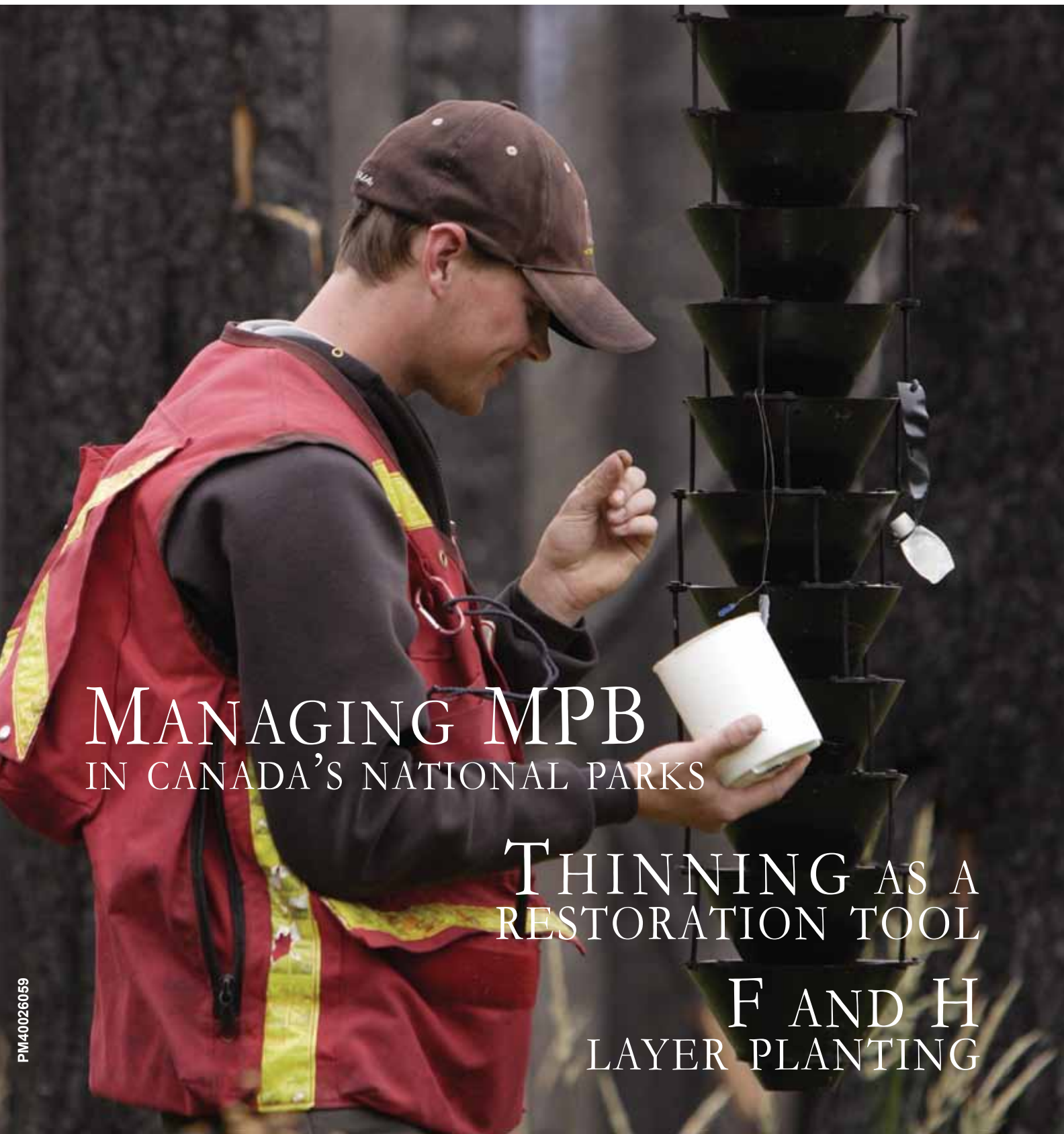
CANADIAN
SILVICULTURE
FALL 2005



MANAGING MPB
IN CANADA'S NATIONAL PARKS

THINNING AS A RESTORATION TOOL

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CANADIAN SILVICULTURE

Cover Story

On the cover, a worker monitors a Mountain Pine Beetle Trap. Parks Canada is using prescribed burning to reduce the susceptibility of the forest to mountain pine beetle (MPB) and improve biodiversity. Officials are also creating fuel breaks to reduce the risk of wildfire spread.

Features

Columns

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Editorial

by Dirk Brinkman

Integrating carbon into managing forests for timber

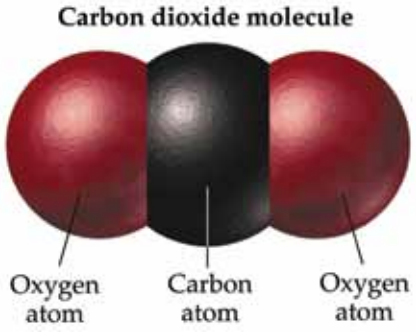
This summer I participated in the Thin Green Line conference in Thunder Bay, Ontario, which was the first national reforestation conference in Canada since 1993. Speakers at the conference questioned why, despite the forest sector's great success story of becoming accountable and reaching free growing on all of the areas harvested, there is no money for a higher level of reforestation, tending or forest management.

Of course that is why there have been no national silviculture conferences over the past 12 years. Ontario Forest company presenters made it clear that profitability from Canada's timber sector is too poor to increase investment in forest management. Ontario's Forest sector carries some of the highest stump to mill costs in the world. With the highest stump to free growing costs per cubic meter in Canada (because of the low wood volume per hectare, among other factors), making up 20% of the harvest to mill costs, the timber industry alone cannot afford more investment in forest management.

Two new primary forest management products were presented at the Thin Green Line; biomass for energy and carbon trading. This fall the Canadian Forest Service will begin to define the Afforestation Quantification Protocol to enable rigorously documented afforestation projects to sell in Canada's Greenhouse Gas Offset Trading, scheduled to begin early in 2006.

Australia's New South Wales trading program, the only other market in the world that trades afforestation carbon, planted half a million hectares for carbon credits.

In the early 1990s, during the initial climate change negotiations, the European Union held the view that including reforestation sinks may just become a substitution activity to avoid dealing with the more difficult problem of reducing industry emissions. The European Union also feared granting industrial countries credits for increases in ecosystem carbon sequestration would be like giving them free credits, because future climate warming might enhance plant growth in temperate ecosystems.



Since the last Canadian Silviculture Conference, a lot has changed. A continental-scale analysis of the effect of Europe's 2003 heat and drought stress on carbon dioxide fluxes in terrestrial ecosystems was published in *Nature*, September 22, 2005. This study showed that in 2003 the drought stress interruption of the annual summer growth cycle and related uptake of carbon dioxide resulted in a greater net contribution of atmospheric carbon than Europe's industry emissions.

In 2003, there was also a spike in the increase of global atmospheric carbon dioxide of 3.1 ppm - more than double the annual average increase of 1.4 ppm for the previous decade. This was the year of urban/forest interface fires of 2003 in California, Australia, France, Portugal and British Columbia. It was the year 23 million hectares burned in Siberia and massive peat fires burned in Indonesia.

The European study, working with carbon-flux monitors across the continent, could see clearly that the 2003 fires were just the tip of a larger greenhouse gas effect. This study suggests that in 2003 the interruption of the annual growth cycle of the world's temperate ecosystems may have contributed more to the increase in greenhouse gases than all global industry sources combined.

Today it is clear that afforestation to expand forest areas and managing forest ecosystem carbon, far from being a substitution activity, is a primary responsibility of every Party (country) to the UN Framework Convention on Climate Change. The next national challenge facing the Canadian Forest Service will be to develop a quantification protocol that can apply to the managed forests and forest licenses.

Canada's afforestation and forest management related carbon options represent 20% or 44 mega tonnes per year of its obligations in the Climate Change Plan. It may, in fact, no longer be possible to meet Canada's obligations without using all of these forest options.

What could carbon potentially add to reforestation, tending and forest management funding in Canada? Using a carbon price between the current market of $5/tonne and Industry Canada's promised maximum (or upset price) of $15/tonne, these 44 mega tonnes may have an annual trading value of up to $220 million or $660 million at Canada's upset price. These significant potential carbon benefits will take many years to implement, verify, negotiate and trade, especially because these new values have to be integrated into current land use and management practices.

However, it took from 1993 to 2005 for the number of trees being planted annually in Canada to fall from 800 to 500 million. Given the new awareness of ecosystems as potential carbon sources, as well as sinks, there is no question that by 2012 - the end of the first Kyoto commitment period - reforestation, tending and forest management in Canada will have been transformed by the integration of timber, carbon and bio-mass for energy values.

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Letter to the Editor

Dr. Lavender's article in the Summer 2005 issue of Canadian Silviculture suggests that there could be major changes in the range of coastal Douglas-fir under climatic warming, based on its winter chilling requirements. While it is important that we pay attention to this particular physiological stress, and take action where we can, many facets of tree adaptation to climatic changes must also be considered.

Past experiments on chilling requirements have been done on a few seed sources in growth chambers. This work needs to be updated to challenge trees with projected winter temperature conditions, at different developmental stages, and with more seed sources. Moreover, only within the last few years have the climate models and computer software become available to give us the first glimpses of how climate change may occur on the ground in BC.

