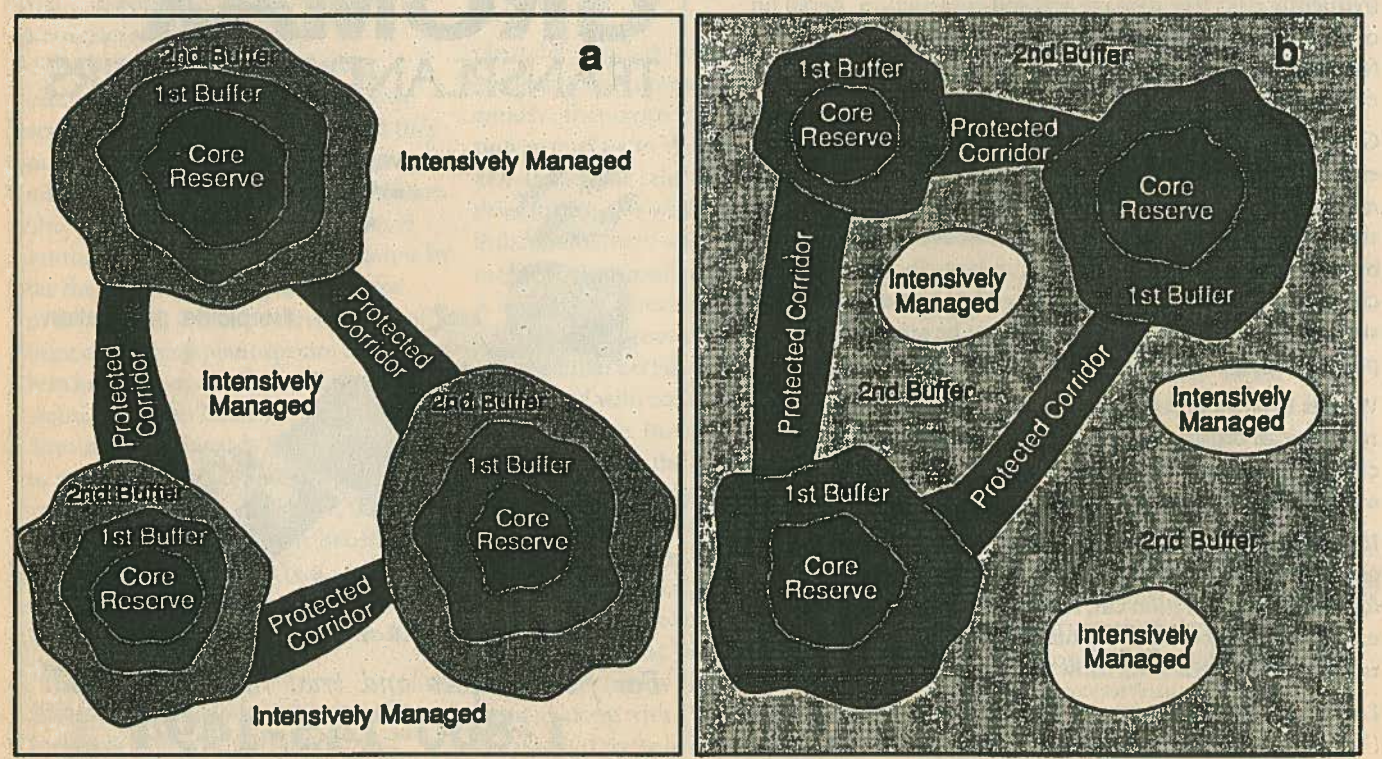

Figure 1. Three multiple-use-landscapes (MULs). Conservation of regional biological diversity increases from (a) through (c).

overall landscape stability. The MUL of Fig. lb has the same categories of land use as Fig. 1a, but core reserves, their buffers, and areas of intense use all exist as islands within a sea of moderately intense forestry, i.e., the 2nd order buffers—characterized by green retention, along with some selection forestry and long-rotation areas— have been expanded at the expense of intensely managed areas. This approach is similar to that proposed for spotted owl conservation on federal lands in the Pacific Northwest. The MUL of Fig. lc goes a step further and creates landscapes in which reserves and intensively managed areas exist as islands in a sea of "light-touch" management which is wholly characterized by density management, group selection (and perhaps some single-tree selection), and long rotations. I have proposed this scheme for federal lands in the US Pacific Northwest.

Each of the approaches shown in Fig. 1 involves tradeoffs between wood production and a suite of alternative values that includes habitat and watershed protection, aesthetics, narrow versus broad migration corridors, and perhaps long-term ecosystem stability. Compared to the landscape shown in Fig. 1a, reserves -- and perhaps all categories of land use -- in lb and lc are better buffered against catastrophic disturbance, and migration routes are spread broadly across the landscape rather than concentrated in narrow corridors. The approach shown in Fig. lc expands the habitat for those late-successional species that can tolerate some human activity and, because the dominant silvicultural approach includes long-rotations, produces future late successional habitat. I doubt that wood production can, at present, be reliably compared among these

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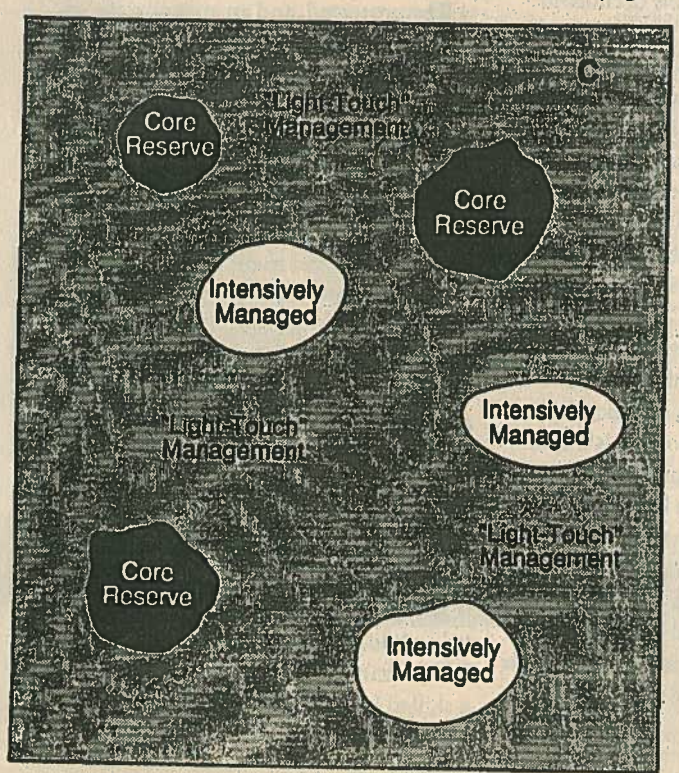

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scenarios for any forest type, because not enough is known about: (a) productivity of silvicultural systems other than plantations, and (b) the degree of risk associated with different silvicultural approaches (i.e. losses due to fire, wind, biotic pests, or impacts on soils). Considerable anecdotal evidence (not to mention common sense) indicates that the least diverse landscape has the greatest risk.

The scenarios of Fig. 1 represent three points along a continuum of possible landscape designs. Moreover, a mix of various MULs might be appropriate for any given region. Regardless of the type of MUL that is employed, allocation of land to different uses should be based on biology and ecology, as well as ownership. Gap analysis or a similar approach should be used to site core reserves and their buffers, and marginal lands (steep slopes, fragile soils) should be left untouched or, at most, lightly managed.

What scale of planning is appropriate if the objective is to maintain or restore biological diversity? Two factors are involved:

(1) the area needed to maintain viable populations of those species that need the most space (frequently vertebrates that feed at or near the top of the food chain); (2) the scale of natural disturbances. Conservation biologists are loathe to cite hard numbers about what constitutes a viable population for a given species, but the rough orders of magnitude that are cited fall in the range of several thousands of breeding individuals. For the typical large vertebrate predator, this translates into 10's of millions to 100's of millions of ha, which extends the scope of ecosystem management to regional ecosystems. (In the case of migratory animals, hemispheric perspectives are necessary.) As the scale of natural disturbances increases, the area needed to buffer late-successional species against excessive habitat loss increases. Climate change introduces new considerations: the past may no longer be a reliable guide to the future; pathways of migration must be maintained; if, as predicted, natural disturbance regimes become more severe, the risk of losing already limiting habitat is likely to increase in the future, increasing the need for maintaining what exists.

IV. Some socioeconomic implications

What the shift toward a more ecologically based silviculture means for forest-dependent communities is not yet clear. Less wood volume will be produced, at least in the short-term (but not necessarily in the long-term, if ecologically-managed forests are more resistant and resilient). However, little or no data are available to tell us what wood yields are possible under ecosystem management. Douglas-fir stands grown at low density do not culminate mean annual increment until well past 150 years of age, suggesting that, in that species at least, density management coupled with long rotations may have little or no effect on yields. Even if yields do decline under ecosystem management, which would seem to be a reasonable assumption, that does not necessarily translate to comparable declines in value. Market value per unit of volume harvested can be increased by concentrating on high quality wood products, efficient utilization of what is logged, and keeping value-added manufacturing within local communities. Nontraditional forest products may be quite valuable in the marketplace. Mushrooms are now a multimillion dollar industry in the Pacific Northwest. The recent experience with Pacific yew could be only the tip of the iceberg with regard to medicinal plants, scores of which are known to the First Nations. It is important to keep in mind, however, that questions of sustainable harvest levels exist with alternative products just as they do with trees. At present, for example, we have no idea what levels of mushroom harvest can be sustained without impacting mushroom populations or the processes mediated by the harvested fungi.

The practice of ecosystem management will, itself, provide nontraditional jobs. Properly done, more skilled labour will be used than in traditional plantation management. Planning and implementation will require detailed inventory and mapping, including on-the-ground surveys, remote imagery, and GIS. Learning and adaptation, key components of ecosystem management, must be guided by close monitoring and analysis of how systems respond to management. Many of these skilled functions can be performed by properly trained local workers, and, in fact, local communities are the logical place to find workers who are already familiar with the structure and functioning of local ecosystems.

Summary

To maintain biological diversity, and along with it the health and integrity of whole ecosystems, silviculture must do two things: protect species and habitats that have no market value; and mimic, to the degree possible, natural disturbance and successional patterns at the scale of stands, landscapes, and regions. A more ecologically based management will focus on what it leaves behind rather than on what it takes. Biological legacies will be protected, and an appropriate mix of habitats and habitat interconnectance maintained, or, where necessary, restored. Early and mid-successional communities will exist as islands within a matrix of older, more structurally diverse forests, rather than vice-versa, producing the shifting mosaic that characterized many natural forest landscapes. Silvicultural techniques for achieving this include green-tree retention, aggressive density management, and long rotations. Economic responses include: (a) shifting from high volumes of low-value wood products to lower volumes of high-value products; (b) developing more efficient techniques for wood utilization; (c) broadening the base of marketable forest products; (d) keeping value-added manufacturing within local communities; and (e) developing a skilled labour base within local communities to assist in planning, implementation, and monitoring of ecosystem management. ❖

New soil degradation guidelines for MSP: *How this will affect your business*

Marc von der Gönna, RPF, Site Preparation Program Specialist, BC Ministry of Forests
Ken Sanders, Industrial Engineer, Sanders & Company Contracting Ltd.

Introduction

Increased public awareness of the environment and scrutiny of primary resource users has led to increased concern regarding soil conservation. Soil is recognized as a fundamental building block of ecosystem function and structure. The two most important characteristics which make a soil fertile are organic matter and porous soil structure. Organic matter in the soil contains the bulk of soil nutrients, is essential to biological activity in the soil, helps retain moisture, and helps retain porous structure. As well, the surface organic matter layer, or forest floor, protects the underlying soil from structural damage and erosion. Porous soil structure encourages root growth, permits the free movement of air and moisture into the soil, is necessary for good soil drainage, and is necessary for healthy biological activity.

Two types of soil disturbance that can be very damaging to site productivity are compaction and extensive soil displacement. Compaction can be the result of machine traffic that is excessive or poorly timed, or the inappropriate choice of equipment. Soils are most prone to compaction when they are moist (wet). Soils with a high clay content are the most sensitive. Dense compacted soils restrict root penetration, disrupt infiltration of air and water, and lead to poor seedling growth.

Detrimental soil displacement is the extensive removal of the forest floor and upper mineral soil layers. Excessive soil displacement often results in the exposure of unfavourable material. In general, extensive soil displacement removes nutrients from the proximity of planted seedlings, and exposes surface soil to compaction and erosion.

Initial concern regarding soil conservation pertained to timber harvesting operations. In spring 1989 interim guidelines for timber harvesting were proposed for the Interior of British Columbia. These guidelines were a first attempt to limit area used for permanent access (roads and landings), and other disturbances throughout the cutblock, such as bladed skid roads and non-bladed skid trails. In 1993 final guidelines for Timber Harvesting were implemented for the Interior.

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Soil conservation guidelines for harvesting— Interior sites

The Soil Conservation Guidelines for Timber Harvesting— Interior sites consist of three parts: soil hazard assessment keys, a table listing acceptable limits of detrimental disturbance based on soil hazards, and definitions of detrimental disturbance.

The soil hazard keys are used at the Pre-Harvest Silviculture Prescription (PHSP) stage to assess a site's succeptability to four soil hazards relating to mineral soil. These are compaction and puddling, displacement, erosion, and mass wasting. The soil hazard keys are based on various site and soil properties such as soil texture, slope, forest floor depth, rainfall, site moisture regime, and soil coarse fragment content.

Once the soil hazards are assessed, the most limiting is then used to set the limit of allowable disturbance (Table 1). Disturbance levels are set at seven percent for access from the gross cutblock area, (ultimately this will have to change and be done on a watershed access planning basis) and zero, six, and thirteen percent for random disturbance in the remaining net area to be reforested (NAR).

TABLE 1. Maximum allowable levels of potentially detrimental soil disturbance. These levels do not necessarily equate to equal amounts of loss of site productivity.

Leading soil disturbance	Hazard rating	Roads and landings (% GCA)[a]	Total potentially detrimental disturbance (% NAR[b] by treatment unit)
Mass wasting[c]	VH	7	0
Displacement Erosion Mass wasting Compaction	VH VH VH H	7	6
Mass wasting Displacement[c] Erosion[c] Compaction	M, L H, M, L H, M, L H, M, L	7	13

a GCA = Gross cutblock area
b NAR = Net area to be reforested
c Other [illegible]
d All [illegible]
e When [illegible]

TABLE 1. Maximum allowable levels for potentially detrimental soil disturbance and maximum total displacement

Leading soil disturbance (LSD) hazard	LSD hazard rating	Forest floor displacement hazard	Categories contributing to potentially detrimental	Maximum potentially detrimental disturbance (% NAR by treatment unit)	Maximum total displacement (% NAR by treatment unit)
Mass wasting	VH	NA	All MSP disturbance types (MSP should not occur)	0	0
Displacement	VH	NA	P, WS, CG	6	15
Erosion	VH	NA	P, WS, CG	6	15
Compaction	VH	NA	P, WS	6	25
Mass wasting	H	NA	P, WS, CG	6	25
Erosion	H	NA	P, WS, CG	13	25
All other	All other	VH, H M, L	P, WS P	13 13	30 40

The forest floor displacement hazard

- Four hazards are associated with mineral soils and are applicable to both the harvesting and mechanical site preparation guidelines. A fifth hazard category, the forest floor displacement hazard, is required for determining the sensitivity of a site to mechanical site preparation.

Categories contributing to potentially detrimental disturbance

- The MSP guidelines include all categories defined as detrimental in the harvesting guidelines and add 6 new categories.

Maximum total displacement

- A limit on total soil displacement (all scalps and gouges) is proposed to limit excessive mineral soil exposure.

Table 1. Maximum allowable levels of potentially detrimental soil disturbance. These levels do not necessarily equate to equal loss of soil productivity.