We know from related research on Douglas-fir and other conifers that spring bud flush is greatly affected by many other factors in addition to chilling, such as photoperiod.

We also know that conifers such as Douglas-fir are well adapted to a broad range of new environments (as exotic species in Europe, Scandinavia, South America, France, and New Zealand). For natural regeneration, significant natural selection can occur in one generation, given the right circumstances, and new 'land races' can be formed, as Douglas-fir has high levels of genetic variation.

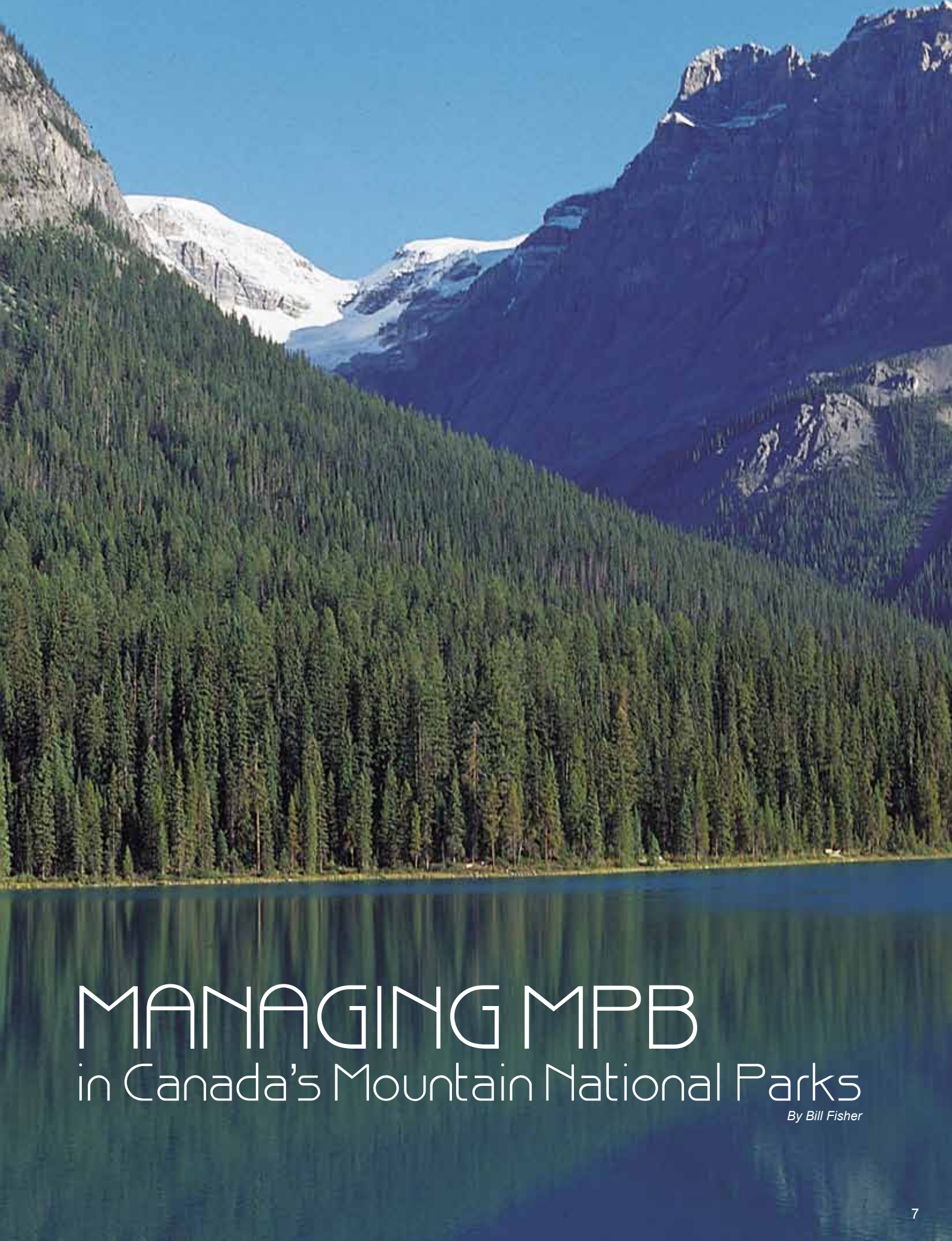
Current breeding and testing programs as well as the large network of provenance trials for coastal Douglas-fir in BC should detect significant 'shifts in adaptation' to traits affected by warming, as testing occurs in warmer and dryer climates in which Douglas-fir is currently planted. Other research supports the fact that there is considerable adaptive plasticity of conifers, particularly once they are past the establishment phase.

Nevertheless, Dr Lavender's article, written with great insight years before many of us paid much attention to climate change, points to one of many important issues that will need to be integrated in the laboratory, in short and longer-term field trials in Douglas-fir and all our other tree species, with respect to adaptation and climate change.

A. Yanchuk and S. L'Hirondelle

Research Branch

BC Forest Service



MANAGING MPB
in Canada's Mountain National Parks

By Bill Fisher

Banff, Jasper, Kootenay, Waterton Lakes and Yoho national parks comprise a significant portion of the Rocky Mountain ecosystem in Alberta and BC. These parks are key tourism attractions, welcoming over 4 million visitors every year and contributing over $1 billion in tourism related expenditures. The parks are also at the eastern front of the rapidly expanding mountain pine beetle population.

The mountain pine beetle is an endemic species in the southern mountain national parks. Periodic outbreaks have been documented in Banff, Kootenay and Waterton Lakes national parks over the past 100 years. Cold winters have typically prevented the mountain pine beetle from expanding its range to the eastern slopes and foothills of the Rocky Mountains and further north into Jasper National Park. However, warmer winters, an abundance of old lodgepole pine forest and high beetle populations have created ideal conditions for this insect to flourish and expand its range eastward and northward.

The mandate of Parks Canada is to "protect and present nationally significant examples of Canada's natural and cultural heritage, and foster public understanding, appreciation and enjoyment in ways that ensure their ecological and commemorative integrity for present and future generations." This is an ambitious mandate. Restoring ecosystem processes, facilitating high quality visitor opportunities and being good neighbours are just some of the actions Parks Canada staff must focus on to help achieve this mandate.

Much has been written in *Canadian Silviculture* over the past 18 months about ecosystem-based management, integrated landscape management and forest fire management. Like other resource management agencies, Parks Canada officials are putting the principles and strategies outlined in these management practices to work on the ground. In the case of the mountain pine beetle, the most recent population expansions have prompted Parks Canada to accelerate a program of prescribed burning. This program has three integrated objectives:

1. Restore the ecological integrity of national park lands by putting fire on the landscape, in a safe and prescribed fashion, to mimic this natural process.

2. Reduce public safety threats from wildfire.

3. Reduce the susceptibility of lodgepole pine forest to mountain pine beetle.

Parks Canada has been using prescribed fire as the primary tool in the restoration of terrestrial ecosystems for over 25 years. As our knowledge of these ecosystems has improved, park officials have been able to create a policy, expressed in corporate and specific park management plans, about using fire to restore ecosystems and increase biodiversity. In the case of Banff National Park, the objective is "through prescribed burns and not suppressing fires caused by lightning, achieve a target of 50% of the long-term fire cycle or approximately 14 km2 burned annually."

Beginning in 2000, park officials in Banff National Park integrated all 3 objectives on parklands between the communities of Banff and Harvie Heights. These lands,

Interpretive exhibit on forest health in Waterton Lakes National Park

Photo by Jackie Syroteuk, Parks Canada

commonly referred to as the Fairholme Bench, are critical montane habitat. Close to 80 years of fire suppression created conditions where aspen groves and grass meadows were replaced by an over-mature lodgepole pine forest. Putting fire back onto this landscape was considered necessary to restore the ecological integrity of the benchland.

The threat of wildfire running down the Fairholme Bench towards the communities of Harvie Heights and Canmore was also a concern to park officials. Although counter intuitive, prescribed fire can also play a key role in reducing the threat of catastrophic wildfires damaging businesses, visitor facilities and neighbouring communities by reducing the fuel load in the forest. However, before conducting such a burn, it was necessary to create appropriate fuel breaks and thin the forest.

At this time, it also became apparent that mountain pine beetle populations were expanding rapidly in BC and taking hold in some isolated locations in Banff National Park. Parks Canada proposed a two-pronged approach towards managing the mountain pine beetle. Like many other resource management agencies, Parks Canada is involved in pheromone baiting, monitoring green-attacked trees, and falling and burning trees in some locations prior to the next beetle flight the following summer. This reactive approach essentially treats the symptoms of the outbreak. It is a critical part of the management program, but Banff and Jasper national parks cover 16,000 km2. Such an approach alone will not be effective in managing the outbreak and eastward/northward expansion of the mountain pine beetle population.

A second, and more proactive approach, involves assessing the existing forest for its susceptibility to mountain pine beetle. This work is guided by computer modeling that examines age and stand data of lodgepole pine forest in the mountain parks and overlays these areas with an insolation model that calculates the heat units available (watts/m2) during the critical winter period. As already mentioned, the

Fairholme Bench, 1923

Fairholme Bench, 1985

Monitoring a Mountain Pine Beetle Trap in recently burned forest in Banff National Park

Photo by Parks Canada

mountain pine beetle is at the limit of its historic range in Banff National Park. Therefore, even with the recent string of warmer winters, the beetles are most likely to successfully over-winter in areas where there are higher insolation values - these tend to be on south-facing slopes in the eastern ranges of the Rocky Mountains of Banff and Jasper national parks. With this historic information, and computer modeling, park officials are able to predict which stands of lodgepole pine forest are most susceptible to attack. The Fairholme Bench area was a prime area for mountain pine beetle expansion.

By knowing which forest slopes and areas are most susceptible to mountain pine beetle infestation, park officials can direct management actions to change the composition and age structure of these forests before the insect arrives.

In 2003, after several years of consultation with affected stakeholders, approximately 4,500 hectares of over-mature lodgepole pine forest were burned in the Fairholme Bench area.

Carrot Creek Fuel Break, Fairholme Bench

Post-fire monitoring continues to assess the impacts of the fire on biodiversity, mountain pine beetle density and other parameters. Communication with interested parties continues.

Parks Canada has proposed an ambitious 20-year plan of prescribed burns to improve the ecological integrity of Banff and Jasper national parks. These prescribed burns alone will not prevent the continued east and north expansion of the mountain pine beetle. However, the burns and loss of over-mature lodgepole pine forest will make it harder for mountain pine beetles to find suitable habitat in these two national parks and it appears to have helped slow down the eastward expansion.

Although prescribed burns can be used to mimic historic natural processes, the implementation of a large scale burning program involves many years of work to consult with affected parties (e.g. First Nations, tourism industry, forest industry, adjacent residents, commercial businesses, communities downwind, provincial agencies, etc.) to explain Parks Canada's proposed management actions and more importantly to obtain feedback, comments and suggestions on the program. Residents and businesses of adjacent communities are understandably concerned about fire, especially if it is not effectively contained. Parks Canada has worked hard to demonstrate how fire can be used effectively but that does not mean we have the complete trust of all affected stakeholders all of the time. Appropriate fuel breaks and/or tree thinning are necessary to protect park facilities (e.g. campgrounds, picnic areas), park businesses, residences and adjacent communities before any prescribed burn is begun. It is always necessary for park officials to demonstrate to affected

Carrot Creek Fuel Break, Fairholme Bench

Fairholme Bench Prescribed Burn, May 24, 2003

Photo by Hans Reisenleiter, Parks Canada

parties that they have taken the necessary steps to protect their homes, businesses and indeed their families from a fire.

Parks Canada's policy prohibits logging, as a commercial activity, but it does permit the removal of trees for public safety and resource management reasons. The creation of fuel breaks, through mechanical harvesting is a necessary action if we are going to confidently and safely put fire on to the landscape to improve biodiversity, reduce the risk of wildfire spread and reduce the susceptibility of the forest to mountain pine beetles.

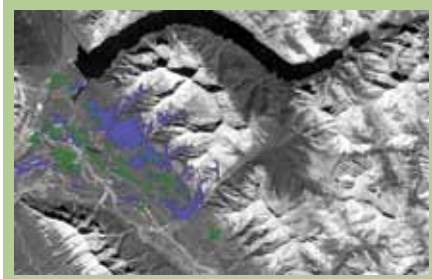
Over the past three years, Parks Canada has benefited significantly from funding provided by the Canadian Forest Service, Natural Resources Canada MPB initiative. Because of this increased funding, Parks Canada has been able to provide an on-the-ground laboratory for many scientists to: conduct much needed research on the effects of different MPB management techniques; undertake follow-up monitoring; and examine the social attitudes and opinions of local residents and visitors about the ecology of the mountain pine beetle. This funding has also been instrumental in helping Parks Canada develop new and innovative interpretive and educational programs and exhibits that explain the natural history of this forest insect, management implications and its impact on the Rocky Mountains ecosystem, inside and outside our mountain national parks.

Parks Canada's efforts, coupled with strategies being developed by the forest industry and the provinces of Alberta and BC are enabling resource managers in all of these jurisdictions to work collaboratively on a true ecosystem basis.

Bill Fisher is Executive Director at Mountain Parks Canada. He can be reached at 403-762-1560.

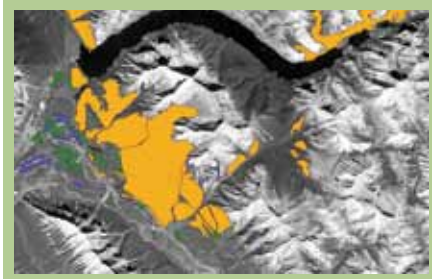
Sheep Corner Prescribed Burn, Lake Minnewanka, May 28, 2003

Photo by Parks Canada



Fairholme Bench Insolation Values up to 190,000 Watts/m2 – July

Photo by Darrel Zell, Parks Canada



Fairholme Prescribed Burn Area – May – August 2003, 4420 ha

Photo by Darrel Zell, Parks Canada

Forest Health

by Don Cameron

The long struggle continues against Dutch Elm Disease

Dutch elm disease (DED) was introduced into North America from Europe around 1930 and was first found in the Maritimes at Woodstock, New Brunswick in 1957. The disease subsequently spread through the province and in 1975 occurred in all counties. It was first detected in Nova Scotia in 1969 and has since spread throughout the province. The disease was first discovered in PEI in 1979.

Sanitation

As DED became more widespread in the Maritimes, more communities faced the possibility of losing many or all of their aesthetically valuable elms. It is virtually impossible to eradicate the disease or prevent its occurrence in an area, but there is a practical proven method, which when stringently followed, can substantially reduce the number of trees that become infected each year - sanitation.

Sanitation programs can be started anytime but to be most effective should be undertaken before the disease appears. The Town of Truro, like the cities of Halifax and Fredericton, created programs to deal with DED more than 30 years ago. The result of not taking action is obvious by the absence of healthy, living elms in areas such as Colchester County, Windsor area and river valleys throughout the mainland where virtually all of the once stately elms have been decimated to skeletons and stumps.

Sanitation programs involve the removal and destruction of potential elm bark beetle breeding material. All elms - dead and dying from any cause - should be cut. Dead and dying branches should be pruned from healthy trees and all of this material should be burned or buried. Also, bark should be removed from all stumps to below-ground level. Ideally, sanitation should be practised throughout the year every year.

Signs of the disease

1.Elms leaf out in the spring with smaller than normal leaves on one or more branches or over the entire tree. Some small branches may be dead. These conditions may mean that the tree was infected with DED the previous year. Later in the summer it is not possible to distinguish between autumn colouring and the late-season signs of DED.

2. Early signs appear from mid-June to mid-July. The leaves on one or more branches wilt (droop) and curl. Later they shrivel and turn brown. The brown, shrivelled leaves usually remain on the tree. Elm leafminer damage may appear similar from a distance, but usually the entire tree is affected when the tiny leafminers chew away the inside tissue of the leaves, turning them dark brown.

3. Later signs include one or more branches becoming yellow and drooping (flagging). Affected leaves drop prematurely. Leaves on succulent branches (suckers) or twigs - especially those growing out of the trunk - may wilt and turn brown.

According to Truro Tree Technician Andrew Williams, other DED symptoms include the characteristic brown streaking under the bark, in the sapwood of affected branches. Sample images of DED symptoms may be viewed on the Town of Truro website (www.town.truro.ns.ca) on the Tree Committee homepage under Insects and Diseases.

Confirmation of the Disease

Although DED recognition is usually straight forward for trained professionals, to confirm that DED is in a given tree it is necessary to take samples of living branches showing signs of the disease. Since these are usually high in the tree, sampling is best left to an arborist or professional familiar with tree climbing. If DED is present, the cut end of the branch will have a brown stain from the streaking in the outer ring of wood. For an absolutely positive identification of DED, the branch would have to be cultured at a dedicated laboratory.

How the disease kills trees

DED is caused by a fungus. Tiny spores of the fungus carried by elm bark beetles are rapidly spread through the water conducting system of elm trees, causing wilting and death.

The disease is spread mainly by two species of elm bark beetles, the native elm bark beetle, and an introduced species - the smaller European elm bark beetle. The two insects can be identified from the characteristic pattern of their galleries on the surface of the wood. It is important to note that these insects breed in the bark of dead and dying elms. If these trees have DED, the emerging adults may carry spores of the fungus. These beetles fly to healthy trees to feed on the bark or branches. During the feeding, DED spores are introduced into the water-conducting system, and the tree develops DED.

In addition, where elms grow close together, DED may possibly be passed from diseased trees to healthy elms by root grafts when the roots intertwine.

Control of DED

Testing on methods of controlling DED has been carried out in a number of research centres. New methods are being developed. At present, control measures are aimed at both prevention and control. Prevention is of course better than a cure.

Prevention starts with keeping elms healthy, vigorous and properly pruned. If the disease is already present in your area, sanitation is the most important preventative measure. This provides the speedy removal of dead and dying elms, and is essential to prevent the buildup of beetle breeding material.

Preventative measures involving the use of chemical sprays or injection of chemicals has received some research, but as yet has not provided any reliable prevention or miracle cures.

Don Cameron, RPF is with the Department of Natural Resources in Truro, NS.