Leading soil disturbance	Hazard rating	Roads and landings (% GCA)[a]	Other potentially detrimental disturbance[c] (% NAR[b] by treatment unit)
Mass wasting[d]	VH	7	0
Displacement	VH		
Erosion	VH	7	6
Mass wasting	VH		
Compaction	H		
Mass wasting	M,L		
Displacement[e]	H,M,L	7	13
Erosion	H,M,L		
Compaction	H,M,L		

a GCA = Gross cutblock area (post-harvest)

b NAR = Net area to be reforested

c Other potentially detrimental disturbance refers to skid roads, skid trails, backspar trails, unbladed roadside work areas, and fireguards

d An approved, detailed engineering and road-stabilization plan is required

e When displacement or erosion hazards are high, then bladed skid roads should not exceed 6 %.

Finally, the harvesting guidelines define disturbances deemed to be detrimental. These include things such as bladed skid roads, non-bladed skid trails, ruts (impressions), areas of extensive uniform compaction, and wide gouges.

While these guidelines were written specifically to limit disturbance types associated with timber harvesting, they apply equally to any further activities carried out on the site. Specifically, if another activity creates disturbances defined as detrimental in the harvesting guidelines, they are deemed to be detrimental disturbances and the appropriate penalties will apply. Other than harvesting, mechanical site preparation (MSP) has the greatest potential to cause detrimental soil disturbance as the objective of MSP is to disturb the soil. To build upon the harvesting guidelines and to better control the potential for detrimental soil disturbance by MSP, interim MSP guidelines were established in 1993.

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Interim soil conservation guidelines for MSP

The intent of the MSP guidelines was to build upon the harvesting guidelines to more specifically address MSP-type disturbances. The goal of the MSP guidelines is not to discourage site preparation, but rather to stop inappropriate prescriptions or treatments, and poor implementation of appropriate prescriptions. In 1993 an extensive training program was carried out to introduce the guidelines and solicit feedback. As well, benchmark soil disturbance surveys were conducted on areas representative of average or better examples of MSP. One more field season, 1994, will be used to fine tune the MSP guidelines.

...if ANY activity creates disturbances defined as detrimental in the harvesting guidelines, the appropriate penalties will apply...

The MSP guidelines have the same three-part structure as the harvesting guidelines, with three changes/additions (Figure 1). A fifth soil hazard key, the forest floor displacement hazard key, has been added. This recognizes the importance of the forest floor to seedling growth and rooting. As well, more categories contributing to detrimental disturbance — wide gouge (same as timber but restated), long gouge, deep gouge, very wide scalp, wide scalp and continuous gouge — have been added and defined. The six new categories more specifically draw lines around good MSP disturbance than the harvesting guidelines and are designed to catch the poor performers. Of the six, four always contribute to the assessed detrimental soil disturbance, and two sometimes contribute depending upon site sensitivity (Figure 2). Finally, the third change has been the addition of a limit to total displacement, i.e., all scalps and gouges, detrimental or otherwise.

Operational considerations: A contractor's perspective

These new guidelines will have a significant impact on site preparation contractors throughout BC. These guidelines can in fact be a positive influence to the industry if contractors take the initiative to train themselves and their employees in how to apply these in the field. If these guidelines are not adhered to, contractors will find themselves facing severe penalties.

The key to recognizing areas of potential hazard is to study soil types and understand the properties of each soil class. Once this is achieved a better understanding of positive soil disturbance verses detrimental soil disturbance can be achieved. Any training program being considered should focus on soils, as well as the new guidelines.

A training program that includes both office and field sessions will be essential for the 1994 season. The Silviculture Branch has put together a comprehensive course that has been mainly attended by Ministry staff. This course will be put on during the WSCA annual conference and should be attended, if possible. Further development of "tailgate sessions" is required to get this course down to the operator level where it is most required. Hopefully, this will result in further training courses throughout the Province in the spring of 1994.

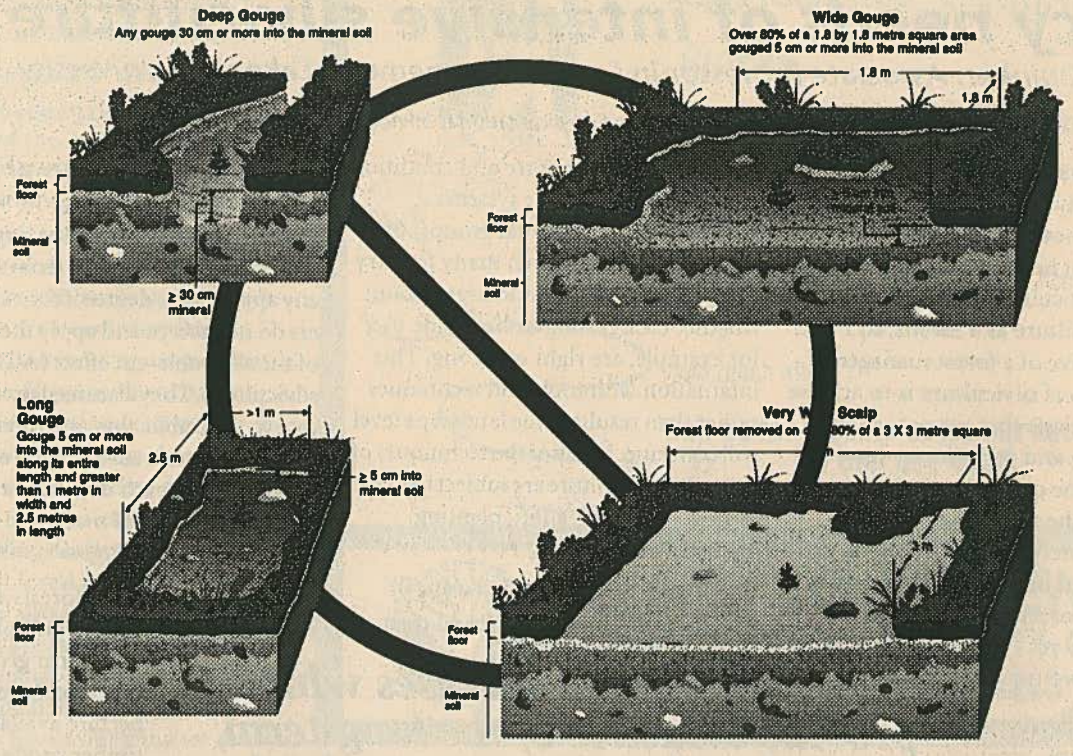
During the 1994 season, these guidelines will become an integral part of most MSP contracts. The implications of this will require assessment on a contract by contract basis. If the customer states that the contractor will be liable for any fines they receive as a result of MSP, then a contractor must be prepared to evaluate the customers treatment types and if required suggest modifications to the prescription. If the customer will not change the treatment, and the contractor cannot meet the site preparation objectives and stay within the guidelines, then signing the contract creates a liability that may have far-reaching effects.

Future issues

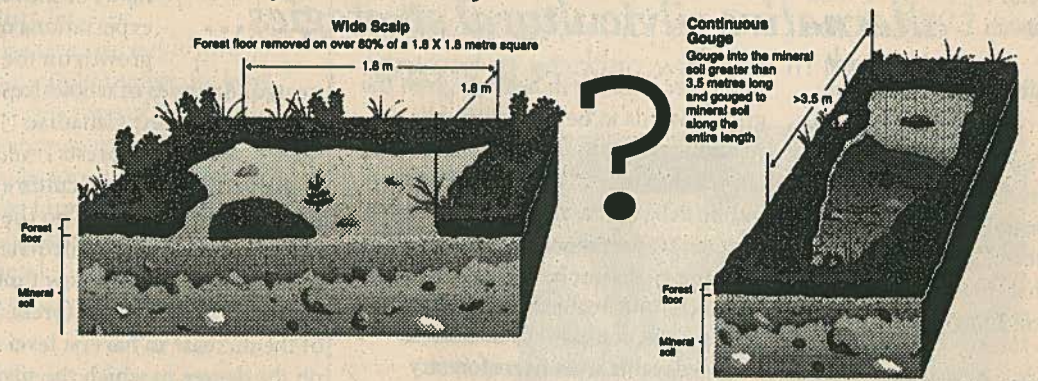
The question of penalties and liability will be a major one for MSP contractors. The highly publicized Forest Practices Code has a major emphasis on soil conservation, and will contain the empowering legislation for stiff penalties. Ultimately a provincial standard will be adopted which will blend coastal and interior guidelines. Soil conservation guidelines are here to stay, and the successful contractors will be the ones who take the time to understand the ramifications they will have on their business. ❖

New Categories

Always considered detrimental



Sometimes considered detrimental
– determined by site sensitivity



What will it take?
Policy needs of intensive silviculture

Peter N. Duinker, Associate Professor in Forest Management, Lakehead University

Note: This is an edited version of a paper prepared for the Second National Silviculture Conference, September 1993, Toronto.

Silviculture can be seen simultaneously as one person's means and another person's ends. The former might be the forest manager, the latter the silvicultural contractor. I regard silviculture as a means, so I take the perspective of a forest manager. If the objective of silviculture is to achieve forest conditions that support a target wood supply and other forest-level goals, then the question of whether silviculture should be intensified depends entirely on how much silviculture is needed in a particular forest to achieve the forest goals. There is no generalizable yet sensible answer to this question.

However, I am willing to reflect on the conditions I think would have to prevail in Canada before more-intensive silviculture would be practised.

In the following notes, I will identify several conditions that would need to be met for increased implementation of intensive silviculture, and then reflect on the policies that might be helpful in bringing those conditions about.

Conditions for more-intensive silviculture

1. Public and professional acceptance of intensive treatments

In my view, debates about forest management ought to focus on objectives to be achieved, especially regarding the condition and structure of the evolving forest landscape. Debates that focus on the desirability of forest practices usually lose sight of what impacts those practices have, collectively on forest structure and condition and on socioeconomic systems. However, environmental groups, the general public, and even many forestry professionals still want to argue about whether clearcutting or herbicide use, for example, are right or wrong. This infatuation with tools and techniques rather than results at the landscape level will continue. Many of the techniques of intensive silviculture are subject to these debates — scarification, planting, chemical tending, etc.

Can people be convinced that any ill effects of intensive silvicultural treatments are well worth bearing given the great rewards to be gained? Public relations efforts and adversarial approaches to bringing science into public debate, like the Class EA for Timber Management on Crown Lands in Ontario, do not help much. We need more: (a) touring of the woods by the public in the company of dedicated, knowledgeable and sincere forestry professionals; and (b) quantitative analyses which provide evidence as to the long-term, broad-scale consequences, both desirable and undesirable, of alternative silvicultural strategies. Woodlands tours are becoming prevalent across the country, a very welcome sign. We are still woefully short of good studies, especially quantitative case analyses, of what might be lost and gained by changing silvicultural strategies. Research policies and programs could use some redirection.

...we need more analyses which provide evidence of the long-term, broad-scale consequences, both desirable and undesirable, of alternative silvicultural strategies...

2. The so-called allowable-cut effect of silviculture

I believe that silviculture on large forest estates in Canada will never intensify to any appreciable degree if forest managers do not accept and apply the concept of the allowable-cut effect (ACE) of silviculture. They also need to communicate to the public that any forest has a range of possible sustainable (even-flow) harvest levels, each dependent upon a defined program of management inputs and actions, including silviculture.

Harvest levels in large forests are always set on the basis of expectations of long-term growth of timber on every hectare available for timber production. Silvicultural treatments are strong determinants of the forester's expectations of timber growth on the areas treated. Analyses of whole-forest dynamics in many Canadian timber-producing forests reveals that implementation of silviculture today to improve timber growth on the treated hectares permits an immediate increase in the long-run, even-flow timber harvest from the whole forest. The size of the increase in harvest level depends on the degree to which the silvicultural treatments alter stand-development patterns, where the treatments are applied, and on the initial structure of the forest, particularly its type and age-class structures. This means that silvicultural treatments are justified not on the basis of what benefits they might bring on the treated areas alone, but rather on how the responses on the treated areas permit adjustments in management, particularly the scheduling of timber harvests, in the rest of the forest. Silvicultural treatments in much

of Canada are a money-losing proposition, as investments securing future gains, on a hectare-by-hectare basis, but in many cases can look financially attractive on a whole-forest basis.

Some will caution that we have too little information to make good projections of the timber-growth responses of Canadian stands to the wide range of silvicultural treatments available. Thus, forest-inventory projections based on more-intensive silviculture are extremely uncertain. I agree, but we are uncomfortably ignorant about stand responses to any kind or level of human disturbance. Projections of the behaviour of current forest stands, and of natural regeneration following clearcutting, are as uncertain as those of intensively treated stands following timber harvest. Thus, forest harvest levels based on low-intensity silviculture like natural regeneration are shaky, too. Under all circumstances, we must be cautious in yield projections, for it will be better in the future to have something we don't need than to need something we don't have.

Will forest managers, and particularly forest scientists, let go of hectare-by-hectare analyses to justify or reject silvicultural alternatives for large timber-producing forests? Perhaps this will happen when provincial agencies in charge of public forest land insist on volume-based forest simulation as a basis for establishment of both timber-harvest levels and associated silvicultural programs. Ontario has yet to do this.

3. Favourable relationships between timber demands and the timber landbase

The demand for timber from Canada's forests could go down, stay the same, or increase. Demand forecasting is a risky and complex business, but the most likely scenario for me is that demands will increase. Similarly, the landbase available for timber production could increase, stay the same, or go down. I'll put my money on the landbase shrink-

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ing somewhat in the next decade.

If these trends come to pass, things will look good for the silviculture industry. It is hard to imagine how timber demands could be met over the long haul if the timber landbase shrinks and silviculture is not intensified somewhat. To look at the situation perversely, perhaps the silviculture industry should lobby hard for withdrawals from the timber landbase. To keep the Canadian forest-products manufacturing industry going, silviculture would have to be intensified. Perhaps a case could be made this way: if the people of Canada want more forest land protected from timber management (as well as wanting vigorous amounts of industrial activity and employment based on wood), they may well at the same time have to accept intensification of silviculture on many lands remaining in the timber landbase.

Policies that remove forest landbase from timber production, and that favour increases in the industrial processing of wood, will lead to intensification of silviculture.

4. Higher monetary value for roundwood

Intensive silvicultural treatments represent substantial costs to forest managers. Monies to pay for such treatments would have to come directly or indirectly from timber sales or wood-products manufacturing. Provincial and federal coffers are unlikely sources, given current and projected deficits.

Of course, one can only charge for roundwood what the market will bear, or else there would be no transactions and thus no market. But in many parts of Canada, there is hardly the type of roundwood market, on the stump or deliverable to millgates, where vigorous competition exists with many independent buyers and many independent sellers. Many have argued that Canadian roundwood is priced too low, and if it were priced higher, more-intensive silviculture could be afforded. So why not jack up the price? Well, can Canadian industries remain internationally competitive and pay more for roundwood? This is highly company- and product-dependent, so a general answer is meaningless.

Whatever the complex cause-effect linkages in the economic system, I conclude that the money to pay for more-intensive silviculture will have to come from sales of wood and wood products. More money from such sales can only come from more volume sold or higher unit prices. The key for silviculture will be to ensure that, if more-intensive silviculture is desired and intended, the increased revenues from roundwood and wood products do indeed go to silviculture.

...the key for more-intensive silviculture will be to ensure that the increased revenues from roundwood and wood products do indeed go to silviculture...

5. Responsibilities for undertaking and paying for silviculture

I believe it was wise in recent decades to have Canadian industrial timber-tenure holders, who would harvest wood from public forests, also plan and execute regeneration silviculture. Wiser still in my view is to have the tenure holder pay for the treatments. This begets efficiency in meeting forest objectives, but also puts production costs in the hands of the institution driven by profit motive. If the cost of units of input is exceeded by the revenues of the additional units of production that result, the profit-motivated institution will bear the costs. What incentives do public owners have to bear silvicultural costs on public land, especially when wood seems to have a low price? Profit-motivated institutions like private-enterprise, timber-tenure holders at least can search for profit-producing possibilities from silviculture when they bear the costs.

There are several ways to set up timber-tenure arrangements for public land where the tenant bears silvicultural costs. I favour the idea of private enterprise renting the productive structure of a forest landscape from government. The productive structure includes not only the land but also the current forest, because the timber-producing potential of a forest over the short term (say, a few decades) is so strongly determined by the type and age-class structure of its component stands. At any instance, not all cubic metres of timber growing stock in a forest are equal in ability to produce new growing stock. There are strong differences among stand types (tree species) and tree ages.