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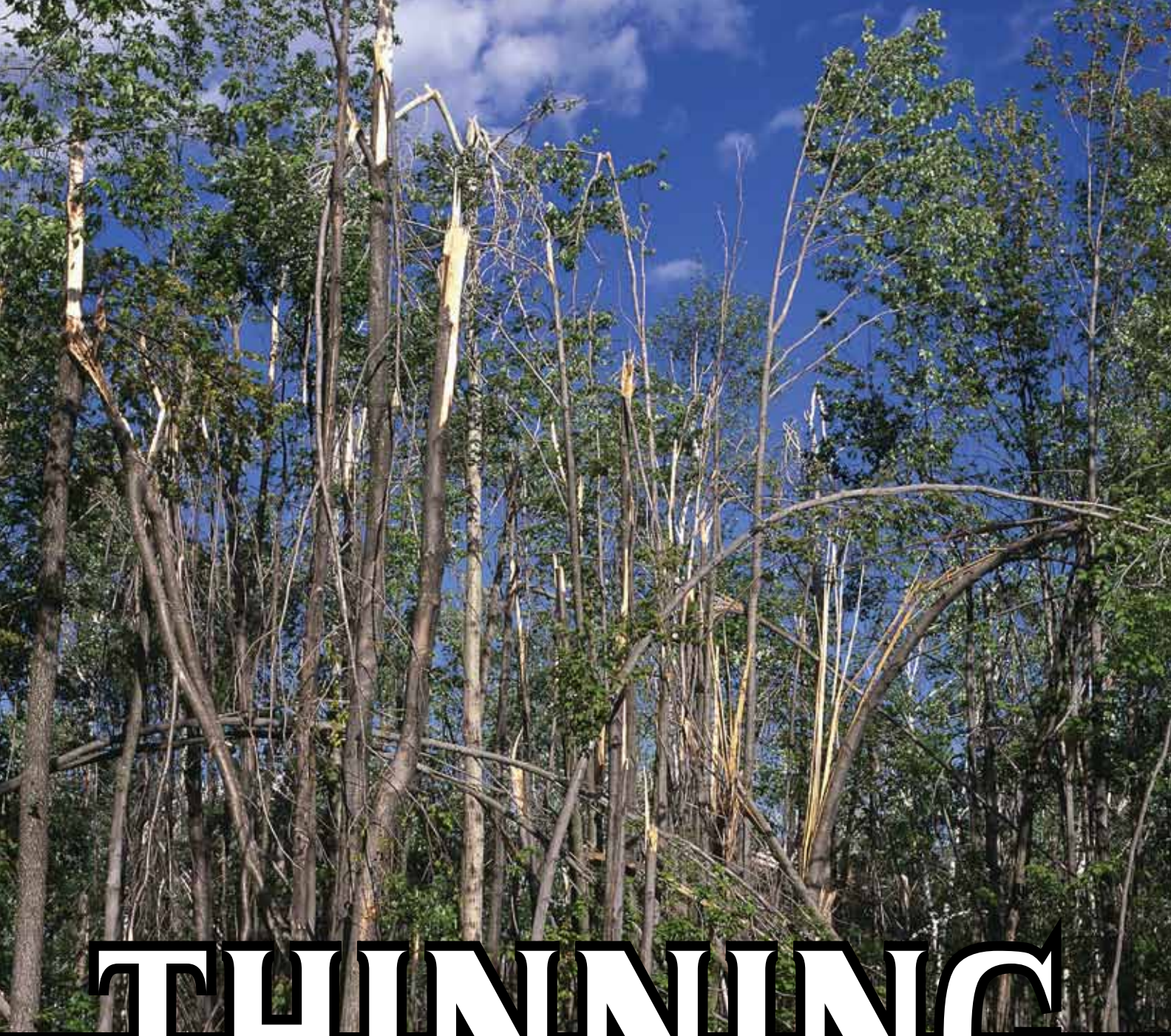

THINNING as a restoration tool

By Amelia Needoba and Bruce. A. Blackwell

Historically, thinning in BC has been used as a silvicultural tool to reduce stand competition, concentrate growth on fewer stems, and reduce the average rotation age.

More recently, the area thinned for silvicultural purposes has been greatly reduced; largely due to reduced stand volumes at rotation and the economics of carrying the investment over a significant period of the rotation. Thinning, as a restoration tool, gained acceptance in BC for use in riparian ecosystems as part of the Forest Renewal BC (FRBC) mandate. Its objectives in these ecosystems were to accelerate the growth of coniferous trees around water bodies and to increase the input of coarse woody debris into aquatic ecosystems. The wildfires of 2003 emphasised

the importance of thinning as a tool for ecological restoration in the dry forests of the BC interior. Since European settlement, a number of changes have occurred in BC's forested ecosystems. Changes are particularly noticeable in ecosystems adapted to frequent low-severity fire regimes (e.g. bunch-grass, ponderosa pine, and interior Douglas-fir ecosystems). These changes relate to increased stand density (encroachment), decreased biodiversity and related alterations in wildlife habitat. Effective fire suppression, road building, grazing and selective logging of large-diameter trees has facilitated the degradation of these ecosystems. Increasing stand densities associated with the effects of long-term fire suppression have resulted in a shift from low severity surface fires to high severity stand replacing fires, which are more difficult and costly to control and result in a greater frequency of negative impacts.

Ecosystem restoration is often based on the use of management techniques that work with natural processes in order to aid the restoration of ecosystems that have departed from their historic condition. The intent is to restore desirable attributes to ecosystems so that they are able to meet multiple management objectives. In much of BC, post-settlement practices have resulted in large areas of even-aged, homogeneous, managed forest. Ecosystem restoration treatments in managed forest could create functional forests that contain high biodiversity and habitat values, while at the same time meeting traditional timber values. However, it is unrealistic to expect or plan for ecosystem restoration techniques to yield forest stands that are identical to an historic state. Even considering fire history studies, it is not possible to know exactly what the forest was like pre-settlement. Species composition, climatic conditions and fire regimes have, and continue to, change from pre-settlement times. Humans and our metaphorical ecological footprints are a permanent part of many of these ecosystems and should be considered as such. Despite this, historical conditions can yield clues for comparison to a healthier ecosystem state and provide guidance for setting goals and objectives of ecosystem restoration treatments.

there may be an opportunity to offset

the cost of treatments

by utilizing the wood from tree removal

Ecosystem restoration treatments are not appropriate for all ecosystems. Reasons for this are:

1. Treatments have a limited impact on the acceleration of the restoration process, therefore the ecosystem is better left to its own devices

2. Treatments have adverse impacts on fish or wildlife through disturbance or reduced canopy cover

3. Specific management concerns preclude the use of restoration thinning

The decision to undertake a restoration treatment must be carefully planned through the development of a comprehensive prescription. Treatments are best implemented within an adaptive management framework to provide flexibility to change. This is particularly important because the long-term impacts of restoration treatments on forest succession at both the stand and landscape level are not yet well understood.

Two commonly used ecosystem restoration treatments are thinning and prescribed fire. With the use of these two treatments, independently or in combination, ecological attributes are encouraged and improvements to forest health, fire hazard and aesthetics are generated. Also, treatments such as creating snags, damaging tree tops to create cavities, and cutting trees in patches can further enhance ecosystem restoration.

With a declining emphasis on prescribed fire, the importance of thinning as part of the treatment toolbox should grow over the coming decades. It is hypothesised that existing dry-forest, old-growth stands contain desirable attributes developed at lower densities. Therefore, thinning could accelerate the process of ecosystem restoration in many stands established in the last century. In the US, thinning has been widely applied in ecosystems adapted to frequent low-severity fire. In many cases, thinning also provides a sound method to treat stands with forest health issues.

There may be an opportunity to offset the cost of treatments by utilizing the wood from tree removal. However, it is unusual for restoration treatments to generate positive revenue. As markets and processing opportunities for small wood products such as pellets develop further this may change. It is not appropriate to remove trees in order to offset thinning costs as this will undermine the objectives and credibility of ecosystem restoration treatments. Due

within each ecosystem type, areas that already contain desired attributes

should be protected

to the nature and objectives of restoration treatments, the support of the public and other stakeholders is essential to the treatment's success.

Thinning can have a number of effects depending on the ecosystem in which it is applied. One of the most obvious effects is the increased light intensity resulting from removal of the overstorey canopy. This generally results in an increase in understorey shrub and herb abundance. A number of studies, mostly focused on ponderosa pine forests, have also found improved resource uptake, growth, and insect resistance. However, thinning, especially in drought conditions, was also found to reduce understorey species diversity in the short term, increase windthrow and wind breakage, and allow weeds to establish. Additionally, thinning may initially increase the fire hazard by creating downed woody debris and enabling fuels to dry out more quickly. However, in the long-term, the fire hazard would be decreased through increased moisture content in abundant herbs and shrubs, and lower density stands with higher crown base heights. Thinning was also found to generate a faster growth increase in 80-year-old trees than in older, pre-settlement trees (except when heavily thinned), and growth varied between stands with different management histories. Because the results of thinning treatments have been so variable, it is important to be aware of thinning densities, regeneration potential of desired species that may have been lost from the area, and season of treatment when planning restoration thinning.

In the dry forests of the BC interior, thinning should be used to produce stands of varying densities and ages as would have existed naturally in the past. Suitable sites for ecosystem restoration treatments should be prioritized based on the ecology of the site.

At a coarse scale, ecosystems that are adapted to low-severity fire regimes but are at risk from high-severity fire are generally the highest priority for thinning. Mixed severity fire regimes, such as those in sub boreal spruce and montane spruce ecosystems, would be the next priority, although determining treatments in these ecosystems would be more complex. Ecosystems adapted to high severity fire regimes, such as the Engelmann spruce sub-alpine fir ecosystem, experience fire very infrequently and usually under extreme weather conditions. Within these ecosystems, the goals, objectives and related impacts of ecosystem restoration using thinning are uncertain and therefore thinning is not likely to be ecologically or economically suitable without further research. At a finer scale, within each ecosystem type, areas that already contain desired attributes should be protected, extended and connected at the landscape level as a first priority.