The tenant (forest-management company) and landlord (government) would use the same forest inventory and analytical framework to explore alternative timber-production possibilities and future forest structures, on the basis of which they would negotiate (a) the annual rental price, (b) the desired forest structure to be maintained through the duration of the contract, (c) how broad-scale disturbances like fire and insect infestation will be dealt with, and (d) any basic ecological stewardship requirements affecting forest practices. The tenant would be free to determine timber harvest levels and silviculture programs. The assumption is that a wide range of timber harvest levels and associated silviculture programs could be implemented by the tenant while the tenant meets all the conditions specified in the contract, especially the maintenance of the required forest structure.

Conclusions

Will more-intensive silviculture automatically happen even if all these conditions are met? I believe it will be facilitated, but not by definition there-

fore practised. To recap, the conditions that will help are:

1. acceptance of the practices of intensive silviculture by the public and by forestry professionals;

2. acceptance of the concept of the allowable-cut effect of silviculture;

3. a shrinking timber landbase or increasing demands for roundwood;

4. higher prices for roundwood; and

5. having those who receive revenue for harvested roundwood pay for silviculture.

But have we been tackling the right question? Should the future be full of intensive silviculture across Canada? Silvicultural contractors might say yes. Many others would say no, and yet others would say it depends— in some cases yes, in others no. I am in this last group. My only firm conclusions on this topic are:

1. Intensive silviculture ought not to be pushed by technique practitioners or proponents— it is attached to a rope that must be pulled by forest owners and managers.

2. There are several plausible scenarios under which conditions for the widespread practice of more-intensive silviculture could occur. Some policy shifts could help create these conditions.

3. From a forest-management point of view, what we really want, everywhere, is not more-intensive silviculture, but rather affordable. smart silviculture— the gentlest intrusions into forest ecosystems that get the required job done. ❖

Recent silviculture activities and accomplishments in Québec

Michel Tremblay, Directeur des techniques d'intervention, Ministère des Forêts, Québec

Note: This is an edited version of a paper presented at the Second National Silviculture Conference, Toronto, September 1993.

Québec's public forest system: Basic principles

On December 19, 1986, Québec's National Assembly passed a bill that received assent as the Forest Act. This Act, which came into force on April 1, 1987, introduced a new forest system for Québec, abolishing a system that had been adopted more than a century before.

A new sharing of responsibilities

The new Act requires the Québec Government and the forest industry to share responsibility for the management and protection of forests in the public domain.

The State plans, standardizes, coordinates and controls public forest management activities, while the industry, in accordance with its contract with the Government, is required to comply with the Act and the regulations, to plan and carry out management activities and, with the Government, to contribute to forest protection.

Multiple-use of the forest environment

Québec gave itself the power to apply strict management standards so as to ensure the protection of the various forest resources, as well as of specific sites, which is essential to achieve multiple-use of forest environment.

In its role as a manager of lands in the public domain, the Government has drawn up the land use plan, a cartographical document that identifies the potential of various territorial units, their respective vocations and any sites requiring special protection (parks, ecological reserves, essential wildlife habitats, cultural and archaeological sites, etc.). In addition to the map, the Government has made, for each site or resource to be protected, regulations to define specific management standards to be applied by everyone involved in public forest management. This philosophy forms the very base of the forest system.

Compliance with the sustained-yield principle

To replace the various forms of tenure or allocation existing before April 1, 1987, the Forest Act introduced a new type of management based on timber supply and forest management agreements or TSFMA.

The TSFMA entitle holders to obtain an annual forest management permit to harvest a volume of round timber of one or several species on the forest land described in the agreements, in order to supply their wood processing plants. The holders undertake to fulfil their obligations under the Act and the agreements, and to carry out silvicultural treatments necessary to achieve the annual yields specified in the agreements for each area earmarked for forest production.

Reorientation of the forest regeneration method

What we are talking about here, of course, are softwood forests since we do not normally experience much difficulty with natural regeneration of hardwood forests, as long as our tending methods are adapted to their structure and composition.

In our softwood forests, however, deficiencies sometimes have to be compensated to achieve satisfactory regeneration.

Increased reliance on natural regeneration

Pre-harvest or post-harvest regeneration is best suited to the natural process. Generally speaking, it is also the best adapted to the site, and it occurs to an interesting degree on a large proportion of softwood harvesting areas. We will thus be mainly relying on this type of regeneration in the future, to ensure the renewal of our softwood stands.

...a felling technique known as "harvesting with advance-growth protection," almost unheard of before 1987, is now used in more than half of Quebec's softwood harvesting areas...

Over the last five or six years, timber supply and forest management agreement holders have already made significant changes to their harvesting techniques. A felling technique known as "harvesting with advance-growth protection," almost unheard of before 1987, is now used in more than half of Québec's softwood harvesting areas. The Government is currently looking into the possibility of amending the regulations to make this technique compulsory in all harvesting areas.

Natural regeneration, where insufficient to meet production objectives, will be supplemented by reinforcement planting (more than 12 million seedlings were used for this purpose in 1993). Plantations — that means to plant 1,875 seedlings or more per hectare — will be established to help meet increased production objectives or where natural regeneration is too slow.

The proposed forest protection strategy

In February 1989, Québec's Council of Ministers decided to introduce a forest protection strategy. The aim of the strategy was to provide guidelines for achieving sustained timber yields, and suggest ways and means of reducing pesticide use in line with the August 1989 policy statement on pesticide use in forests.

To take account of the concerns expressed by the population at public hearings on planned aerial insecticide spraying in forests, the Council of Ministers asked the Bureau d'audiences publiques sur l'environnement (BAPE) to carry out hearings on the draft strategy.

The hearings took place in 1991, in a series of 21 public sittings held throughout Québec.

The 73 proposals retained in the BAPE report were rigorously analyzed by the Ministère des Forêts, and a memorandum was subsequently submitted to the Council of Ministers to obtain its approval for the suggested guidelines of the Government's forest protection strategy. The Council of Ministers has not yet reached a decision.

Preventive silviculture

One of the department's proposals is concerned with improving the resistance of timber stands to insects and diseases by reducing the relative importance of species vulnerable to these disturbances and by improving the health of standing trees. The department has also proposed preferential harvesting of forests which, because of their characteristics, would require significant protection programs during future insect epidemics.

To eliminate phytocide use, the Ministère des Forêts has proposed the following measures:

- Annual planting of 40 million large seedlings, beginning in 1997; large seedlings have a minimum height of 40 cm, a neck diameter of around 6 mm and an H/D ratio between six and seven;

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- Protection of young tress growing under mature forest canopies during harvesting operations;
- Planting soon after harvesting on areas where it is required; the maximum period suggested is two years;
- Mechanical clearing of softwood regeneration growing under hardwood canopies;
- Adjustment of harvesting methods and techniques to provide greater protection for wet lands and thin soil covers.

Pesticide Use

Insecticides

With respect to insecticide use, the Ministère des Forêts has made the following proposals:

- Exclusive use of Bacillus thuringiensis (B.t.) or other biological insecticides to fight against the spruce budworm;
- Analysis of all available means for controlling other insects. The product or products to be used would be selected on the basis of their safety and performance in environmental and forest terms. In fact, since 1992, the Societe de protection des forêts contre les insectes has used only B.t. as an insecticide.

Phytocides

The Ministère des Forêts has recommended the elimination of chemical phytocides over a ten-year period. This period reflects the time required for the effects of the preventive measures provided for in the phytocide elimination strategy to be felt. The principle measures recommended are the production and planting of large seedlings, changes in harvesting procedures and forest management, and the acceleration of research into the development of biological products.

Although the plan to abandon phytocides within ten years is very ambitious, it only partly satisfies the demands of citizens, who would like to see them disappear more quickly. Forest managers, on the other hand, would like to be able to go on using them.

Distribution of harvesting areas

With respect to the time-space aspects of harvesting area distribution, the Ministère des Forêts is considering making the following proposals:

- To avoid juxtaposed harvesting areas until the regeneration in the harvested area reaches a certain height class;
- Preservation of the essential elements of wildlife habitats;
- Constant preservation of a certain percentage of the forest canopy, determined by the type of stands, on each territorial reference unit;
- Reduction of the current maximum clearcut area of 250 hectares.

...although the plan to abandon phytocides within ten years is very ambitious, it only partly satisfies the demands of citizens, who would like to see them disappear more quickly...

Research and development

The Ministère des Forêts also suggests an increase in research into prevention and elimination. In our view, it is important to achieve a better understanding of certain silvicultural practices in order to minimize the problems caused by competing vegetation, insects and diseases, and by the fragility of some environments.

Forestry research is already focused on the dynamics of competing vegetation, the testing of different types of mulch and mechanical maintenance methods. New production and planting methods for large seedlings are also being studied: storage conditions, seedling nutrition management, fertilization schedules and container types.

Through research into the dynamics of spruce budworm populations, we hope to be able to forecast the insect's migrations more accurately. The results obtained in the development of new, more effective types of Bacillus thuringiensis (B.t.) are extremely encouraging, and will almost certainly bring about a reduction in the amount of insecticide needed.

Integrated resources management

In 1991, the Québec Government launched a project to develop integrated forest resources management. The aim of the project is to trigger changes in attitudes among managers, users and the population in general.

The concept of integrated resources management is easy to understand in forestry terms. It consists in bringing the characteristics of the different environmental elements together under the same umbrella of concern, in order to measure their interdependencies and avoid situations where action in one field leads to problems in others. However, while the concept may be easy to understand, it is extremely difficult to put into practice.

Analysis is restricted to three forest resources:

- the forest itself;
- wildlife;
- water resources.

Conclusion

The approach to which Québec is now firmly committed will enable it to use its forest resources in a way that respects modern environmental concerns, while allowing the forest-related economic activities to flourish. ❖

Draft Recommendations for FRDA II Budget

FRDA II Advisory Committee

Based on a $19 million reduction to the FRDA II budget over the remaining years, the following summarizes the recommendations of the December 10, 1993, FRDA II Advisory Committee. As the committee did not endorse a standard cut across all areas, we recommend that all programs be reviewed according to the following guidelines and that funding be focused on well-managed effective projects that support key priority areas.

Budget review guidelines

The committee recommends that the following be used to analyze program activities to identify those that would be considered most favourably in the budget review. These guidelines are not in order of priority.

1. Projects that are well-managed, effective and have a high ability to deliver the final product.

2. Projects that are strategic in nature versus the operational responsibility of existing agencies.

3. Projects that have demonstrated sound budget management.

4. Projects that do not have access to alternative funding sources.

5. Projects that have recruited funds in addition to FRDA, thereby resulting in high return for the FRDA expenditures.

6. Projects that support high priority initiatives, e.g, Forest Practices Code, Forest Sector Strategy, Timber Supply Review and Protected Areas Strategy.

7. Projects that require the completion of planned expenditures realize benefits from the investment to date.

Other Recommendations

In addition to the above guidelines, it is also recommended that all programs and sub-programs should be reviewed:

- for their achievement of FRDA objectives
- for efficiencies

Projects and proposed budgets be reviewed to identify if the maintenance of the project is economically viable or whether deletion would be equally as effective.

Priority Areas

The FRDA II Advisory Committee recommends the following areas as the highest priorities for support under the FRDA II Agreement.

- Research of methods and criteria for an effective, transferable forest inventory
- Maintenance of public education initiatives
- Research of the socio-economic and biophysical implications of the wide range of forest management options, i.e, harvesting, recreation, protection, etc.
- Maintain research in IRM and silvicultural system alternatives to clear cutting

While many specific issues were discussed as to whether they should be funded under FRDA II, it was felt that the application of the set of guidelines should direct the Management Team.

The following areas were discussed as to their appropriateness for future FRDA financing and, therefore, should be closely scrutinized under the guidelines. Included are:

- Standard silvicultural practices
- Research of forest industry markets
- Job training initiatives due to potential alternative sources
- Forest inventory

In closing, the FRDA II Advisory Committee strongly recommends that all projects be reviewed against these guidelines.❖

Global wood supply dilemma ahead

Dirk Brinkman

In Chiapas, Mexico, an indigenous peoples armed uprising on New Years Day demanded access to local resources, including firewood and land to grow corn, which they see being traded north under NAFTA. The Mexican army's brutal response during the past week resulted in hundreds of deaths— mostly among Zapatista rebels.

Comments made by James A McNutt, Rainer Haggblom, Kari Ramo of Jaako Poyry in 1992 highlights the unique dilemma of the global forest land use conflicts illustrated when a third world country joins two developed countries in a free trade agreement.

"The predominant wood fibre use globally is still fuelwood and the trend in increasing steadily. The closed forest is slowly increasing in most of the industrialized countries, as marginal agriculture land is being reforested. In the tropical and semi-tropical regions, shifting cultivation cultures and reckless exploitation for fuel, household, and industrial wood products is generating a loss of closed forest that amounts to 15 million hectares per annum. Developed countries have a per capita distribution of closed forest that is nearly three times that for the developing countries. The population growth rates for the developing countries is more than twice that for the developed countries which illustrates the true dilemmas we must face in the years ahead."

As Ovid Mercredi heads south into this third-world war zone with which we have joined hands, it is easy to see that the dynamics of this dilemma will be reflected in our conflicts at home. The media fixated North American public will likely sympathize with these new champions of aboriginal self-government who have such a desperate cause and are suffering ruthless repression. ❖

National silviculture industrial adjustment human resources study

Human resources study initiated

Dirk Brinkman, President, Canadian Silviculture Association

Note: Letter sent to George Jaremek, Chief Systems and Program Linkages, Human Resources and Labour Analysis Canada, October 1993.

I have asked Jim Verboom, as Vice President of the CSA, to take a leadership role in initiating a national Industrial Adjustment Services (IAS) study.

After much discussion with the representatives of the CSA at the Second Canadian Silviculture Conference last month, we are confirmed in our recognition of the need for a national human resources study of our industry.

Such a study will help Government develop the appropriate intervention to stimulate the development of a world-leading, competitive cluster of silviculture expertise and services in Canada.

A national IAS study would identify the training and other problems that will help further this development.

Thank you again for our meeting. I am directing my specific responses to your concerns through Jim Verboom. ◆

Canadian Silviculture Association

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IAS debate continues

Jim Verboom, Canadian Silviculture Association, Nova Scotia

Note: Exerpts from letter sent to George Jaremek, Chief Systems and Program Linkages, Human Resources and Labour Canada, October 1993.

Subsequent to your meeting with Dirk Brinkman, and primarily during discussions at the Second National Silviculture Conference in Toronto, the importance of these and further issues have been confirmed. There is a resolve among our directors that a national IAS must be undertaken to address these issues.

The current New Brunswick IAS into silviculture contractors has clarified the high value of this process.

This coordinated national IAS would identify possible solutions to the common issues facing our industry, as well as specific issues facing each provincial sector. Since many of the Human Resources issues in our industry are the product of each province's policy and regulatory framework, they are consequently different in each province. We feel, therefore, that the study should look at each province individually to see how they are handling the issues identified nationally. It seems each province currently has part of the answer to our national issues.

From our recent discussions we have identified the following major issues of national importance:

1/ Post FRDA Environment— In many provinces our industry was given birth to and nurtured by the Federal-Provincial FRDAs. It appears they will soon end. How can we adapt to keep our industry alive? How will our activities be funded? What is the future for those who will lose their livelihoods?

2/ Changes in Silviculture Practices— In many provinces, there is a major shift from Artificial to Natural regeneration. What are the impacts on our Human Resources? In what way will our work force have to adapt?

3/ Changes in the Provincial Regulatory Framework— There is a policy shift taking place in many provinces, with silviculture no longer funded by government revenue. It is being regulated and enforced on the harvesting sector. This is dramatically changing the way we do business. What are these changes? What changes are needed and expected in the skills of our people?

...continued IAS Debate

4/ Mechanization— Those parts of our industry that produce wood products in the process of carrying out silvicultural treatments are faced with major changes as machines start to take over. How much of our work may be done by these machines? How will that effect our Human Resource needs?

5/ Ecological Developments— The rapid changes in environmental laws and guidelines are quickly changing the demands being placed on our workers. What training is required? Can we adjust? What must a worker or contractor be able to do to help?