The planning and implementation of thinning as a restoration tool can improve forest health and stand resistance to disease, reduce fire susceptibility and improve habitat. Determining the intensity and location of thinning treatments will be dependent on specific management goals and objectives. There is no cookbook approach to thinning and careful planning, public consultation and implementation within an adaptive management framework is necessary for success. Thinning should be considered a useful restoration tool that can help to meet the social, economic and environmental sustainability goals of forest management in BC.

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WESTERN SILVICULTURAL CONTRACTORS' ASSOCIATION

by Tony Harrison

Unified Plan Missing in Beetle Kill Battle

At the moment there is an array of disparate task forces, programs and funding from both the federal and provincial governments directed at social, economic and environmental facets of the ongoing assault on the provincial forests. But, unlike the biological connections between interrupted disturbance patterns - pests, blight, and wildfire - none of the ongoing management planning is integrated in an overarching strategy.

A large part of the problem is that the existing configuration of the interior forest licenses doesn't lend itself to making easy decisions on what areas should be reforested. There are technologies emerging that make processing the different age classes of dead wood more feasible. Logging companies are hesitant to give up rights to areas that may or may not be profit centers, and governments are hesitant to be stung with compensating licensees for losing timber value by starting restoration too early.

To deny or delay the proper rehabilitation of our forests devalues our precious resource. It exacerbates anticipated timber supply declines, increases future forest problem types, delays regeneration, amplifies the wildfire threat, and creates numerous social, economic and biological consequences for communities dependent on the forest resource.

The Western Silviculture Contractor Association has developed a strategy called Greenplan 2050, which brings a third party perspective and leadership to the issue. One of the initial stages of the plan is to develop a map base to estimate the spatial scale of the problem, thus allowing more timely restoration by helping ease conflicts between tenure holders and governments.

Our vision is to restore vigour and value to BC's forests by answering the question, "What do we want BC's forests to look like in 2050?" The idea is to come up with creative solutions that present the current forest health crisis as an opportunity to design the next generation's forests.

The initial stage of establishing a strategic working group, comprised of federal, provincial, academic and private sector scientists and managers, to guide and review the plan is in process. The plan was presented at the end of September at the UBCM Convention in Vancouver and can be viewed on our website at www.wsca.ca.

ONTARIO FOREST RENEWAL CO-OPERATIVE INC.

by William F. Murphy, RPF General Manager

The Thin Green Line Symposium - State-of-the-art Reforestation

Forest Renewal Coop and the Ontario Ministry of Natural Resources hosted The Thin Green Line, an international symposium on planting stock and stand establishment practices to enhance forest productivity on July 26-28th in Thunder Bay, Ontario. The meeting was a huge success, with 194 registered delegates from nine countries.

The symposium brought together leaders in the science and practice of reforestation and provided a synthesis and summary of state-of-the-art practices for regenerating forests the world over.

Presentations addressed four related themes:

- Status and trends of reforestation and afforestation from around the world
- Nursery methodologies to produce target seedlings
- Planting and planting site treatments to optimize regeneration
- Enhancing timber production and non-timber values through stand establishment

Throughout the plenary and concurrent sessions on the 26th and 28th, the ballroom was abuzz with conversation regarding regeneration practices from several regions of North America as well as countries such as Italy, Sweden and Japan. It was mentioned frequently by visiting forestry professionals that the presentations and information exchanged at the symposium was excellent and important.

Speakers included Jamie Lim, President of the Ontario Forest Industries Association; Dr. Robert Wagner of the University of Maine; and Dr. Lorenzo Ciccarese of Italy's Agency for Environmental Protection and Technical Services. They generated much conversation and debate among delegates. Interest was also piqued by the engaging and informative presentations of the other invited speakers: Kas Dumroese, National Nursery Specialist for the US Forest Service; Dr. Anders Mattsson of Dalarna University in Sweden; John Kitchen, President and CEO of PRT Inc.; Dr. Philip Comeau of the University of Alberta; and Dirk Brinkman, CEO of the Brinkman Group of Companies. Mr. Brinkman added a few words to close the meeting and put into perspective the importance of regeneration and the challenges facing it.

The second day of the meeting took delegates on field tours around Thunder Bay. We visited Hill's Greenhouses/Boreal Nursery as well as stops exhibiting different stages of regeneration on Bowater's licence. For some in attendance, the field tour provided a never before seen look at the entire process of regeneration practices, from the seeding, growing, extraction and planting of our boreal tree species. Tour presenters were flooded with eager questioning at each stop. It was clear that everyone was taking advantage of this opportunity to discuss issues and ideas with experts both presenting on the field tour and taking part in it.

QUEBEC

ASSOCIATION DES ENTREPRENEURS DE TRAVAUX SYLVICOLES

par Fabien Simard, ing.f., Directeur général

Un Québec en manque de culture… forestière

Au moment d'écrire ces lignes, les travailleurs forestiers québécois attendent toujours que le ministre des Ressources naturelles, M. Pierre Corbeil, dépose les mesures d'atténuation devant allégers les retombées économiques de la coupure de 20 % de la possibilité forestière. Ces mesures sont supposées être une des solutions à la crise vécue par le milieu forestier.

Mais au-delà de ces incertitudes quant à l'avenir de milliers de travailleurs forestiers, un autre problème demeure. Quoi que fasse l'industrie, la population du Québec demeure sceptique quant à l'exploitation forestière et celle-ci jouit d'une réputation peu enviable aux yeux des Québécois.

Ainsi, en plus de tenter de remédier à une situation problématique pour les travailleurs forestiers, l'industrie devrait aussi s'efforcer de redorer son image auprès de la population. En faisant voir à la population qu'il est mieux « d'aménager au lieu de ménager », tous en sortiraient gagnant. Ainsi, l'exploitation forestière serait mieux perçue et les refontes de l'industrie, telles les mesures d'atténuation, pourraient être mieux gérées et surtout, mieux reçues. Mais comment en sommes-nous arrivés là?

Une réputation, ça se cultive!

La négligence explique sans aucun doute la situation dans laquelle l'industrie forestière se trouve. Les gens qui travaillent dans ce domaine ont perdu leurs lettres de noblesse auprès de la population du Québec parce que personne ne s'est assuré d'inculquer une culture forestière digne de ce nom. Car bien que de nombreux efforts aient été investis pour développer des façons saines et efficaces de cultiver notre forêt, nous avons oublié de cultiver la ressource la plus importante : le peuple.

Pour nous inspirer, nous n'avions pourtant qu'à observer le travail réalisé par nos collègues européens. Sur le vieux continent, les travailleurs sylvicoles réalisent un ouvrage des plus respectés par la population. Pour arriver à forger cette mentalité, l'industrie forestière européenne a su éduquer son peuple sur les bienfaits de la réalisation de travaux d'aménagement. Le Québec doit absolument et rapidement suivre cet exemple.

Pour remédier à la situation, les entreprises forestières et sylvicoles devront s'organiser afin de mener une offensive leur permettant de faire connaître à la population la qualité du travail réalisé sur les territoires forestiers et ainsi, gagner la confiance du peuple. Il faut que les Québécois sachent que la récolte des arbres permet, entre autres, de contribuer à la balance positive du taux de carbone dans l'air. En effet, l'industrie a appris, grâce à différentes études, que les jeunes forêts absorbent une grande quantité de carbone qui se trouve dans l'air alors que les vieilles forêts meurent et libèrent le carbone emmagasiné. Mais cette information, qui pourrait être favorable à l'image de l'industrie, n'est malheureusement pas connue du peuple.

La même ignorance est observée du côté de l'aménagement forestier. Les Québécois ne savent pas que la réalisation de travaux sylvicoles (éclaircie commerciale et précommerciale, reboisement, etc.) permet d'améliorer la santé de la forêt et la qualité du bois qu'elle produit. Une forêt en meilleure santé résiste mieux à la maladie ou aux attaques des insectes. Elle se régénère ainsi plus facilement, plus rapidement et produit donc plus de matière première. Bref, les travaux sylvicoles permettent à la forêt d'être plus en santé, ils permettent à l'industrie forestière québécoise de rester compétitive face aux marchés internationaux et surtout, ils permettent de maintenir un bon niveau d'emploi dans les régions ressources.

Un message clair qui permettra de changer la vision qu'entretient la population à l'égard de l'industrie forestière devra être envoyé sur toutes les tribunes. Les forestiers devront se serrer les coudes et profiter de toutes les opportunités qui s'offrent à eux pour redorer leur image. C'est une question de survie de l'industrie puisque le développement d'une culture forestière, c'est aussi la promesse d'une industrie plus en santé.

QUEBEC

TRANSLATION

by Fabien Simard, RPF, Executive Director

A Quebec Lacking Culture … Forestry Culture

Quebec forestry workers are still waiting for the Minister of Natural Resources, Mr. Pierre Corbeil, to table the alleviating measures needed to reduce the economic repercussions of the 20% cut in forestry potential. These measures are supposed to be one of the solutions for the crisis being suffered by the forestry industry.