6/ Job creation Projects— What will be the effect of programs like the BC21 initiative on the existing industry? Will our society really gain by using this approach?

7/ Job Turnovers— Does our industry have an unusually high employee turnover rate? Is it desirable? Is it avoidable? Are there alternatives to seasonality?

8/ Tendering— Different approaches to tendering in different provinces has led to a range of experiences in efforts to get the best quality work possible for the lowest price possible. The national industry could gain a lot from looking at the strengths and weaknesses of each province's approach.

9/ Certification— Our industry is using certification in one or two provinces. Is there a value in this for the rest of Canada? Should we have national certification of contractors? Trainers? Workers?

Major changes in our industry will require huge investments in training and retraining. If we don't know who we are training or what we are training ourselves for, then much of that investment will inevitably be misdirected.

A nationally directed IAS will give us the facts that the leaders of our industry need to guide us through the huge changes in store for us during the next few years. ❖

Silviculture certification committee

Jim Verboom, Vice-President, CSA

The National Forest Strategy commitment 6.5 calls for an assessment of the feasibility of a certification system for silviculture and forest workers in Canada. To this end, a committee was set up which was comprised of one government representative from each province and two from Canadian Forestry Service, DNR Canada.

The Canadian Pulp and Paper Association was asked to participate but declined when a survey of their members showed a majority were not interested in certification of workers. The CSA is represented by Dirk Brinkman and Jim Verboom.

It is premature for the CSA to take a position on certification, although the WSCA has expressed concerns over whether there are sufficient potential benefits to outweigh the pitfalls and costs of such a system. The Nova Scotia Silviculture Contractors Association, having seen the benefits of certification of contractors since 1983, sees more potential in this possibility. However, it also wants to study the subject further. All provincial associations need to hear from their members on this subject.

Additional achievements of this committee are the Green Binder — a listing of all silviculture working training courses in Canada — and the Green Table Agreement — a commitment to share training programs and materials between provinces.

This committee also picked a short list of names to be recommended to Human Resources Canada to be the Steering Committee for the silviculture IAS study. This new committee will be asked to address, among other things, commitment 6.1 of the National Forest Strategy, namely a forecast of employment and training needs in the silviculture industry. ❖

National silviculture occupational standards

A.A. Rotherham, Director of Woodlands, CPPA

Note: Letter sent to Norma Burlington, Senior Advisor, Policy and Strategic Issues, Canadian Forest Service, November 4.

I have just completed a program of consultation with industry representatives on the subject of a national program to certify silviculture workers (your 6.5 committee).

There is practically no support for a national certification program for silviculture workers.

There is good support for training programs for silviculture workers, presumably with the awarding of some sort of diploma for successful completion. These training programs would, presumably, be organized at the provincial level.

Sylvain-Yves Longval believes that there may be a place for a "National Occupational Standard" for silviculture workers which would state the subject or areas of knowledge and competence required to perform the jobs done or expected of a silviculture worker. This would help in the design of education and training programs.

Based on the opinions expressed to me, I have no mandate to participate on the committee. I ask that you inform the other members of the committee that the industry does not support a national certification program. The industry does support training. Consider working on a National Occupational Standard. ❖

Appeal for new FRDA strategy

Canadian Forestry Association, Canadian Federation of Woodlot Owners, Canadian Institute of Forestry, Canadian Silviculture Association, Wildlife Habitat Canada

Note: This letter was sent by the above organizations to Kim Campbell, then Prime Minister of Canada, August 25 in response to the Conservative's announcement that they would not be renewing any of the FRDA agreements.

We wish to applaud the federal government for its leadership role in forestry in the 1980s and 1990s. The continuing support of forest management through federal/provincial agreements, the establishment of a federal department of forestry, the diligent work of the House of Commons Subcommittee on Forestry, and the development of a National Forest Strategy which reflects changing social values — these are all worthy accomplishments.

However, the April announcement by Don Mazankowski that the long-standing Forest Resource Development Agreements will be phased out over the next three years presents a serious setback to the momentum generated over the last decade.

We recognize the need for fiscal restraint, but such a step fails to recognize the significance of the forest to our Canadian environment and of the forest sector to our Canadian economy. Forestry contributes more to our net balance of payments than agriculture, fisheries, mining and energy combined. The federal government cannot meet its goals without a strong forestry sector.

As a forestry community with diverse interests but a common vision, we look to the federal government for continuing leadership in the sustainable development of our Canadian forests. This leadership was exemplified in the many participatory processes which culminated in the National Forest Strategy and the Canada Forest Accord — unprecedented partnerships forged among the federal government, provincial governments, the forest industry, the wildlife conservation community, academia, professional foresters, aboriginal interests, silviculturists, environmental groups and woodlot owners. Collectively and in partnership, we committed ourselves to the sustainable development of our forest resource for the social, environmental and economic benefit of all Canadians. We directly addressed such issues as biodiversity, carbon balance and global climate change, rural and urban employment, stability of 350 forest-dependent communities. We were able to be a model for the rest of the world.

But with the withdrawal of the federal/provincial Agreements, our efforts to enhance our international image abroad have been undermined, lending credence to the "Brazil of the North" misnomer being promoted by some, at a time when our foreign customers are scrutinizing our forestry practices.

We are not requesting a reinstatement of the status quo. We do wish to know what alternative strategy to the FRDAs this government has planned, which will accomplish the economic and environmental objectives outlined above. If your government has no such plan, we offer our services to cooperatively and collectively develop one. New and innovative mechanisms are needed.

In this decade of consultation, cooperation and partnerships, our organizations, representing over half a million Canadians, are eager to help. We therefore look forward to your positive response. ❖

Notes on the 1993 National Silviculture Conference

Dirk Brinkman

Too many of you missed an informative and formative national silviculture conference. Your absence from this collective expression of progress and problems diminished our power to change the way we manage our forests

The selection of Ontario as conference location should have put the inadequacy of the province's silviculture policies in the national spotlight. That did not appear to occur, although the impending conference may have contributed to the timing of OMNR's July decision to enter into negotiations to transfer the responsibility for forest renewal to the forest industry.

It was not surprising that the Ontario Minister of Natural Resources was late for his talk. He was attempting the impossible— put a good face on their "new silviculture direction" that drastically reduces planting and mulches seedlings. Some Ontario silviculturists are now calling it "voodoo silviculture".

CSA/CIF intends to hold the 1995 conference in Nova Scotia's Acadian area in a more arboreal setting. The 1993 conference speakers and delegates were stacked in concrete boxes around Pearson airport— perhaps suitable for the province with the highest proportional urban population. There was little to remind us of the once vast forests of southern Ontario.

I went to the conference still disturbed by the Canadian Wildlife Association (CWA) proposal to replace intensive forestry with "extensive forest management," presented at the 1993 CPPA Woodlands conference. Extensive forest management with 'soft silviculture' and 'natural regeneration', seemed like an irresistible excuse for deficit-prone provinces to do nothing.

I did not think that I would be able to reconcile the CWA version of managing for biodiversity with my vision for a "Great Ecological Wall" of uniform high value free-growing stocking standards across Canada (published in the October 1993 issue of *Forest Industry* Magazine).

I am pleased to report, however, that through the conference I experienced a new vision that brought together practical forest ecosystem management with respect for biological diversity. Dr. David Perry from the University of Washington, made a presentation about where this debate is evolving to in Washington and

Oregon state. This vision includes intensively managed stands in an extensively managed forest continuum with patches of old-growth preserves where all processes are allowed to flow on their own. The US does not have a lot of unfractured forest remaining for this meta-management approach. In Canada, on the other hand, we can still learn from our neighbours.

Of course, this conference also echoed the theme of the older generation of foresters: "We need to educate the public so they understand what we are doing." This is the theme of foresters who are not listening to what the public is really saying and refuse to admit there is anything wrong with forest management today.

As with many conferences, there were concurrent sessions, forcing the delegate to choose—often between two interesting speakers. Here are a few notable quotes from some of the speakers I heard:

David MacLean, on biological control of pests:
"We are simply unable to prioritize the province-wide planning required to moderate the outbreak of pest populations... We will need protection to keep up to 50% of future yield... In general, uneven age silviculture will have benefits for a number of major problem pests."

Robert Wagner, OMNR
Vegetation Management:
"We know almost nothing about the plants we are killing... We have a greater knowledge base with herbicides. Over 70% of all articles have been about herbicide in the past twenty years in the major vegetation management journals."

Dr. Walt Klenner, Ecologist Kamloops:
"Naturalize, not optimize wildlife... Patchiness in intertree spacing is needed... For healthy second growth, 20% of the old growth needs to be left... "

Bob Wines, Daishowa-Marubeni:
"Hardwood regen is required for browse. Herbicides reduce browse... Sheep are competition for deer and damage water course banks."

"To manage for snags is an investment in forest health. Snags reduce rabbit, vole and insect damage... We need pre-human influence habitat supply dynamics and balance to examine."

Matthew Wright, Christmas Tree Association:
"In 1956, 12 million Christmas trees were sold into the US; now there are 4 million sold into the US market of 46 million... There are two trees ready to cut for every one that will be bought— a huge over-production."

Fred Von Althen, OMNR hardwood specialist :
"We have found hardwood does not grow well without herbicides if there is grass."

Donald O'Brien, New Brunswick:
"We girdle to create habitat trees." ❖

Nova Scotia Report

Jim Verboom, Vice-President, CSA

Association of Woodland Trainers NS chapter

The Association of Woodland Trainers (AWT) is an organization of persons from industry, educational institutions and government who share a common interest in training and development of the labour force in the forest industries of Canada and the United States.

Its purpose is to provide a means for professional development in woodlands training, to assist people involved in the training of woodlands personnel with the design and implementation of training programs, and to assist in the development of new techniques.
Nova Scotia is forming the first provincial chapter of the AWT. Many of the trainers in NS have expressed an interest in having a collective say in the development of training and standards in their industry. Training administrators are actively encouraging the chapter's formation.

Membership is open to anyone involved with the development, management or implementation of forestry training programs. This year's President is Robert Young who works at Nova Scotia's DNR in Truro.

Further information can be had by writing Association of Woodland Trainers, c/o Forest Products Accident Prevention Association, Box 270, North Bay, Ontario, P1B 8H2.

AGM of NSSCA

The Annual Meeting of the NS Silviculture Contractors Association will be held March 29 at 5 p.m. in Truro. It will be held during the eighth OES at Keddy's Motor Inn through March 29 to 30.

White Birch and Acid Fog

Research done by DNR Canada in New Brunswick has shown an apparent link between acidified fog in the Bay of Fundy and an increase in White Birch Dieback and foliar browning. For further information, contact DNR Canada, PO Box 4000, Fredericton, NB, E3B 5P7 or fax (506) 452-3525. Ask for Impact Note #6.

Advisory Committee to Canada— NS CAFD

In a bold, groundbreaking move, the Coordinating Committee of the Canada-Nova Scotia Cooperation Agreement for Forestry Development (CAFD) has established a standing committee to advise on the implementation of our current agreement.

What makes this significant is that it is the first time that the federal government has provided a formal vehicle through which the presidents of this group venture, as well as consulting foresters and silviculture contractors associations, can meet on a frequent basis with the main Federal and Provincial CAFD implementation personnel.

The mandate of this committee is to provide advice on the following areas: Treatment Criteria, Environmental Criteria, Cost Formulas, Inspection Methodology, Documentation and Information.

Although originally expected to meet a minimum of three times per year, it has already met eight times in the first half year. Meeting notes show that a lot of innovative ideas from the field level are being brought to the table and that they are being responded to in constructive and positive ways. ❖

Committed to new directions or committeed into "voodoo silviculture"?

by John Lawrence, Brinkman & Associates Ontario Manager

Thinning/Tending Program

Despite the Ministry of Natural Resources' promise to re-direct funding into thinning and tending up to 12,000 hectares in 1993, only less than 1,000 hectares were actually treated. In an effort to make good on its commitment, the MNR offered a last-minute thinning course in Atikokan, at the end of October, with a trainer flown in from Nordfor of Sweden. Initially, the course was to include only one contractor's representative. But with less than a week to go before the course, the MNR advised the Ontario Silviculture Contractors' Association to send six representatives. In the middle of viewing season and with no evidence of a program in place, only two contractors were able to attend.

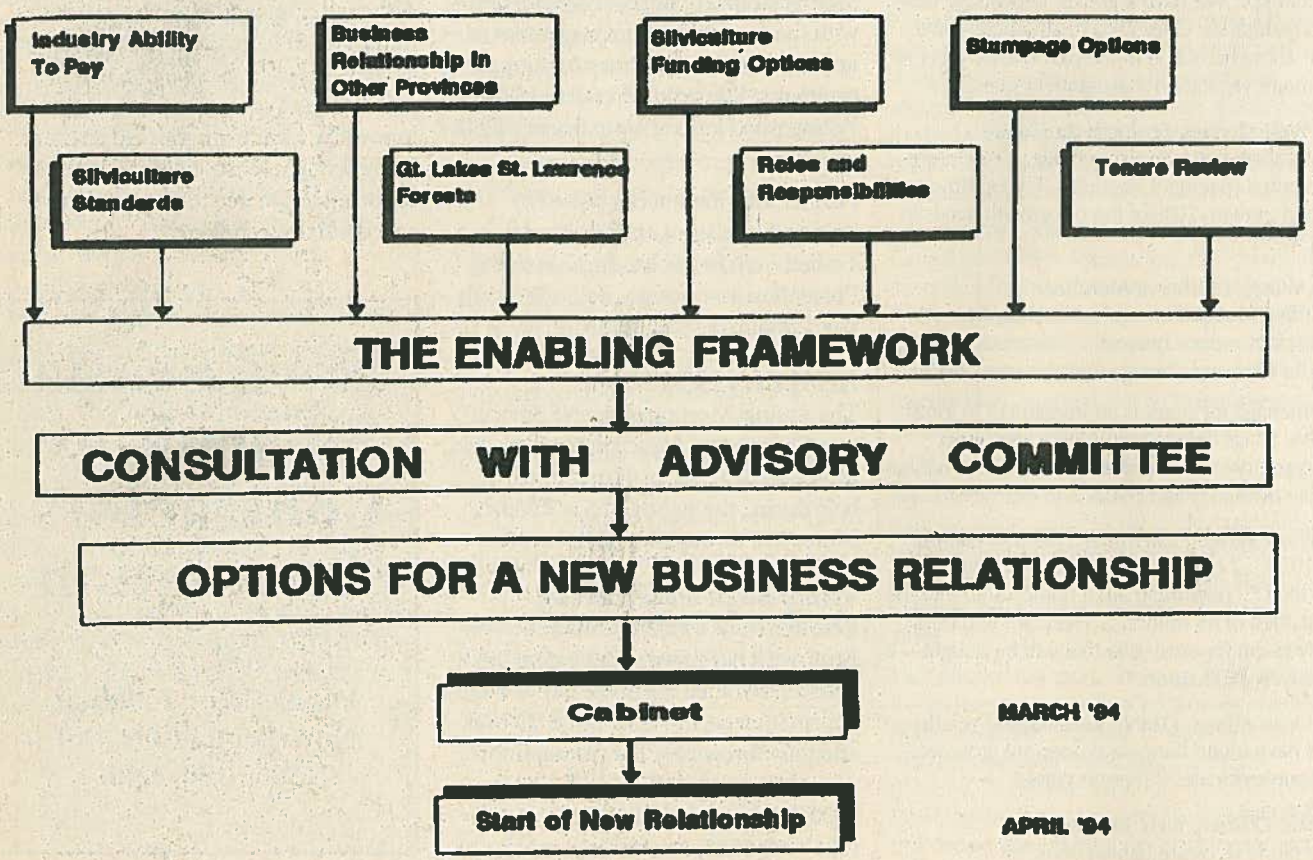
What was that new committee supposed to do?

As indicated in the last issue, a new Provincial Facilitator has been appointed to work out a new forest-management business relationship between industry and the Ontario government. Despite several other incomplete initiatives, notably the Forest Values Project, the Timber Production Policy Project, the Diversity Report and the Class Environmental Assessment of Timber Management, it appears that the Provincial Facilitator is where some key decisions affecting silviculture will be made in the near future. The accompanying flow chart shows the various factors being considered in terms of funding of forest management, and specifically, silviculture.

Clearly, the two committees dealing with funding options and silviculture standards are vital to the survival of the silviculture industry in Ontario. Without definite performance-related standards for silviculture that realistically address the principle of sustainable forestry, then the voodoo notion of "other low-cost methods" will sweep Ontario and decimate our industry. As well, without adequate mechanisms to ensure that funding is available, the uncertainty which currently plagues us will remain.

Forest renewal on Crown units: growing backlog

The damage being done by the current lack of government direction and commitment in Ontario is most noticeable in the Crown Management Units. The Crown Units have been, and



continue to be, seriously neglected. By contrast, the FMAs have more than fulfilled their obligations, with secure provincial funding and innovative pre- and post-harvest treatments.

Only those well acquainted with the Crown areas are aware of the gravity of the situation due to the government's steadfast refusal to allow independent auditing of its management units, as is the practice with the FMAs. Even a cursory view of the numbers involved in the Crown planting program, between 1988 and 1993, shows the seriousness of the situation (see chart). In 1989/90, the MNR's own numbers indicated a 300,000 hectare backlog. The cynical in the industry, who watched the government's incredible misrepresentation of the Regeneration Audit Report, expect to hear soon how these areas have miraculously stocked themselves!

The accompanying chart also illustrates the degree to which recent policies have affected the silviculture industry. With prices at or below the levels of ten years earlier, the infrastructure necessary to perform the work that needs to be done (despite government rhetoric to the contrary) is fast disappearing. ❖

Ontario Silviculture Directions

Note: This is an edited version of the background paper circulated by OMNR explaining the new silviculture direction.

During the 1980s, the silviculture budgets more than doubled, peaking at $140 million in 1989. Constraints on the silviculture budget over the last two years have, however, impaired the province's ability to plant the traditional level of 160 million level of seedlings, while performing other essential silviculture activities, such as lower cost regeneration, and stand tending.

The proportion of the silviculture program budget spent on planting trees has increased, while the funds supporting other activities have decreased.

By 1992, it was obvious if the trends continued that a disproportionate amount of the silviculture budget would be devoted to planting on an increasingly smaller portion of the harvest area.

Early in 1992, the Minister of Natural Resources requested that a strategy be developed to address the issues of: i) the Direction 90's announcement that indicated the Ministry's mandate to maintain ecosystems and secure forests for future generation; and ii) the silviculture budget that was reduced by $30 million in 1992, with further reductions anticipated for 1993.

The complexity of deriving a strategy that would satisfactorily address both of these issues was further accentuated with the release of the preliminary results of the Ontario Independent Forest Audit. The Audit confirmed that not enough effort was made in tending the regeneration. The results showed a marked increase in the amount of hardwood species and a substantial decrease in the conifer component. It is apparent that control of undesirable vegetation and competing tree species in both treated and untreated stands will be necessary if management objectives are to be attained.

The objective of regenerating all areas harvested, combined with the fiscal realities, require changes to the traditional silviculture program.

The provincial silviculture directions are not intended to provide specific targets but overall direction for the silviculture program. Over the next several years, to most effectively manage the forest given the financial environment, MNR will decrease its reliance on tree planting and increase its use of lower cost regeneration methods and tending activities based on sound forestry science.

While these are provincial trends, local needs must be addressed. Local managers must ensure that the most cost-effective, viable silvicultural prescriptions are implemented on all sites. ❖

YEAR	CONTRACTORS	TREES (MM)	$ MM
1988	94	84.4	10.0
1989	78	80.5	9.4
1990	71	80.1	8.7
1991	66	48.6	7.7
1992	51	25.9	3.7
1993	29	23.1	3.1

QUALITY						
	1988	1989	1990	1991	1992	1993
Provincial	92.6	93.8	95.3	95.1	94.5	93.1

1989–90 Quality based on comparison of contract vs. actual unit costs
1991–93 Actual quality weighted from plots.

UNIT COST PER K						
	1988	1989	1990	1991	1992	1993
Provincial	155	166	174	164	143	133

Western Silvicultural Contractors' Association

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WSCA Executive

WSCA Southern Interior Report

Kent Mjolsness, WSCA Southern Regional Coordinator

Among the more prominent issues of the year in the Kootenay and Boundary regions, as you may know from previous submissions to *Canadian Siliviculture Magazine*, are the new Commission on Resources and Environment (CORE) and its prospects for a successful completion; plus, the ongoing classic — the tendering, awarding and administration of silviculture contracts.

First, "hats off" to the present provincial government for having the foresight and courage to initiate and support CORE. With the presence of the Free Trade Agreement, NAFTA and GATT, it may be one of the last opportunities for decisive input on the direction of use and control of regional resources. Some say it may be too late already, but who wants to believe that?

Recently the Commissioner, Stephen Owen, and the BC Cabinet have indicated a willingness to extend the deadline for completion to March 31, 1994 for both the East and West Kootenay Tables.

The Kootenay Tables are presently working on sector maps, indicating their priorities for land use designation, boundaries and protected areas strategies (PAS), significant policy issues within each sector, and transition strategies to accommodate possible job loss and economic alternatives resulting from CORE decisions.

An impressive level of communication and cooperation has evolved at the East Table to date, though several meetings were necessary to establish adequate levels of familiarity and trust. The "consensus" process is not established easily. As a spokesperson for Fish and Wildlife aptly stated at a meeting early in the year, "It's time to stop all this strutting, fluffing of feathers and pissing on posts and get on with it." I would say that this has definitely taken place, but the crucial issues of land use designation and resource management will be first on the agenda in the new year. The mood is very optimistic but cautious.

Other issues in the South continue to centre around the tendering, awarding, and administration of silviculture contracts. Several contracts, with both Forest Service and Appraisal, were awarded to very low bidders and met with serious problems. Some of these problems justified cancellation of the contracts, but "eyes were averted" and "adjustments" were made to "tolerate" the work done until the conclusion of the contract. I'm sure this phenomena is not unfamiliar to many Forest Districts in the province. Perhaps the Forest Practices Code should address the appraisal of performance and quality within silvicultural applications as well. Independent, knowledgeable adjudicators, having sufficient field experience at all levels of the industry, would be essential to these positions.

On a more positive note, I want to commend the Kootenay Lake Forest District and their Implementation Contractors for addressing some of the contractual issues mentioned above and would encourage them to continue further. Considering the time and effort given, the financial compensation and the upper-level limitations, the technical and office staff do a very commendable job.

Within the fall viewing of most contracts for 1994 in the above district, the legitimacy and credibility of contracts appears to be given more consideration. However, despite very favourable lumber prices, the bids for silviculture contracts remain low. Consequently, it looks like another very lean year for silviculture in Southern BC.

RFPs: Weighty Matters

Marc Hobday, WSCA Director

Note: Letter to Diana Lucas, Technical and Administrative Services Branch, BC Ministry of Forests, August 31.

At present, the Ministry of Forests Silviculture Branch is using a Request for Proposal (RFP) system which is unacceptable to the members of the WSCA. This letter presents five issues that must be addressed.

1. The assigned weights of the evaluation criteria are not being included in the RFP packages.

2. These weights are often being altered after the closing date.

3. Several districts are inappropriately using the RFP process in place of an Invitation to Tender.

4. Bid prices should be submitted in a separate envelope and not opened until all proposals have been graded.

5. Under no circumstance should proposals be disclosed.

Assigned weights of the evaluation criteria must be included within the RFP package. This enables contractors to prepare an appropriate proposal and ensures that equal information is provided to all parties. On February 4th, 1993, your department issued a policy directive to all districts and regions which addressed contract administration under the new Freedom of Information and Protection of Privacy Legislation (Bill 50). Amongst other points, you indicated that "RFP packages shall contain a list or spreadsheet of the evaluation criteria being used to establish the best-valued proposal. The evaluation points or a point range should be included." We support your office for addressing this issue; however, specific evaluation points are required within the RFP package because a point range is not adequate.

Several districts are altering their predetermined RFP weighting scale when there is a large cost discrepancy between the top ranked proposals. The Ministry's justification for this decision is their responsibility to the people of BC to obtain the best value for the dollar, but is this not the purpose of the RFP? Evaluation weights reflect the priorities of a project. Changing these after the fact turns an objective model, that measures value for the dollar, into an arbitrary process. The Ministry must decide on its method of tender and stand by it.

Several districts are using RFPs with a price weighting that far outweighs all other criteria. When cost is the most sensitive element, an invitation to tender with specific qualifications should be used rather than an RFP. To quantify this, we recommend that RFPs only be used when the price component is 40 percent or less.

Your policy directive indicated that, after the evaluation process, proposals shall be disclosed if requested by a proponent, subject to the following exceptions:

- s.21, "Disclosure harmful to business interests of a third party" (e.g., trade secrets or confidential information contained in a vendor's proposal);

- s. 22, "Disclosure harmful to personal privacy" (e.g., resumé information, character references or information describing the vendor's financial situation).

Proposals in their entirety represent confidential information about the vendor's business and they should not be disclosed under any circumstances. Prices, however, should be released.

Bid prices should be submitted in a sealed envelope and not opened until all proposals have been graded. This would eliminate any potential bias towards price without altering the process. This is important to contractors.

The WSCA supports the Request for Proposal system as an excellent means for the Ministry to receive a competitively priced, quality product; however, an objective system must be upheld. We request that your department address the above concerns and issue a second directive to all regions and districts.

MOF responds to RFP concerns

Diana Lucas, Contract Administration Analyst, MOF

Note: Letter to Marc Hobday, WSCA Director, October 8.

Thank you for your recent letter outlining concerns the WSCA has relative to the Request for Proposal (RFP) process, one of the methods of contract competition used by the Ministry.

I have shared your letter with the Silviculture Branch and would like to respond to each of your five concerns in the order presented:

1. Weights of the evaluation criteria not being included in the RFP packages

As you know, our office addressed this issue earlier this year by way of a ministry-wide Contract Administration Directive. Since this may be a new concept to some staff, you may be finding that this isn't being done 100 percent (it is a change from some former beliefs that such information should remain confidential). Keep in mind contractors have the right to request such information, if they want it.

The new Freedom of Information (FOI) legislation is one reason why the Ministry must now ensure evaluation criteria is included in the RFP package. So, to aid in the changeover of ideas, we included a minimum requirement which is the disclosure of a "point range". However, I agree that the specific evaluation points should ultimately be shown.

Action: In order to ensure this procedure will be followed, we will send out an electronic bulletin board item to all Ministry staff reminding them of the requirement to indicate the specific evaluation criteria and points within the RFP package.

Our electronic contract administration bulletin board (called BBCAHELP) is now the fastest and most effective method of sending information ministry-wide. It is also one of the most widely read boards on the Ministry mainframe system.

2. Weights are being altered after the closing date

I realize you are indirectly referencing the Cassiar Forest District multi-year, multi-phase RFP decision of earlier this year, which was a regional decision. Note, the Contract Administration Manual, Chapter 4, page 18 allows that, if the highest rated proposal's price is too high and/or above budget, the Ministry can "negotiate reduction of work and price if other proposals are not suitable. [Or] reject the [highest-rated] proposal if another suitable proposal of acceptable standards was received."

However, altering weights after they have been set is not an acceptable practice — it is not permitted by any policy or procedure within the Ministry.

Action: We will commit to following up on this by reminding all Ministry staff, by electronic bulletin board, that altering the weightings after the closing is not acceptable.

3. Use of the RFP process in place of the Invitation to Tender (ITT)

Once again, the Ministry does not have any policy or procedures existing that direct districts to make the pricing component outweigh all other criteria. It is agreed that if cost is the most important factor, then the project should be let by ITT, with the conditions of tender firmed up to incorporate eligibility requirements. We agree that 40 percent or less is an appropriate weighting for the pricing component of an RFP. The sample weighting shown on our Contract Proposal Evaluation Form is 24 percent.

For your information, we issued a major Contract Administration Policy Directive in July 1992, defining ITT, RFP and ITQ, and detailing what situations they are most appropriate to. It is clearly stated that with the RFP process "cost is not the prevailing, nor the only, [contract] award criterion." All district offices are well aware of this Policy Directive.

Often, the RFP process is useful for new contracting strategies where performance is utmost; however, after one or more years of Ministry/contractor community experience, the same type of project could be let by ITT, since performance and innovation has been proven and can be specified, such that price becomes the bigger consideration.

Also, the Silviculture Branch is considering a proposal for a renewed Contractor Performance Rating System attached to the Integrated Silviculture Information System (ISIS). Such a system would greatly reduce district's use of RFPs since contractors on the system would be pre-qualified as to their performance and capability level, etc. This system could also create a more level playing field in the contracting community that would be to the benefit of all parties.

Action: The Silviculture Branch and Technical and Administrative Services Branch will endeavour to encourage the appropriate use of ITTs and RFPs. The recommendation that the proposal price component should be no more than 40 percent of the total evaluation weight, will be included in the bulletin board notice previously stated.

4. Bid prices should be submitted in a separate envelope

Logically, the price should be the last criterion rated, as we have shown on our Contract Proposal Evaluation form used ministry-wide. The two-envelope system is a good idea that we are aware other ministries are using, such as Transportation and Highways.

Action: We will look further into this concept with the possibility of incorporating a two-envelope system into future Ministry RFP procedures.

5. Under no circumstance should proposals be disclosed

The Freedom of Information and Protection of Privacy Act (FOIPOP) is exclusive, rather than inclusive; therefore, ministries must release everything except for a number of exceptions (i.e., specified under Sections 13, 17, 21 and 22 of the Act).

While the Act will not permit us to entirely exclude proposals from release consideration, please be reassured the FOIPOP will protect against the release of personal and confidential business information, as stated in the Contract Administration Directive on FOIPOP of which you have a copy. This would come down to very little, if anything, being released if it were ever requested.

Action: We appreciate your concern and will pass it on to our Ministry's Freedom of Information Section for further consideration.

We appreciate being informed of particular contracting occurrences that concern the WSCA. Please continue to advise us of any of your contracting concerns. ❖

Private land needs silviculture regulations

Dirk Brinkman, President WSCA

Note: This letter was sent to former Minister of Forests, Dan Miller

Is the extent of private land harvesting being tracked by the Ministry of Forests and to what extent is any silviculture presently being done? It appears to WSCA members that very little private land is reforested or harvested carefully.

The WSCA requests that your government brings in legislation requiring all harvesting on private land be subject to silviculture regulations governing harvesting on public land.

Degradation of private forest land is an embarassment to the British Columbia forest industry. This lack of reforestation and site degradation undermines BC's consumer and voter credibility.

We believe that, as with crown land, the consumer should pay for the maintenance of forest productivity and that the value of the harvest can support these additional costs for a landowner.

NSR reclassification not a threat to BC's forests

Henry J. Benskin, Director, Silviculture Branch

Note: Letter to the Editor, Canadian Silviculture Magazine, *November 3.*

The Ministry of Forests would like to respond to your article, "Reclassifying pre-'82 NSR threatens BC's silviculture standards," in the Fall 1993 issue of *Canadian Silviculture Magazine.*

In a letter dated July 21, 1993, to the former Minister of Forests, Dan Miller, Dirk Brinkman states that "Declaring the pre-1987 understocked areas as stocked (SR), implies a double standard and invites compromise of BC's Silviculture Standards in other areas." The Ministry of Forests agrees with this statement and is dedicated to achieving full stocking on NSR lands that have been harvested or disturbed between 1982 and 1987.

The silviculture policy of the Ministry of Forests regarding reduction in minimum stocking standards applies to pre-1982 NSR areas, not to pre-1987 NSR areas, as represented by Dirk Brinkman. Specifically, the silviculture policy states:

Silviculture policy regarding minimum stocking standards for pre-1982 Good and Medium NSR sites will be amended as follows:

Stands are considered SR/Free Growing where the average age of well-spaced, healthy, and vigourous. free-growing stems is twelve years or greater and the number of well-spaced, healthy and vigourous, free-growing stems is 60 percent or more of the existing minimums (as per Ministry of Forests Correlated Guidelines of Free Growing Stocking Standards, 1990).