But in addition to these uncertainties about the future of thousands of forestry workers, a further problem persists. No matter what the industry does, the population of Quebec remains skeptical about forestry operations which have an unenviable reputation in the eyes of Quebeckers.

As well as attempting to remedy a problematical situation for forestry workers, the industry must try to rebuild its image with the general population. By letting people see that it is better "to manage rather than to reduce," everyone would gain. Forestry operations would be more favourably regarded and changes in the industry, such as the proposed alleviations, could be better administered and, above all, better received. But how did we reach this point?

A reputation has to be cultivated!

There is no doubt that neglect explains the situation in which the forestry industry now finds itself. Those who work in this field have lost their standing with the people of Quebec because no one has been willing to implant a forestry culture worthy of the name. Although numerous efforts have been made to develop sound and effective ways of cultivating our forests, we have forgotten to cultivate the most important resource - people.

To inspire us, however, we had only to observe the work accomplished by our European colleagues. In Europe, silvicultural workers perform tasks that the population respects. To succeed in creating this attitude, the European forestry industry has learned to educate its public about the advantages of forestry management. Quebec must absolutely and rapidly follow its example.

To correct the situation, forestry and silvicultural companies will have to organize and lead an offensive that will allow them to convey to the population the value of the work carried out in forestry areas, and thus regain public confidence. Quebeckers must know that harvesting trees allows us, among other things, to contribute to a positive carbon rate balance in our atmosphere. The industry knows from various studies that young forests absorb a large amount of airborne carbon, whereas old forests die and release the stored carbon. But these facts, which could be favourable to the industry's image, are unfortunately not known to the general public.

The same ignorance can be seen in relation to forestry management. Quebeckers are unaware that carrying out silvicultural operations (commercial and precommercial thinning, reforestation, etc.) contributes to improving the health of the forest and the quality of timber it produces. A healthier forest is more resistant to disease or to insect attacks. It is thus able to regenerate more easily and quickly, and produce more raw material.

Silvicultural operations make for a healthier forest, it allows Quebec's forestry industry to remain competitive in international markets, and above all it makes it possible to maintain a high employment level in our resource regions.

A clear message capable of modifying the public's view of the forestry industry must be disseminated by every possible means. Foresters will have to join forces and seize every opportunity offered to rebuild their image. It is a question of survival, because the development of a forestry culture is also a promise of a healthier industry.

NOVA SCOTIA
SILVICULTURE CONTRACTORS ASSOCIATION

by Alan O'Brien

I had planned to write an update on Nova Scotia's Department of Natural Resources' (DNR) release of their 5-year silviculture model. Silviculture treatment data was to be plugged into a computer model, and the model was to calculate probable wood fibre amounts a number of years into the future. The model would also consider a number of variables (natural stands, natural disasters and urban spread). Two models were to be used, one for small private woodlot owners and the other for industrial land.

The figures were to be available to the public in early 2005. The compiled data was to be used in technical decisions by DNR for the upcoming 5 years. Problems have arisen and DNR has still not released the figures. The statistics will be an important measurement for future decisions on sustainable legislation. Unfortunately, any changes to the system must be initiated by October of a calendar year to take effect in the ensuing year.

Herbiciding season is ending in Nova Scotia with the targeted vegetation shutting down for the winter. The season was relatively quiet without much in the way of controversy. Ground and aerial applications are both used in Nova Scotia, with ground applications being more accepted by the general public. Ground spraying is more time consuming and costly with some of the potential crop trees being damaged by the wheels of the heavy machinery delivering the glycophate. Ground spraying can only be used when competing vegetation is not too tall. This spraying method is used in more sensitive areas i.e. near civilization. With 50% of forested land in Nova Scotia being held by private individuals, there are going to be adjacent private properties to all spray blocks on private land.

Aerial methods are enhanced with GPS showing spray polygons on screen to the pilot and the position of the helicopter to the block. Data is recorded as the spray boom is engaged showing positions of spray being released. This can be a benefit if accusations are made about where the aircraft was spraying. It records where the pilot has flown (turns included) and when spray was being released. So the data can convict or exonerate questionable work. The GPS also lessens spray overlaps within the spray block; hence amounts/ha used on blocks are close to estimated amounts. No more spray is being applied than is needed.

PEI

ENSIGHT REPORT

by Bruce McCallum

Interest in forest floor biomass is growing rapidly in eastern Canada, no doubt spurred on by record high oil prices. We are finally seeing real money being committed to biomass-fired power plants in Maine, New Brunswick and Quebec. J.D. Irving is planning a 15 megawatt cogeneration plant to be located in the old St. John ship yard to provide power and process heat to a new gypsum wall board factory. The plant will require 400,000 tonnes of biomass fuel in the form of mill waste and woodchips produced from harvest residues. The mill waste will come from a number of J. D. Irving mills in southern New Brunswick and that will probably mean that the company will cease to sell mill waste to current users. This will likely cause a shortage of mill waste in the region and speed up the transition to forest floor biomass chips.

A new Maritime Bioenergy Working Group has formed with representation from all 3 provinces. The purpose of the group is to share information and to stimulate discussion around important biomass energy issues. The participants are from the forest industry as well as provincial and federal governments. The first 2 meetings were held in Moncton in June and August. The topics at the last meeting included presentations on bundling harvest slash and the new federal government RPPI (Renewable Power Production Incentive). This program is a derivative of the WPPI program directed at the wind power industry. It will provide a power production incentive of one cent per kilowatt-hour for approved projects for a period of five years. The program becomes operational in April of 2006 and it has a budget of $886 million. NRCAN is seeking input into the program.

CANBIO (Canadian Bioenergy Association) held a workshop on forest floor biomass in Quebec City on September 8th. The workshop had 87 participants with no space available for more. Copies of the workshop presentations are available at a cost of $50.00 from info@canbio.ca .

There is interest in restarting the production of woodchips in PEI after a hiatus of 7 years. The only market at this time is the district heating system in Charlottetown operated by PEI Energy Systems. The system heats over 100 large buildings with a network of over 14 kilometers of buried hot water distribution lines. The plant burns millwaste and garbage, but needs woodchips to displace oil over the winter months.

The forest operating season on PEI has been a challenging one with difficulties in the marketing of hardwoods. Being at the end of the supply chain for pulp, PEI is vulnerable to any market disruptions. The closure of an Abitibi pulp mill in Newfoundland cut off 1 of 2 pulpwood export operations and led to a significant drop in the price for pulp to Island producers. The end of the strike at the UPM Kymmene mills in Miramichi and the pending reopening of the hardwood mill at St. Anne Nakawic, New Brunswick offer the hope of some improvement in regional pulp markets.

The PEI forest industry has dipped its toe in the certification process with the offering of a Forest Worker Training Program sponsored by the PEI Forest Improvement Association. The course was attended by 19 Island contractors. The course was delivered by Glen Keays of Birchwood Environmental and it is endorsed by the New Brunswick Sustainable Forestry Initiative Implementation Committee. The Implementation Committee has also hired Woodlot Stewards Co-op Ltd., a landowner co-operative with 75 members, to do site inspections of harvest sites of the 15 largest contractors on PEI. These reports will be accumulated into a collective report to the committee.

The PEI Department of Environment, Energy and Forestry released a report on PEI forest policy entitled “Woodlands Hold the Island Together” in May. The report was prepared by the Public Forest Council and it followed a series of public meetings which were well attended, especially by people from the PEI “green” community. The Department has set up a number of internal committees to review the report’s 20 recommendations and it proposes to have a discussion paper out by the end of the year for input over the winter months.

Bruce McCallum is a bioenergy and small scale forestry consultant and the principal of Ensight Consulting. He is also a woodlot owner and the manager of Woodlot Stewards Co-op Ltd., a landowner forest management company based in Hunter River, PEI. He is the President of CANBIO, the Canadian Bioenergy Association, and can be reached at canbio@isn.net

by Gaston Damecour

Mechanical Pre-Commercial Thinning

Mechanical pre-commercial thinning (PCT) in remote and high-stem count, or wall-to-wall sites is now 4 years old. The effectiveness of this approach and lessons to be learned are emerging.

According to Roland Roy, a forest engineer (B.Sc. F.E.), former silvicultural contractor and former president of the New Brunswick Silvicultural Contractor's Association, the use of mechanical PCT is here to stay, if we are to rely on PCT to meet our silvicultural objectives. The rhetoric of the last 20 months suggests that we will meet those objectives.

Mechanical PCT is currently being used only in high-density sites. We expect that we will see it used on average sites, as the application matures, to reduce reliance on conventional (manual) PCT operators.