As President of the WSCA, Dirk Brinkman should be aware of the impracticality of planting smaller seedlings among fully established larger trees that almost completely occupy the existing growing space.

This very same concern was pointed out to the Ministry of Forests by one of the WSCA members during the first Forest Resource Development Agreement (FRDA I), who pointed out that money and seedlings were being wasted by planting these marginally fully stocked areas.

As a result of this concern, Ministry of Forests field staff have taken a more critical look at areas that have been scheduled for planting and deferred those areas that were close to full stocking. The silviculture policy to reduce the stocking standards on pre-1982 NSR areas puts this practice into writing and provides for associated volume reductions.

Since there was no intent to plant these areas, there will be no impact on the number of seedlings the WSCA members will plant.

The impact on the annual allowable cut (AAC) is a positive one, since at present, these areas are not included in the determination of the AAC. These areas will now contribute to the AAC but at a lower level than a fully stocked area.

The government has the responsibility to all citizens to make cost-effective decisions on resource management. The decision not to treat those areas that are close to the required stocking levels is a sound one given the complexity and expense of further treatments. ❖

NSR decision a dangerous precedent

Dirk Brinkman, President WSCA

Note: This letter was sent to Henry Benskin, Director, Silviculture Branch, Dec. 23, 1993

On behalf of the members of the WSCA, I again request that the Minister and his policy staff in Victoria rethink their decision to arbitrarily reduce the minimum stocking standards for all pre-82 NSR.

Thank you for taking the time to respond to the article in the last issue of CSM: *"Reclassifying pre-'82 NSR threatens BC's silviculture standards".*

It is indeed the governments responsibility to make cost-effective decisions on resource management. This requires that the forest is promptly and fully restocked after the economically motivated disturbance of harvesting, so that the main resource fueling BC's economy is optimized.

That "there was no intention to plant these areas" and that "the silviculture policy to reduce the stocking standards on pre-1982 NSR areas puts this practice into writing" is the issue of fundamental concern to our members.

I was the WSCA member that pointed out FRDA money was being wasted on some of the pre '82 marginally stocked sites, and my appeal on this matter is being misrepresented. My concern was with the then current practice of site preparing marginally stocked sites, destroying existing stocking, in order to start over with an even aged plantation. It was my recommendation that the prescription take advantage of the existing stocking (which is often free growing) and that the sites be fill planted until Sufficiently Restocked.

You claim that "as President of the WSCA," I should be aware of the impracticality of fill planting smaller seedlings among larger trees. Quite the opposite is true. Many of our members' crews, including our own, have for years effectively fill planted among larger trees— both in select logging and re-hab areas. In those cases we space from the 'drip line' of the larger trees.

Spacing from the drip line approximates the adjustment which reflects the lower densities appropriate for more mature components of the stand.

This provides the practical solution of graduating to lower minimum stocking densities for larger trees in the stand. For example, appropriate minimum stocking standards for 24 year old components of a site, (assuming that some existing 12 year old stocking is augmented with additional seedlings that will reach free growing over the next 12+ years), would be lower than MOF's Correlated Guidelines of Free Growing Stocking Standards.

Rather than a blanket reduction of the minimum stocking standards simply because it is "cost-effective", graduating the standard to reflect these older components would be good silviculture. In that case, some marginally under stocked sites might be soundly classified as SR. The other sites can be economically fill-planted.

The only impracticality is the complexity of over-coming a Victorian block to uneven aged forest practices. Mixed age stands preserve habitat values while optimizing the inventory. Fill planting among established stocking ensures a good species and age mix.

We appreciate that the Branch echoes the WSCA's concern with the risk of compromising the Silviculture Regulations.

Temper fugit. In 1994, *all* pre '82 areas are 12+ years. Each year thereafter the 1982-87 sites begin to come of age. District Manager temptation to reclassify 1982-87 sites will build as the years pass. In 1999, sites harvested after Oct. 1, 1987, under the new Silviculture Regulations will also reach age twelve. 1993's decision by MOF gives the 1999 Forest Industry a moral argument to demand MOF classify sites over 60% stocked as free growing SR, based on the MOF's own practices.

It is commendable that the government is committed to restocking all NSR areas by the year 2000. The WSCA also recognizes the pressure that MOF is under to find positive inventory to contribute to the rapidly shrinking AAC. Achieving these goals by reclassifying NSR areas as SR fails to protect the trust that the public puts in foresters.

We look forward to continuing to work constructively with the Ministry of Forests on silviculture policy issues.❖

Forest Amendment Act

Andrew Petter, BC Minister of Forests

Note: Letter to Dirk Brinkman, WSCA President, October 28 in response to a letter published in the last issue of CSM.

Thank you for your letter to the former Minister of Forests concerning the Forest Amendment Act (No 2), 1993. I appreciate receiving your views and I apologize for the delay in this response.

The intent of the silviculture changes is simply to clarify the legislation so that it reflects the government's established silviculture policy and good field practices. Without these amendments, the Forest Service would have difficulties in ensuring that licensees fulfil their obligations.

The provisions that allow the District Manager to exempt the Crown or a licensee from carrying out basic silviculture are limited to very specific circumstances and are related to situations where such work is not needed or appropriate. For example, I am sure that you would agree that it makes little sense to require someone to plant the middle of a permanent forest road. The use of these powers will be closely monitored to ensure that they are used in a responsible manner and further restrictions may be applied through Order in Council.

I share your concerns regarding loss of productive forest land. Ministry staff estimate that between two and eleven percent of productive forest land in each timber supply area will be used for roads, landings and skid trails. Other losses will likely occur due to the creation of new protected areas and the use of forest land for non-forestry purposes, although the magnitude of these changes is difficult to predict.

I do not feel that a no-net-loss policy should be tied to the recent legislative changes, which are required to ensure that existing silviculture policy can be enforced. Rather, it must be examined in the broad context of society's overall needs, the costs and benefits of such a policy and the government's financial situation.

You may be aware that the government recently established the Forest Sector Strategy Advisory Group, which will give government and forest stakeholders an opportunity to cooperate in developing an industrial strategy for the forest sector. This group may examine options for ensuring stability of the working forest, including the option of a no-net-loss policy. As well, the Forest Practices Code, which is currently being developed by the Ministry of Forests, may regulate the amount of forest land that can be used for roads, landings and skid trails, and thereby help to minimize losses of productive forest land. ❖

Status of WCB camp regulations

Enforcement questions arise

Dirk Brinkman, Joan Thomas and Bill Williams, Employer Representatives for the Silviculture Subcommittee

Note: Letter to James E. Dorsey, Chair of the Governors, BC Workers' Compensation Board, November 2.

The Recommendations for Camp Regulations proposed by the RAC Working Group on General Conditions (RACWGGC) raise grave concerns for the Employer Representatives of the Silviculture Subcommittee.

Mainly, the report of the RACWGGC states:

"The Working Group does not see a practical way to require an employer to supply a camp. Legal advice is that a legislative change to the Workers' Compensation Act would be necessary, and then the ensuing regulations would probably activate only if a clear health or safety hazard to workers would exist if no camp was provided. The proposed regulations would set the standard for a camp, if one is provided."

When the Silviculture Subcommittee was formed, it was given a mandate to develop proposed regulations for accommodations, sanitary and safety conditions in and around temporary silviculture camps, not long-term industrial camps. In addition, the consensus document was "negotiated" and produced in the belief that universal enforcement of the proposed regulations contained in it would be mandated through changes in legislation and negotiations with the Ministry of Health.

As Employer Representatives of the Silviculture Subcommittee of the WCB, we agreed, through negotiation, to more vigorous standards enforced by a more stringent agency, only in exchange for uniform provision and enforcement of the regulations ("Scope" and "Notice of Project") on the silviculture industry.

If the employer representatives had been informed of the very slim possibility of providing for uniform enforcement, the consensus document you now have would probably be a very different document.

We believe the fast-tracking process that was used to move the Subcommittee along to completion of a consensus document was flawed. Insufficient time was taken by the Secretariat for Regulation Review of the WCB Board of Governors to review and discuss with the Ministries of Forests and Health the intent for uniform regulation for silviculture temporary camps; moreover, the regulatory context of the inter-jurisdictional problems were inadequately reconciled. Also, prior to setting the terms of reference for the Silviculture Subcommittee, legal advice was not sought on the implications of uniform enforcement by WCB, nor was the RAC Working Group consulted on their views of mandatory requirement for standards of accommodations and meals.

Furthermore, the RACWGGC has reworded the Regulatory Proposals of the Silviculture Subcommittee with a view to apply them to all work place camps, whether they be permanent or temporary. These changes were made with no prior consultation with the Silviculture Subcommittee.

It must be understood that the isolated and very mobile nature of the Silviculture Industry is unique and the Regulatory Proposals developed by the Silviculture Subcommittee are balanced to reflect the working conditions of this industry. Applying these unique Regulatory Proposals to other industries in British Columbia appears to give rise to many problems.

The chair of the RACWGGC advised us on October 28 that there is a very strong possibility that, due to these problems, such an authority for WCB would never be recommended by RAC. We believe it is very late in the process to be informing the Silviculture Subcommittee of such a drastic change to the assumptions used during their negotiations — after the fact!

It would appear now that the WCB does not have the legal authority to compel a silviculture contractor (or anyone else) to provide safe and healthy services. The goal of providing workers with safe and healthy camp conditions and a level playing field for the industry is gone. Instead, we are faced with the possibility of higher standards, more regulations and stricter enforcement for those contractors who choose to supply camps and no regulations for those who choose not to supply camps.

At this point in time, we strongly oppose the use of this document by the RAC Working Group as a consensus agreement to further the adoption of any regulations that will only be used to regulate those employers who choose to provide camps.

We also believe that, instead of improving the conditions of workers' health and safety in silviculture camps, the proposed change from the enforcement of basic camp conditions by the Ministry of Forests, Ministry of Health and Forest Industry to enforcement of camp regulations by WCB will effectively negate all temporary camp improvements that have been developed to date. All considered, if contractors are not required to provide safe and healthy services under regulations, the Silviculture Industry and its workers are far better off staying with the status quo.

If it is confirmed that we have drafted proposed regulations that only apply to those employers who choose to provide camps, we will not only withdraw our support of the consensus document, we will be compelled to vigorously oppose the adoption of these regulations in every way. ❖

WCB chair responds

James E. Dorsey, Chair, Board of Governors, BC Workers' Compensation Board

Note: Letter to Dirk Brinkman, Brinkman and Associates Reforestation Limited, December 15

Thank you for your letter of November 2 and your expression of concern with respect to the development of regulations related to silviculture camps.

I have, as a consequence, taken the time to review the terms of reference of the Silviculture Subcommittee which mandated the deliberations of yourselves and the worker representatives of the Subcommittee.

In particular, the terms of reference of the Subcommittee required it to address the issue of notices of project for silviculture work and "accommodations, sanitary conditions and facilities for silviculture work."

The mandate did not specifically include the consideration of a regulatory requirement for the provision of a camp by employers in the silviculture industry. Certainly the Subcommittee would have been entitled to take cognizance of such a requirement and it would have been appropriate for the Subcommittee to have made a recommendation with respect to the need for a regulatory requirement to direct employers to provide such facilities.

I note that the Final Report of the Silviculture Subcommittee contained no discussion of the issue of a regulatory requirement for the provision of a camp. It is my understanding that the issue of a regulatory requirement for the provision of a camp came to the fore as a result of a discussion of the Working Group on General Conditions, who embarked upon a review of regulatory requirements for accommodations in other industrial sectors.

I do want to assure you that the Regulation Advisory Committee, the Governors' Committee for Regulation Review and myself are working to ensure, to the extent possible, that the Board does develop regulations that are of as universal application as possible, and that they respect the consensus agreements of the Silviculture Subcommittee. In addition, the Secretariat is researching various mechanisms to help address the concerns you have raised.

I have, on the instructions of the Governors, met with officials of the Ministry of Health. We are not in the process of coming to a formal agreement with this ministry, with respect to the joint development of regulations to be enacted under the Health Act, based upon the Silviculture Subcommittee's proposals.

The Silviculture Subcommittee will be consulted further as the development of these regulations proceeds.

The issue of a statutory mandate of camps has not, regretfully, yet been resolved. However, our efforts will be directed to the resolution of this issue, through statutory amendment if necessary and possible. ❖

Uniform enforcement important

Dirk Brinkman, WSCA President

Note: Letter to James E. Dorsey, Chair of the Governors, BC Workers' Compensation Board, Jan. 5, 1994.

Thank you for your letter of assurance.

Please be advised that between the Silviculture Subcommittee meetings and the publication of your report a critical element of our committee's recommendations was lost: namely the importance of uniform enforcement. In fact, the scope of these regulations was discussed at virtually every meeting and both employee and employer representatives were strongly united on the issue of uniform enforcement.

It did cause us some confusion that the WCB advisor to the Subcommittee would occasionally raise the question of the legal grounds or the mandate to enforce these kinds of health standards on everyone, and the answer that, in their wisdom, the Board must have decided that such power would be legislated. We made our recommendation on this assumption.

I attach a May 1993 draft of the Subcommittee's recommendations that shows one approach of the Subcommittee to the question of scope. Somehow the text on uniformity that the Subcommittee agreed to was not included in the final report.

I trust that the Board of Governors will ensure a just enforcement of these health and safety standards to protect all employees, not just those of contractors that voluntarily provide camps. ❖

Silviculture Camp Regulation Scope

The employer shall ensure that accommodation and services are provided for a crew/workforce with a sum total of seven or more employees (no splitting) which meets the minimum requirements stated herein.

This regulation applies to the establishment and operation of temporary workplace camps or equivalent facilities use by workers.

Responsibilities

"Licencee" means the person who have been granted rights to harvest, plant and care for Crown timber under the Forest Act known as the holder of a "license to cut" or ther holder of a "major license."

"Owner" includes the Crown in the right of the Province.

"Camp" means land or premises on which there are cabins, tents, trailers, dwellings or other structure used as a temporary living quarters for silviculture workers.

Forests minister responds to BC21 criticisms

Dan Miller, Former BC Minister of Forests

Note: Letter to Dirk Brinkman, September 13 in response to a letter published in the last issue of Canadian Silviculture Magazine.

After receiving a copy of your letter to Chief John Smith, I am compelled to respond to your inaccuracies and misconceptions about the Ministry of Forest's new Forest Worker Development Program (FWDP or "BC 21").

The program was designed as a progressive next step following the ministry's 50 years of experience in providing productive work for unemployed people. The program is intended to increase the skill level of workers in the industry, as well as provide an entry point and source of trained workers for locally based contractors. BC 21 and the Ministry of Social Services have cooperated with the Ministry of Forests by supporting and funding the initiative.

There were no contracts cancelled as a result of FWDP contracts being initiated. Some projects, which would have previously advertised provincially, were advertised locally. In a few districts, this has affected who was awarded work and subsequently who was hired. Overall, however, the total amount of work available to forest workers and contractors this year has increased.

The part of the program which focuses on training income assistance recipients has not accelerated from $12 million to $56 million as you state. The training component of FWDP uses only $4 million of silviculture funding, combined with an additional $12.9 million from the Ministry of Social Services, to cover the cost of training. This is exactly the kind of cost sharing you advocate further on in your letter. Workers are paid on an hourly basis only for this training component of the program. You use the same practice in your own training program when you pay beginners by the hour until their proficiency is sufficient for piece work.

The majority of funds designated for silviculture ($22.6 million under FWDP and $8.2 million under SBFEP), are used to fund work done in the traditional manner, often by WSCA members. These contracts are on a piece work basis and there is no requirement to employ income assistance recipients. The only change is a stronger focus on local contractors using local workers, and an opportunity to train workers in advanced or new techniques.

Your concerns regarding quality and cost efficiency are unfounded. Under all levels of the program, Ministry of Forests' standards for work quality must be met before payment is made. Appropriate production targets are set under each training level, and any inefficiency during training is funded by the Ministry of Social Services. This results in very high cost-efficiency to British Columbia tax payers, since the goals of both ministries are met at a lower overall cost to the province.

This is not a make-work program. The areas treated under the FWDP have the same level of forest management priority as those treated with regular program funding. The objective is not to simply transfer income assistance recipients to UIC. Workers who are proficient in the entry program have an opportunity to continue with more advanced training under the bridging program. We expect that workers who reach full production level by the end of the 20-week bridging program will transfer successfully to the silviculture industry.

I agree with your comments on the importance of pre-selecting potential workers for training. Under the FWDP, potential workers are screened carefully. First, social assistance recipients must show interest by applying. Second, they are screened by Ministry of Social Services staff for suitability and motivation. Third, the contractors choose who they will hire, including the 25 percent of the workers who are not on income assistance. It is further expected that the entry level will be used to select workers capable of the higher production required at the bridging and contracting levels.

Aboriginals on provincial income assistance are eligible for both training levels of FWDP. In addition, the First Nations Direct Award silviculture contracting initiative is being continued under the contracting level. The purpose of this program is still "to provide reasonable opportunity for a contractor to develop the expertise required to compete as an equal member of the silviculture contracting community. Direct awards are phased out after a few projects or as soon as the contractor has gained sufficient expertise to be competitive." The Ministry of Forests maintains its commitment to aboriginal involvement in forest management through the First Nations Forestry Council.

The Ministry of Forests also maintains its commitment to the silviculture contracting community. The Forest Worker Development Program is a positive move in the right direction, providing significant benefits and opportunities for forest workers and silviculture contractors, as well as traditionally disadvantaged groups. ❖

Creston committee airs FDWP concerns

Creston Public Advisory Committee: Sharon Willicome, Chair, and Kent Mjolsness, Silviculture Representative

Note: Letter to Corky Evans, MLA, Nelson-Creston Riding

Following the Creston Public Advisory Committee meeting on December 9, 1993, our membership felt that the following issues should be addressed with your office.

Specifically expressed were concerns pertaining to the Forest Worker Development Program (FDWP) and its application to First Nations and the training of future silviculture workers.

Under the current guidelines for qualification for the program, First Nations people on reserve are excluded as they are covered by Federal social assistance rather than Provincial. The criteria for qualification, as presented in the literature provided by the Ministry of Forests, indicates this training is available for members of aboriginal communities and in rural communities suffering from economic recession.

Locally, no request to the Band was made for names of people who may have been living outside of the reserve and may have an interest in training.

The need for such silviculture training of First Nations people could be utilized after completion of land claims settlements and the potential for future forest management applications.

Our second concern pertains to local silviculture contractors within the Kootenay Lake Forest District and the allocation of funds, coming from the silviculture budget, being applied for training as opposed to actual silviculture application.

As well are concerns for the process of candidate selection for the program, specifically:

- Appropriateness of candidates to employment
- Long-tern employability and financial return on training
- Perceived ability of candidate - physical abilities to handle job and career interest

The current selection process is lacking in determination of appropriateness of candidates and their commitment to the field of training. Is training for Ministry of Social Services recipients optional or a compulsory/mandatory requirement by the Ministry?

What is the benefit of training employees, specifically in the local area where there currently exist an abundance of trained silviculture workers, but inadequate budget for silviculture applications?

The issue of availability for First Nations training programs should perhaps be addressed and possibly considered through alternative applications for funding. The capabilities and further employability of trainees through the Ministry of Social Services should be reconsidered. ❖

Revamp WSCA FWDP policy

C.O. Emery, President, Firewest Forest Management

Note: Letter to the Editor, January 9.

WSCA, through its President, has been very strongly opposing the method of funding for the Forestry Worker Development Program (FWDP), which was the 1993 version of FFP and its predecessor, FWAP.

There are a number of points relative to training via the FWDP to bring to the attention of our members and others, now that we have concluded the season and are busy planning for 1994.

1. The 1993 FWDP budget came from the same source as FFP or FWAP used to. It was a 25 percent MOF budget instead of the previous 50 percent, which supposedly freed up some MOF money for other purposes, hopefully silviculture. The balance came from Social Services.

2. The impact has been that it is a separate budget item from "normal" MOF work for the contract, but MOF's own administration costs always have come out of their general silviculture administration budget.

3. The contractor (sponsor) was free to select participants from anywhere. We did our own hiring and firing. There had to be a minimum of 75 percent participants that were IARs (income assistance recipients). The rest could be on UI or just simply our of work, or even quit a job to take the training. The IAR prospects were obtained from any source; however, in consultation with Social Services, they recommended a string of IARs for our interviewing. We also collected acceptable names of likely candidates prior to start up and just shuffled these ones into place.

We do our own screening, basically the same as for regular employees—aptitude, interest, physical condition, prior experience, etc.

4. The silviculture budget for this District, aside from FWDP, has continued to grow. Planting is probably starting to stabilize at about seven million trees or so annually. The difference for stand tending for 93 was one million, for 94, two million. We obviously need more trained workers.

5. We have never had reserve aboriginals apply for the program. They are totally eligible under the 25 percent open category. We have had some Natives on the program, but, for whatever reason, they have not come from a reserve, although most have been Status Indians. Some have been on UI or provincial welfare.

6. The BC 21 program does has a totally different fund for dealing with Band projects. They can get direct award projects up to $50,000. I believe some of this funding came form the old Comfor money. Only occasionally does the local band attempt to do something with this in this District. I think the last project was two years ago at about $20,000.

7. There are a number of silviculture contractors based in this District, all of whom have benefited from being able to hire graduates from FWDP and its predecessors. Without this type of government funded training, the contractors would not have the resource base available to undertake work offered. All contractors were busy in 93, and the major limiting factor appeared to be skilled workers, as it has been for a number of years.

We turn out an average of fifteen to 20 graduates each session. They are snapped up as quickly as we can produce them. We are now starting to believe the program should be slowly melded into a three-year apprentice program.

8. We therefore strongly support an increase in this type of funding, but not at the expense of regular contracting.

9. We understand from inside sources that the Ministry of Social Services has transferred all its key people in Victoria, who were involved in any form of post-secondary education, to a new Ministry established to deal with all such educational matters, including a new form of FWDP, but covering all industries, not just forestry. This has apparently occurred. Our local MSS office has been so advised, and no one appears to be able to commit to the future of FWDP, except to say that it will be run by the new Ministry.

10. Does this take MOF out of the picture? Is silviculture in the hands of educational institutions instead of contractors (sponsors)? Will it take six months to a year to get something up and running at the operational level?

There are current proposals being considered on the martini circuit that include an institution like Cariboo College taking over all adult education within the Interior. With no disrespect to that fine institution, this has been tried before, and our industry ended up with two seasons worth of graduates (at a 24 percent success rate), who knew the Latin names of 50 different trees and shrubs, but weren't quite sure which end of the chainsaw to hold.

There is a proposal that the Justice Institute take over silviculture training. This would entail selection of participants at the local level, shipping them to the coast, accommodating them while being trained, and then sending them back. I see no sense to this. Participants need the on-site training, taught and supervised by competent people who have earned their spurs by having been in the field.

If these sorts of ideas end up as reality, then it is guaranteed that such programs will fail.

As a final thrust, the obvious answer to the environmental concerns which now have strong public support, is better forest management, which translates into intensive silviculture management and activity. I have been told by Kamloops Region of MOF that they estimate there is at least ten years work in this Region for 10,000 silviculture workers—but no funding, and no mandate for the licensees to undertake it.

This, of all years, must be the time for us as an Association to get with it, and push for what we see is right.✥

Alberta Silviculture Tour

Dirk Brinkman, WSCA President

These are my notes and impressions of the Septermber 1993 Alberta Silviculture Tour coordinated by the Alberta Ministry of Natural Resources . On the tour we examined stands which were seeded or planted between 1967 and 1981 south of Grand Prairie.

Unpopular Stocking Standards

Most stands were adequately stocked with conifers above minimum densities, but were overgrown with higher densities of aspen or Balsam Poplar. This raised the question — on behalf of hundreds of thousands of hectares — of what to do. Provincial stocking standards currently have a conifer bias which appropriately reflects the comparative difficulty of restocking conifers. Free growing standards require conifers to be free of deciduous competition. However, these standards were set before the increasing importance of aspen was realized.

Protective Harvesting

Leaving these stands another 30 to 40 years for a careful aspen harvest, to then release the conifer for a second harvest in a further forty years, would maximize the yield. This practical regeneration option for a predominantly coniferous area raises difficult questions about the current standards that industry has to meet.

An initial trial in Hinton, which had the aspen overstory harvested, had many of the released conifers blow down. The understory conifers had developed too large a crown sail area for the root stability. (see "Timber-Harvesting Techniques that Protect Conifer Understory in Mixed-wood Stands," E.P. Sauder, March '92, FERRIC) Further refinement in our stand management practices and harvesting techniques may allow some application of this option and perhaps even enable us to design for it.

Harnessing Selection

The horse logging site on the tour had released enough undamaged residuals to qualify as stocked under Alberta's low, minimum stocking standards, provided that the aspen overstory at the time of the free growing survey could be considered acceptable stocking and not competition from which conifers should be free. Conifer stocking was clumpy and distribution was poor. Current standards would hopefully require that the trails and openings be fill planted.

Interestingly, the tour stop was on a plot which had been logged in the 1940s by German woodsman, then prisoners of war, who had, measured from the stumps, extracted 344 M3/ha. Weyerhauser extracted another 328 m3/ha in 1993 giving that plot an MAI of over 7 m3. An aspen harvest in 2010 and a third conifer harvest in 2040 may even increase the average MAI during the next two cuts. The Weyerhauser forester advised however, that the Forest Service plot was non-representative and no further data was available.

Club Roots

It shocked me to find that, even after sixteen to 27 years, the extremely poor root form of the planted stock, compared to the good root form of the seeded sites, was so dramatically evident. The Spencer-Lemair SL 102-40 or SL 70-65s of that day are rarely grown today. I was surprised to find that the poor root distribution, massive root balls, J-roots and poor stability of both pine and spruce Spencer-Lemairs was so severe that almost all planted trees root forms still exhibited it.

These observations increased my sense of urgency to have the industry shift to improved containers. It also suggested that the larger containers and copper block root forms may be inadequate root architecture adjustments to gain the stability and growth performance that will be needed for conifers to become a vital component of a mixed wood stand. Aspen is a very aggressive performer and comes into the stand without any nursery constriction to its root form, making it a tough competitor for nutrients and moisture.

Alberta stocking standard's regen lag seldom permits the slower direct seeding option and companies are not risking much direct seeding. The 1967 to 1978 direct seeding sites on the tour would not have met free growing standards within fourteen years.

Regeneration standards task force

Industry and Environmental Protection have formed a Regeneration Standards Task Force to "investigate the appropriateness of reforestation standards, specifically the height, stocking and freedom from competition requirements for all ecosystems of the province ... and recommend changes." Besides having to profile the standards to conform to elevation and latitude changes, and within the ecosystems to wet and dry zones — the task force will have to determine if the minimum standards are too low.

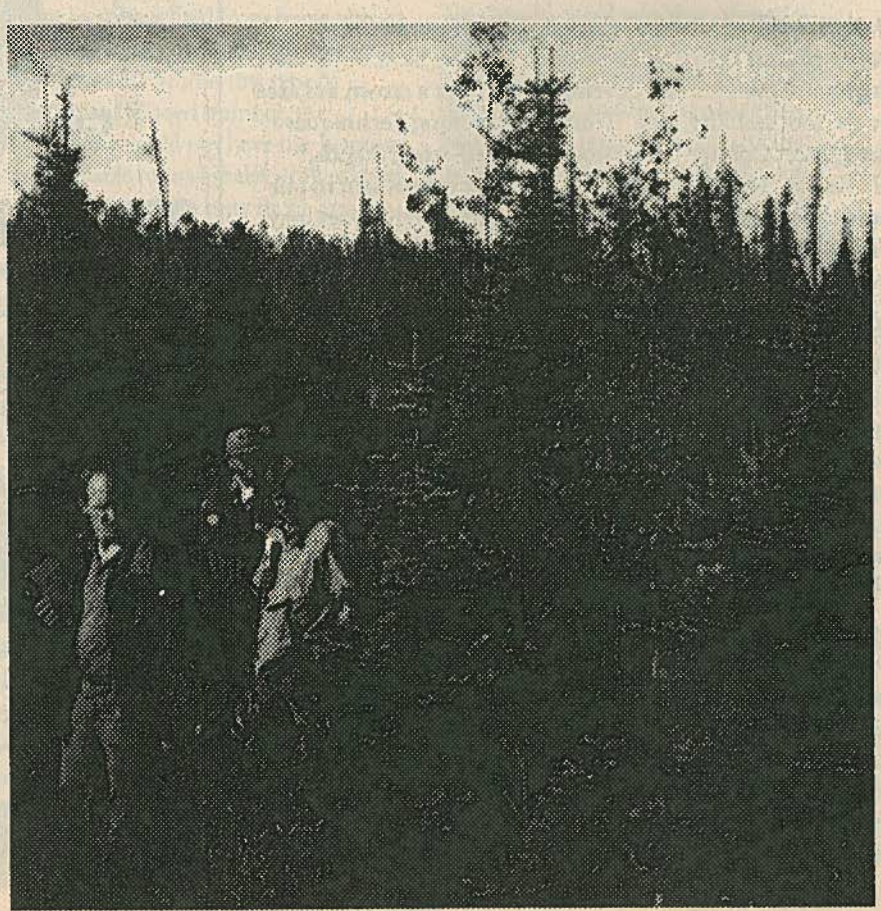
The CSA has been calling for high-value, ecosystem-appropriate stocking standards to be in place across Canada. In fact, it is calling for a Great Ecological Wall of high-value stocking standards to create an entry barrier in our international markets for the Siberian/Mongolian forest products soon to flow from the new freer markets of the old Soviet Union. BC presently has such stocking standards in place.

A rough comparison of BC's stocking standards with Alberta's is interesting. In BC, the average number of stems harvested per hectare is approximately 250; in Alberta, it is approximately 400. Given equal forest renewal success, Alberta's stocking standards should be 166 percent of BC's. In the Boreal forest, BC's minimum trees/hectare is 700, so one might expect Alberta's minimum standards to be about 1100 stems per hectare —especially with the predominant utilization being for pulp. While many of the FMAs are getting consistently higher minimums because their goal is sustainable conifer harvests, Alberta's regulated minimum is currently 500 trees/hectare.

Clayoquot in Edmonton

At the end of the week, and as I was travelling with my twelve-year-old son, Erik, we decided to take the train home to Vancouver and found ourselves on the Cross Canada Clayoquot Caravan crusade to the West Coast. There are many illustrations of good and bad silviculture which can be viewed from the train, and the ride with the protestors allowed for well-illustrated discussions about forest management in the west in the observation car.

The Caravan train, billed as "From an ocean without fish to a forest without trees", pulled over above Weldwoods pulp mill in Hinton to allow a train load of lumber from Weyerhauser, Tolko, Gorman Bros, the Slocan Group, Adams Lake (from the interior of BC) and Domans (from the West Coast) glide by, leaving me to wonder at the sharply divided forest-management directions riding the Trans-Canada rails.



Roots not limiting performance in BC

Henry J. Benskin, RPF, Director, Silviculture Branch, BC Ministry of Forests

Note: Letter to Canadian Silviculture Magazine Editor, December 24, in response to the article "Seedling Roots and the Forest Floor," published in the last issue.

With regards to the article "Seedling Roots and the Forest Floor," page eight of *Canadian Silviculture Magazine* (Fall 1993), I would like to offer comments on a number of points raised regarding the Ministry of Forests' reforestation program.

The reforestation program in the Province of British Columbia has been proven to be very successful since the first trees were planted in 1930. The program has grown to a level of over 200 million trees being planted annually. As well, the survival rate has climbed to over 87 percent for two-year-old plantations. This cannot be regarded by world standards as "a considerable loss of performance," as the article indicates. Part of the program's success can be attributed to the emphasis that the government and industry places on improving nursery culture and an increased emphasis on microsite selection in the field. There has been major research in seed selection, nursery culture, seedling quality, handling and planting, and site preparation.

The BC Ministry of Forests is most definitely interested in the biological performance of the seedlings, including their root systems. In fact, the ministry has had active research on root systems since the early 1970s. In 1978, we sponsored an international symposium on Root Form. We are also continuously monitoring seedling and root development, and through research, monitoring, and extension services, we develop and incorporate improvements into our reforestation programs. For example, the development of copper-treated containers, as well as black-out treatment to induce dormancy and cold-hardiness, have been effective and timely solutions. We are also continuing to monitor all aspects of our plantation development.