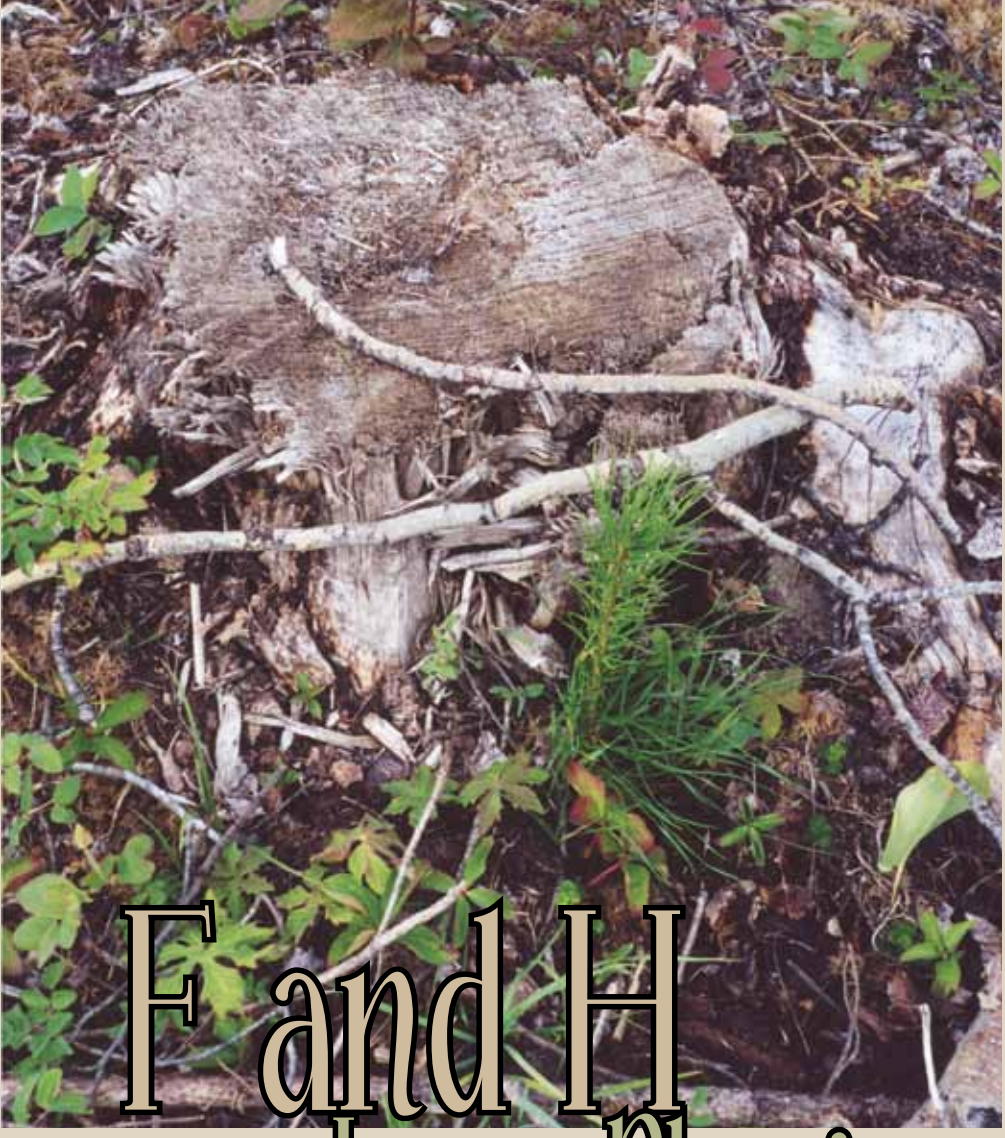
Some of the quality issues raised are both silvicultural and health and safety-related. Quality is a function of speed and density just like a lawnmower. If density increases and speed is not decreased accordingly, we end up with uncut, poorly mulched stems that can look like a bed of spears. The danger these stems represent is obvious, and they are likely to remain a hazard for some time. The mechanical PCT should aim to meet the same short stump specifications as the conventional PCT, even if the severe mulching has removed any hope for stem survival.

In addition to the speed/density issue, which is operator-related, two other technical factors contribute to poor quality mulching: the rigid one-piece drum, and the machine's inability to lower the cutting head below track level when overcoming an obstacle or mound. Both issues are technical and can be overcome through better design.

Just like a lawn mower or any other cutting device, tool sharpness is important. These are powerful machines and rocks can do serious damage to cutting tools. Some units have tools welded to the drum, others have them bolted on. Once a tool is dull, the cutting efficiency drops. The repair to the welded unit involves a grinder and costly time away from production. The bolted-on cutting tools should be changed along with regular maintenance to the unit.

The advantage of the mechanical PCT to the conventional operator is the improved opportunity for directional felling in high-density stands. The technology is already at work in the forest and it will evolve.

Gaston Damecour is a registered professional forester in New Brunswick and Nova Scotia. He is the senior consultant and principal of AGFOR Inc., based in Fredericton, New Brunswick. AGFOR has been instrumental in bringing about significant changes in the forest sector by representing governments and industries on such issues as health and safety, standards for forestry equipment, industrial relations, wood allocations and forest management policy.



F and H Layer Planting

by Peter Salonius

Where

Ten years ago, foresters were independently developing ecosystems, site and microsite tree-planting variations that recognized forest floor values, in spite of BCMOF guidelines that considered rotted wood or the organic forest floor to be inappropriate. This practice spread as "improperly planted seedlings" that started life in the warm, nutrient-rich F and H layers were observed to outperform the ones planted in cold, nutrient-poor mineral soils. In 1995, it was recommended that the placement of seedling roots be at the interface between the bottom of the organic soil horizon and the top of the underlying mineral soil, where there was ready access to nutrient-rich humus and a consistent supply of capillary-conducted water from the deeper soil. In the dry areas of interior BC and much of the rest of Canada, where the start of the planting season and hot, dry weather can occur simultaneously, this recommendation is still appropriate.

Planting in Western BC can be done in the F and H layers during wet winter weather, when drought is not usually a problem, as planted seedling roots are colonizing the planting site. Although risk-adverse foresters are satisfied with the slower growth of seedlings with all of their roots in colder mineral soil, more adventuresome types are impressed with the lower cost and more rapid growth rates associated with F and H layer planting, even though the occasional site will require replanting due to unusual droughts.

Northern and high altitude sites in BC are characterized by short seasons and considerable depths of surface organic insulation that keep the mineral soil very cold. Screefing down to plant in mineral soil can create cold air wells in which planted seedlings grow very slowly. In these situations, planting into the warmer, nutrient-rich F and H layers has produced superior growth rates.

How

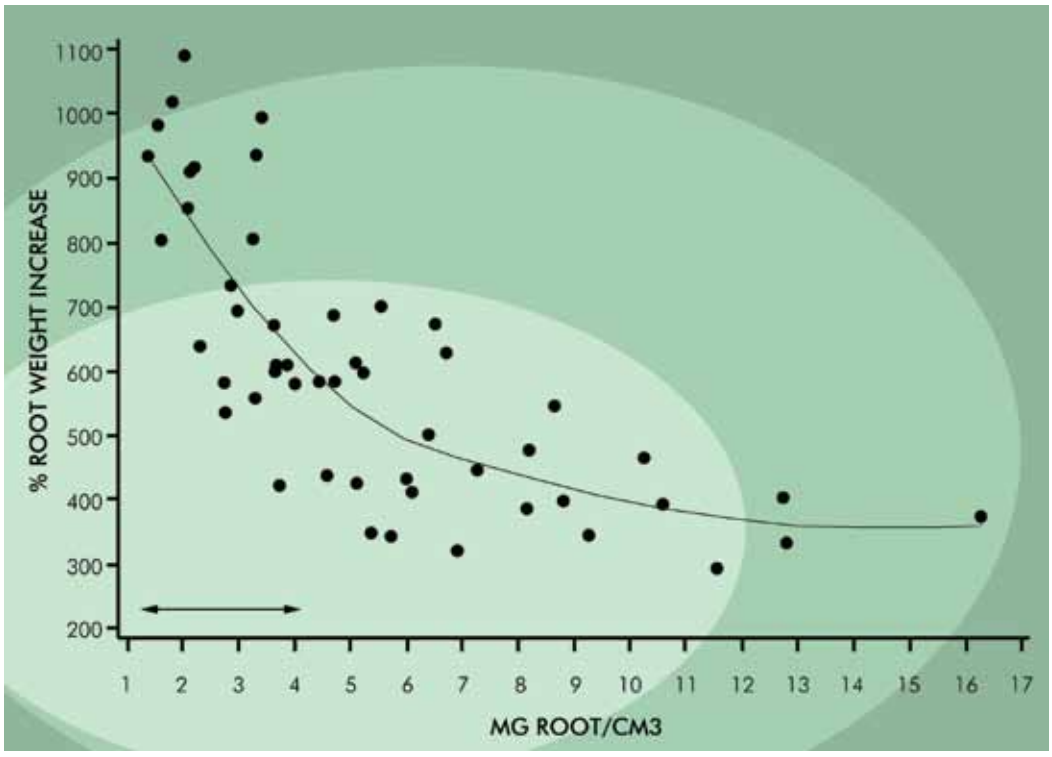
Ten years ago container growing systems were recommended that provided active roots at all levels of the soil plug, so that root growth could freely explore organic and mineral soil horizons in any direction. Bottom-drained solid wall containers unnaturally concentrate the growing root tips of seedlings at the lowest and coldest location in the planting hole. These root-form deformities, that may take years to overcome, can cause slow growth and poor survival. Spruce was often planted deeper than the nursery-established root collar to allow the eventual production of adventitious roots, with natural form on the lower stem, so that trees were not prone to toppling. Recent research has shown that seedlings, which were held in container systems of all types past the time when their roots were juvenile and vigorous, seriously under-performed in comparison with seedlings whose nursery residence was much shorter. As root density (mg root/cubic cm) in plugs increased, when seedling roots were subjected to extended life in small containers in order to achieve stock size specifications, root growth after planting decreased (see graph). The root densities of soil plugs in solid wall container systems must be greater than 4 mg/cubic cm, in order to avoid disintegration when they are removed from the growing cells at the time of planting.