The article provides a general overview of factors effecting early establishment of planted and natural seedlings. I am concerned about the technical validity of several points that are presented in the article, and feel they should be examined through scientific peer review. One major point with respect to

continued on page 47...

Roots roundup

Dirk Brinkman, President WSCA

Silviculture Branch Director Henry Benskin comments in the preceding letter that the technical points in the article "Seedling Roots and the Forest Floor" require peer review. The technical version of this article has in fact gone through an extensive peer review process prior to being submitted to the *Forest Chronicle.*

In addition, the co-authors have a wide range of scientific, technical and operational experience. Lead author Al Baliski is a UBC Graduate ecologist with an MSc in Forest Soils. He is currently working for Fletcher Challenge in Mackenzie, BC. Co-author Christian Walli, RPF, was nursery manager for Canfor/Balco for eleven years and has been manager of Brinkman & Associates Ontario nurseries for five years. I am a co-author and have been a silviculture contractor for twenty-five years, responsible for the planting of more than 400 million seedlings.

Co-author Peter Salonius is a well known soil microbiologist and and has been a forest seedling researcher with the Canadian Forest Service for 28 years, as well as providing nursery extension services out of New Brunswick. His recent related study, "Peat Plugs versus Styroblock Plugs" has been summarized in both MOF and Forestry Canada silviculture bulletins (see sidebar).

More root research

An increasing amount of field research is showing that the vertical root architecture of all hardwall container (and Paperpot) systems compromises the initial potential growth response of seedlings.

In their paper, "Container Related Roots Deformation and Growth Reduction of Douglas-Fir and Lodgepole Pine Saplings 11 Years After Planting," M.R. Halter and Prof. Chanway of UBC Forest Faculty compared an eleven-year-old natural stand with an adjacent Styroblock container plantation in Golden, BC. They found that Styroblock Lodgepole pine height was 69% of the naturals and the Styroblock Douglas fir height was only 53% of the naturals. Even worse, the leader length for the container pine was 44% of the naturals and the fir 26%— this implies that the problems caused by root architecture may be cumulative.

Anders Lindstrom, of the Swedish University of Agricultural Sciences, reports in his paper, "Stability in Young Stands of Containerized Pine," that hardwall container systems (Panth Hiko and Multipot) had up to 20:80 ratio of lateral to vertical roots. Soft-wall air-pruned containers (Plant System 80) had a 50:50 ratio of lateral to vertical roots which is equivalent to naturals. The growth potential of Sb was also shown to be compromised in the hardwall containers in an eleven year comparison to naturals.

The 1991 report "Root Systems and MSP," prepared by Robert Scagel and Richard Evans of Pacific Phytometrics Consultants for Ft. St. John MOF District Office, notes that "Most of the roots have been initiated *insitu* rather than being bought at the nursery." Furthermore, "the most active part of the plug's ...root growth... is probably only the top 5 cm."

Free Growing Root Standards

Natural root form is required for stability to prevent blow-down and for growth adequate to compete with naturals and other vegetation. Roots that are contorted and constricted may prevent seedlings from giving us a positive return on the forest renewal investment. With BC forest companies paying for the initial growth to free-growing, it may not be long before the underground portion of the seedling gets a fair share of attention.

Once the issues are more clearly defined, I believe MOF and industry will develop standards for free-growing root form. ❖

Peat Plugs versus Styroblock Plugs

Canadian Forest Service Impact Note #5

Studies conducted at Natural Resources Canada (Maritimes region) show that seedlings reared in mesh covered peat plugs are superior to those reared in walled containers. Additional plantation establishment costs (which may run as high as $900/ha) can be substantially reduced or avoided as replanting will be less extensive. Established free-to-grow seedlings will also experience increased growth rates.

Peter Salonius of Natural Resources Canada, in the Maritimes, observed that seedlings grown in mesh covered peat plugs develop improved root form in comparison to seedlings from walled containers, whether they were in the nursery for a few weeks or a few months. Root growth occurs along the entire length of the mesh plug, resulting in better root regeneration capacity, higher survival rates, and up to double the early growth rate.

Salonius reared jack pine and black spruce seedlings in walled and mesh systems for various lengths of time before outplanting. Three years after outplanting, he compared the seedlings' root systems. Of the walled container grown seedlings only fragile plugs (12 weeks from seeding) produced good support roots, but these plugs could not be readily extracted from the cavities for typical piece work planting operations. The firm plugs, amenable to normal handling (more than 16 weeks from seeding), rooted mainly from the bottom of the planted plug, greatly increasing the risk of toppling.

Planting stock specification often demands rejection of plugs that do not hold together when extracted. Seedlings from mesh covered plugs have very low cull rates because the root systems are kept intact by the mesh. Walled containers have cull rates at shipping of up to 40%.

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Silviculture Branch root form reply

the Ministry of Forest's planting program should be clarified at this time. It is not a standard requirement of the ministry for a planter to screef to mineral soil prior to planting a seedling. It is clearly stated in a number of ministry publications, including the Silviculture manual, as screefing to mineral soil as required in accordance with a planting prescription. This is further emphasized in a recent study that indicated that, in certain soil conditions, occurrence of frost heaving can increase with the amount of mineral soil exposed.

I am concerned about the rather misleading comparison of seedling root development illustrated on the bottom of page twelve. To show the root development in pine versus spruce, two tree species that exhibit distinctly different rooting morphologies, is not a valid comparison.

With respect to root development, many studies have been conducted on the roots of planted seedlings over the last 30 years. They have shown that root development is a function of the container, the nursery culture, the site characteristics, and the planting technique. Recently, the Ministry of Forests has completed the excavation of over 1000 root systems, and will be producing a comprehensive and well-documented report on root development in BC. These excavations corroborate the results of other studies and indicate that seedlings grown to current BC nursery standards produce healthy vigorous plantations.

The BC Ministry of Forests is continuously reviewing reforestation practices based on sound scientific technique. These reviews have made, and are expected to continue making, improvements in reforestation. The weight of scientific evidence does indicate that BC's container seedling plantations are not subject to risk of toppling or reduced growth. Many of the container seedling plantations in BC exceed 20 years of age and are healthy and vigorous forests.

Western Silvicultural Contractors Association

1994 Conference and Workshops ❧ Burnaby Villa Inn

ECONOMICS AND THE ENVIRONMENT:

Effects on future employment in the silviculture industry

Training Courses: Jan 31–Feb 2 ◆ Conference: Feb 3 ◆ AGM: Feb 4

The WSCA conference will once again deliver lively discussion of topics vital to the silviculture industry. Reductions in AAC, smaller cut-blocks, the net-down of NSR land and environmental pressures have all reduced the amount of work available to us. Add to this increased government regulation and loss of work to social assistance and UIC training programs (BC 21), and we are being squeezed on all sides.

What role will we play in the forest industry of the future? Come to the conference, hear what "the experts" foresee for us and question those who run the regulatory agencies.

Regulation bear pit session

In the morning session, we will be joined by guests from the Ministry of Forests (MOF), Employment Standards Branch (ESB) and Workers Compensation Board (WCB). Rather than making speeches, they will answer some specific prepared questions. Then an invited moderator, CBC Radio's Phillip Ditchburn, will open discussion and take questions from the floor.

All these agencies have a direct impact on our costs— and major regulatory changes are taking place in many of them. What are the proposed changes and how can we influence them? How much will these changes cost us? How will new Forest Practices Code and Site Degradation Guidelines affect us? These and many more questions will be asked. Be there to hear the replies.

Policy and vision

The afternoon session will be more of a traditional speaker presentation— we will get the opinions of some of the more knowledgeable and influential people from all parts of the political/environmental spectrum on where they see our industry heading. Rumour has it that we may even see a knock-down drag-out Great Root Form Debate with surprise guest heavyweights.

In the evening after the traditional Horizon hospitality suite, the Honourable Minister of Forests, Andrew Petter, is scheduled to be the after-dinner speaker. Petter is relatively new in this portfolio and we wait with interest to hear his vision of the future.

Throughout the day there will be a silviculture trade-show with a no-host bar. Explore the new technologies available to us, talk to the suppliers, and shop around.

Workshops you can't afford to miss

Sandwiching the conference day are two other very important activities for silviculture contractors. For three days before the conference, we are offering a variety of courses for upgrading and updating skills of contractors and their key personnel. The traversing courses were over-subscribed last year, so please register early. The bear avoidance course was well received last year and highly recommended by all attendees. To have a qualified Wildlife Danger Tree assessor on your crew at all times is becoming essential. And you can take this course in conjunction with attending the conference. There is also an important course for site-preparation contractors on the new site degradation guidelines.

Finally, the day after the conference is the WSCA AGM. Don't miss it— this is your organization and it needs your participation. We will be considering a number of resolutions and next year's directors will be elected. Bring your beefs (and plaudits) and let's chart a new direction for 1994. For information or registration call 736-8660❖

I N V I T E D S P E A K E R S

REGULATIONS: ***Marc von der Gönna, Silviculture Branch:*** **Site Degradation Regulations** • ***Mike Wyeth, Silviculture Branch:*** **New Forest Practices Code** • ***Robin Brown, Silviculture Branch:*** **Silviculture Planning and Programs** • ***Hans Suhr, Employment Standards Branch:*** **Changes to the Employment Standards** • ***Rex Eaton, Coordinator for Regulation Review, WCB:*** **New Regulations for Camp Standards,First Aid, & Transporation** • ***Brian Storey, Silviculture Branch:*** **Forest Worker Development Program** • ***Colene Wood, Silviculture Branch:*** **Silviculture Training Programs** •

POLICY: ***Honorable Andrew Petter, BC Minister of Forests:*** **The Future of Silviculture in BC** • ***Janna Kumi, President ABCPF:*** **Professional Ethics and Forestry Certification** • ***Anne McLellan, Federal Minister of Natural Resources:*** **Sustainable Canadian Forests** • ***Gary McKellar, Forestry Canada:*** **Internal Auditing of Forest Operations** • ***David Perry, Oregon State University:*** **Ecosystem Silviculture**

Hazardous climate instability forecast by scientists:

NY Times News Service

To the astonishment of climate specialists, an analysis of ice extracted from the full depth of the Greenland ice sheet has shown that, except for the 8,000 to 10,000 years since the last glacial epoch, the climate over the past 250,000 years has changed frequently and abruptly.

The findings suggest that the period of stable climate in which human civilization has flourished might be unusual, and that the current climate may get either warmer or colder much more quickly than had been believed— in spans of decades or even less.

The data are likely to bolster concern that future changes in climate might not be spread over many centuries, allowing farmers to adjust to altered growing conditions and coastal cities to deal with rising sea levels, for example.

Commenting on the new research, Andrew Weaver of the University of Victoria said that if the climate becomes colder, Europe would be covered with snow much longer. As glaciers advanced, he said, they would reflect more of the sun's energy back into space, chilling the climate even more.

The scientists said their data showed that a significantly warmer period and a significantly colder period had occurred during the last interval between glacial epochs, about 115,000 to 135,000 years ago. They said they could not tell whether that meant similar changes were in store.

Previous studies had shown that there were abrupt changes in climate during glacial epochs, but the new results, which are being reported in two papers in the journal *Nature*, unexpectedly showed that the same was true in the periods when glaciers had retreated. In one "catastrophic event" at the height of the last interglacial period, the average temperature plunged 25 degrees Fahrenheit, to ice-age levels, for about 70 years, the scientists said.

The authors said they did not have an explanation for the rapid shifts. They also said it was a mystery why the climate of the last 8,000 to 10,000 years has been "strangely stable".

In a commentary in the journal, J.W.C. White of the Institute of Arctic and Alpine Research of the University of Colorado said it was "difficult to express the importance" of the reports on the ice findings.

"Adaptation— the peaceful shift of food-growing areas, coastal populations and so on— seemed possible, if difficult, when abrupt change meant a few degrees in a century," he wrote. "It now seems a much more formidable task, requiring global cooperation with swift recognition and response." ❖

Can Canada keep up with Brazil?

Dirk Brinkman

The certification of wood products is gaining momentum throughout the world. The International Tropical Timber Organization has agreed that all international trade will be based on sustainably managed forests by the year 2000 (see *Forestry on the Hill*, Fall 1993). In June 1993, the Netherlands signed the Tropical Timber Covenant. These initiatives focus on fast growing fiber and timber plantations coming on stream to replace the harvest from natural tropical forest ecosystems.

Certified sustainable ecosystem

Canada has been working for international standards on sustainable forestry, first at the 1992 UN Conference on Environment and Development (UNCED) in Rio and, more recently, last September as host of a Conference on Security and Cooperation in Europe (CSCE) seminar on sustainable development of boreal and temperate forests.

During the conference, the Canadian forest products industry's Sustainable Forestry Certification Task Force announced its plans to establish an independent certification program to help consumers identify products that come from sustainably-managed-forests.

No doubt the industrys efforts were spurred by the growing threat of boycotts, especially in Europe. Already three major buyers of forest products have instituted green sourcing policies. B&Q, Britain's largest do-it-yourself and garden centre retailer, has stated no products will be purchased from clearcut natural forests after 1995. Home Depot, a large US warehouse style retailer of home renovation products, has discussed certification with its suppliers (many of which are Canadian). A large Canadian company, Aikenheads Home Improvement Warehouse Inc., has asked its suppliers about providing environmentally certified lumber.

Forest renewal is the sustainable foundation

At the CSCE sustainability seminar, David Brand and John Forester of Natural Resources Canada proposed two primary criteria for measuring the sustainable development of forests: maintaining forest ecosystems and maintaining socio-economic benefits. This means sustainable managed forest ecosystems must maintain their integrity through the harvest disturbance.

The foundation of sustainable forest management is reforestation policy and stocking standards, including reforesting all areas harvested. Overall, Canada lags behind in this area, with over 250,000 hectares per year of forest not being regenerated annually. Only BC's policies of 100% reforestation for all areas harvested to a free-growing and high ecosystem-based stocking standards even approach the proposed criteria for maintaining both the ecosystem-appropriate species and the socio-economic value of the forest.

BC's great ecological wall

BC MOF recently published a final version of their Correlated Guidelines for Tree Species Selection and Stocking Standards for the Ecosystems of BC. It opens with a quote from Peter the Great, "Follow not the system like a blind man follows a wall."

With its ongoing refinement of the best forest renewal standards in Canada, BC has begun building an Great Ecological Wall of high-value free-growing standards that may protect the forest industry from international boycotts and fast growing tropical fibre. Ecosystems do not follow provincial boundaries, and BC's standards need to be examined closely in other provinces. A well-built and enforced wall of ecologically and economically appropriate standards across Canada will protect consumers' sustainable forestry interests and our forest economy.

Free growing above ground

One of the weaknesses of BC's Ecological Wall is the failure to re-examine its foundation— not uncommon when constructing a wall in a hurry. The stocking standards concern themselves purely with the above ground portion of the seedling, not its foundation — the root form. This ignores the root form consequences for seedling stability, growth to maturity and ability to compete with other vegetation.

Importance of root form

The article "Root Form and the Forest Floor" in the last issue of *CSM* has focused a good deal of discussion on the underground character of free growing seedlings.

Many researchers are finding that the vertical root architecture of hardwall container systems compromises the potential growth of seedlings.

At the Swedish University of Agricultural Sciences, researchers report that seedlings grown in soft-wall containers have a ratio of lateral to vertical roots which is much closer to that of naturals than do hardwall container systems. The growth potential of Sb was also shown to compromised for hardwall containers in comparison to naturals.

A study of sixteen-year-old plantations for the Ft. St. John MOF District Office found that Styroblock container seedlings eventually abandon the predominantly vertical container root system. Most active rooting was adventitious above the root collar into the organic and LFH layers.

Free growing root standards

Most of the three billion seedlings planted in BC have been grown in hardwall containers and as a result may have trouble competing with other vegetation and faster growing natural seedlings. It is possible that high site prep and tending costs have been necessary just to offset the handicap created by the lack of lateral root egress in seedlings grown in hardwall container systems.