What

Dennis Lavender's article in the summer 2005 issue of Canadian Silviculture, concerning the stresses that the existing forest will encounter during the next rotation as the climate warms, sets the stage for a serious rethinking about the species and genotypes that we should be planting. The inclusion of species from life zones to the south and genotypes of resident species collected from warmer growing areas in the current planting mix would mitigate the possible collapse of future forests.

Why

Is the current level of planting justified? Sites are planted that would have regenerated naturally after harvest in order to ensure the species mix that is demanded by present markets. We continue to create very large canopy openings, devoid of the seed trees that could have provided inexpensive natural regeneration. As we enter the decline half of the 200-year long non-renewable (fossil and nuclear)



energy availability interval during the next forest rotation, we should expect the customer base for conventional forest commodities to shrink numerically, and become much less affluent. The energy-driven population growth and economic expansion that have supported our lumber, pulp and paper exports will slowly wane as exhaustible supplies become much more expensive and ultimately cease to be available. If Canadian wood is to be increasingly valued as biomass for cogeneration of heat and electricity, and also as a source of the chemicals and liquid fuels we are accustomed to making from petroleum, then wood from all tree species will be acceptable as a source of biomass. In anticipation of increased demand for forest biomass and the decline of traditional commodity markets, much of the current stage management of forest regeneration dynamics may be unnecessary. Forest harvesting may increasingly be channeled toward the emulation of natural disturbance patterns, and silvicultural activities may increasingly be directed toward the encouragement of natural regeneration, as opposed to the manipulation of the species assemblage to produce specific products for commodity markets.

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Focus on Safety

by Joachim Graber

Supervision - The Key to Forest Safety

The success of a system is typically dictated by the effectiveness of the four E's – Evaluation, Engineering, Education, and Enforcing. This holds true for a silviculture company's operation, including the impact it has on its safety record. By applying the activities in an iterative fashion, one ends up with a continuous improvement system of management.

The operations of a company with respect to a work contract would include evaluating what needs to be done to meet contractual obligations, designing or engineering the method of tackling the project, educating those who will be carrying out the project, and enforcing the methods and standards of the activities, which are required to complete the work.

The supervisor's role is initially that of educating the workers in the work plan and enforcing the adherence to it. In order to accomplish this effectively, the supervisor must be trained and experienced in a variety of skills, many of which may not be thought to be associated with workplace safety. However, the importance of understanding how worker behaviour influences safety performance cannot be underestimated.

The consensus among safety professionals is that upwards of 90% of accidents occurring in the workplace may be attributed to behavioural factors. A more important conjecture is that by increasing concentration and effort placed on the influence of human behaviour, accidents and injuries can be significantly reduced in the workplace.

Factors most consistently associated with job related injuries include: environment, mood among workers, employee selection practice, types of work procedures, role clarity, job satisfaction, and stress. Simply put, satisfied workers are more frequently safer workers than those who are not satisfied.

The Western Silviculture Contractors' Association in conjunction with the BC Forestry Safety Council has embarked on its BC Safe Silviculture Project to reduce the incidence of workplace injuries. Major emphasis is being placed on training and certifying silviculture field supervisors.

For instance, the results of the recent WSCA supported survey of workers in tree planting operations, which was reported in the Spring 2005 issue of *Canadian Silviculture*, showed supervisors:

- must better communicate the importance of avoiding unsafe behaviour
- effectively communicate the way in which unsafe behaviour will be treated and follow through on them, and
- inform planters of their duty to report unsafe behaviour since health and safety is a shared responsibility in the workplace.

Such recommended actions by supervisors are the minimum standards suggested in typical one or two day workshops in managing for safety. However, to be more effective, the workplace culture must embody worker satisfaction. Thus, a much broader and detailed program must be developed to ensure supervisors have the required tools.

Following are some of the knowledge and skills a supervisor must know.

People management

- able to coach, counsel, and motivate
- have good interpersonal communication skills
- recognize and resolve conflicts
- develop effective teams
- train on the job

Process management

- ensure a performance standard is met
- plan and schedule work
- solve problems and make effective decisions

Legal considerations

- understand the concept of due diligence and apply it
- know and understand applicable OH & S regulations
- know and understand employment standards

Safety Control

- conduct safety inspections to identify hazards
- determine risk
- conduct incident investigations
- understand the company safety plan
- implement safe work practices

Courses for supervisors are universally available. However, while there are many common elements in such courses, each industrial sector is best served by training specific to its needs, otherwise only a few of the skills learned will typically be applied in the workplace by the participants.

Supervisor skills training varies considerably in length. For instance, the BC WCB has a one-day Supervisor Safety Management course in its WorkSafe series of courses. This covers due diligence, WCB officer functions, risk assessment and control, effective crew talks, and safety inspection. The BC Safety Council has a four-day Supervisory Skills Training Program which includes responsibilities and due diligence, effective supervision for safety, quality and production, and safety leadership. The Ontario Forestry Safe Workplace Association provides a Forestry OHS Leadership Accreditation Program, which includes a five-day Health and Leadership component plus a six-day Performance Management Leadership component.

The WSCA has been reviewing training programs and is developing a program, which will lead to the certification of silviculture field supervisors. The result will be that more supervisors will understand that it is not what they say that will matter to workers, it is what they do that communicates how important worker safety is to the organization.

Joachim Graber is a safety advisor and trainer and can be reached at safety@jokat.ca.

FREE GROWING TRANSFERS

by John McLarnon

In BC, beginning in 1987, the legal requirement to establish a free growing stand was established as an absolute obligation tied to the holder (the harvester) of the free growing obligation. In 1994, the government introduced a provision enabling the transfer of free growing obligations from certain categories of non-replaceable licence holders to government. This decision was based on the recognition that the primary interest of many holders of non-replaceable licences was the harvesting. Often these licensees do not have the expertise or interest in managing free growing obligations, the timeframe for which often ran many years beyond the term of their harvesting licence. In these transfers of free growing obligations, the total cost of establishing the free growing stand is estimated at the completion of harvest. The licence holder pays the government the full estimated cost and the free growing obligation transfers to government. The funds are retained in a special account and are made available as required over time to the Ministry of Forest and Range (MoFR) district managers responsible for those transferred free growing obligations. The agreed amount of payment is binding on both parties.

Beginning in 2000, a number of factors led to the government's consideration to expand the transferability of free growing obligations. These factors included reduced MoFR district capacity to manage transfers from non-replaceable tenures at the same time that a large number of non-replaceable tenures were being issued for salvage of mountain pine beetle killed timber, the need to create a process for retiring woodlot owners as well as expressions of interest by both industry and silviculture contractors of the potential benefits of transferability. In the same time period, although unrelated, the provincial government introduced a provision whereby government must fund or provide relief to the holder of a free growing obligation if fire or dothistroma damages a plantation prior to free growing and results in a significant expense. This reduced a portion of the risk element associated with free growing obligations.

In December 2002, the government introduced a provision whereby a person may transfer their free growing obligation to another person. A person includes silviculture consultants and contractors, thus creating the opportunity for the silviculture contracting community to directly participate in the business of managing free growing obligations. The process requires that the transferor and transferee must first negotiate a contractual agreement outlining the conditions of the transfer. The two parties then present the written agreement to the district manager with a request for approval to transfer the free growing obligation. The district manager must approve the written agreement and may also set a security requirement. In the case of transfers to persons who do not hold harvesting agreements under the Forest Act, the security requirement that must be posted by the transferee is 100% of the estimated cost of free growing. However, the transferee negotiates a release schedule so that these funds become available to the transferee over time as they demonstrate completion of milestones.

Once a transfer is approved by the district

manager, the transferor no longer has any legal obligation. The transferee assumes full responsibility for the free growing obligation and all of the associated legal requirements as with any other holder of a free growing obligation.

Although the transferee can be a siviculture contractor, the relationship between the government and the transferee is not contractual. The transferee is now the holder of the free growing obligation and is legally responsible for achieving the regeneration date requirement, complying with seed use requirements, completing surveys, fulfilling all legal electronic reporting requirements to government, and ultimately establishing a free growing stand, which could be as long as 20 years from the initial transfer at the time of harvesting. In the event of non-compliance, the transferee may be subject to remediation orders or financial penalties and could also be subject to Forest Practices Board audits and special investigations. The transferee does have comparable rights to other categories of holders of free growing obligations amending free growing stocking standards where an appropriate rationale exists. The transferee can also apply for funding or relief in the event of an eligible damaging event and is eligible for the same provisions of limitations of liability as other holders of free growing obligations.

The expectations of government in moving forward on this initiative is that there will be a high probability of successful outcome (i.e. achievement of free growing stands), no significant increase in risk to public interest, and a minimal increase in administrative burden on government staff. Interest was high during the discussions leading up to the introduction of the provision. Subsequent to its introduction, actual usage has been minimal.

One compelling vision of the benefits of expanded transferability is that it may lead to the creation of a silviculture market for free growing obligations. This may catalyze the emergence of a new era of innovation. Holders of free growing obligations who choose to transfer their liability will be able to focus on their core business of managing the harvesting and marketing of timber from Crown forests, with the assurance of known costs to meet the free growing requirement. At the same time, an industry specialized in managing free growing obligations would emerge. The first transfer of free growing obligations to a silviculture contractor was recently completed. It remains to be seen how extensively this provision will be utilized.

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