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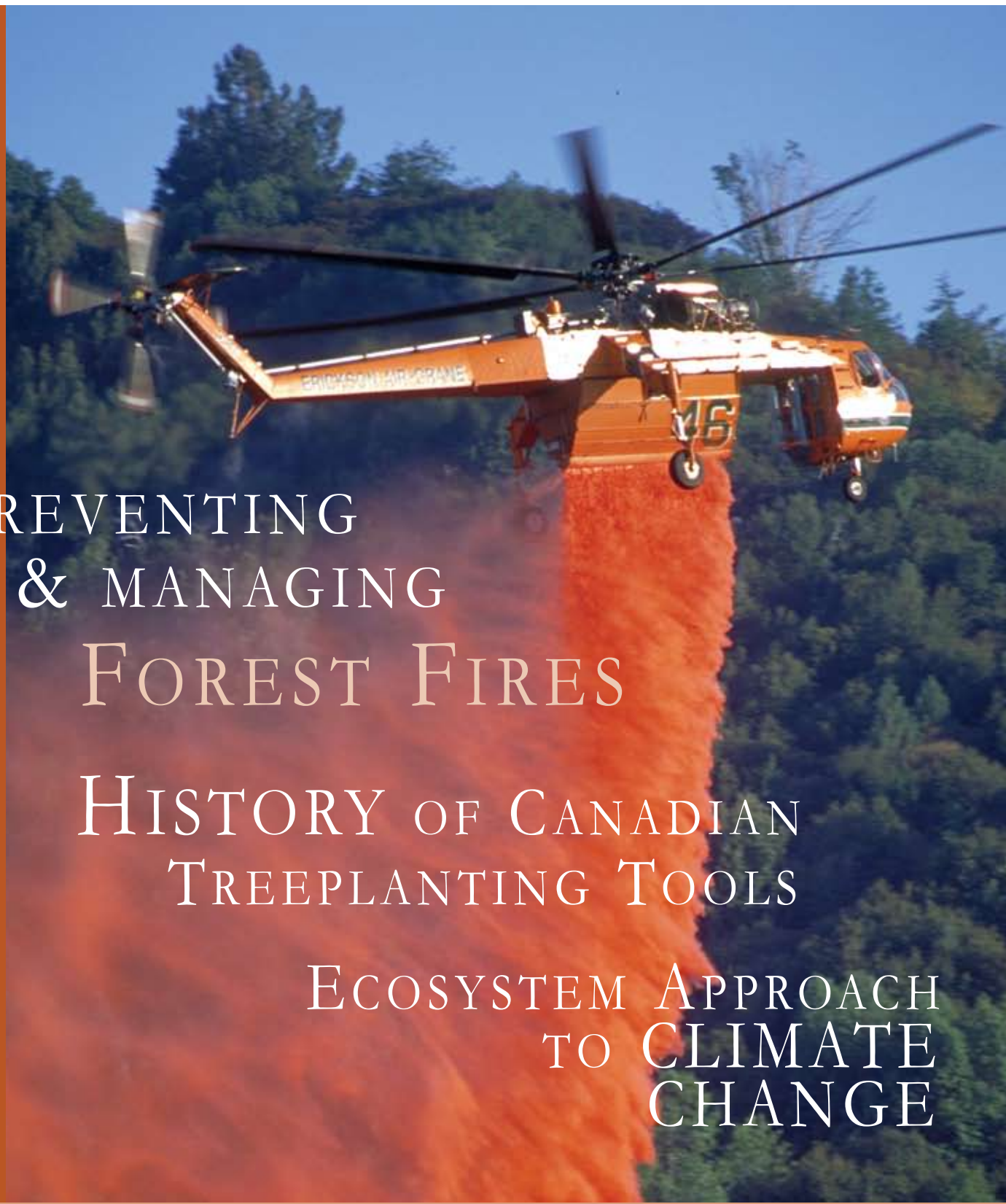
SILVICULTURE
SUMMER 2004



Preventing & managing Forest Fires

History of Canadian Treeplanting Tools

Ecosystem Approach to Climate Change

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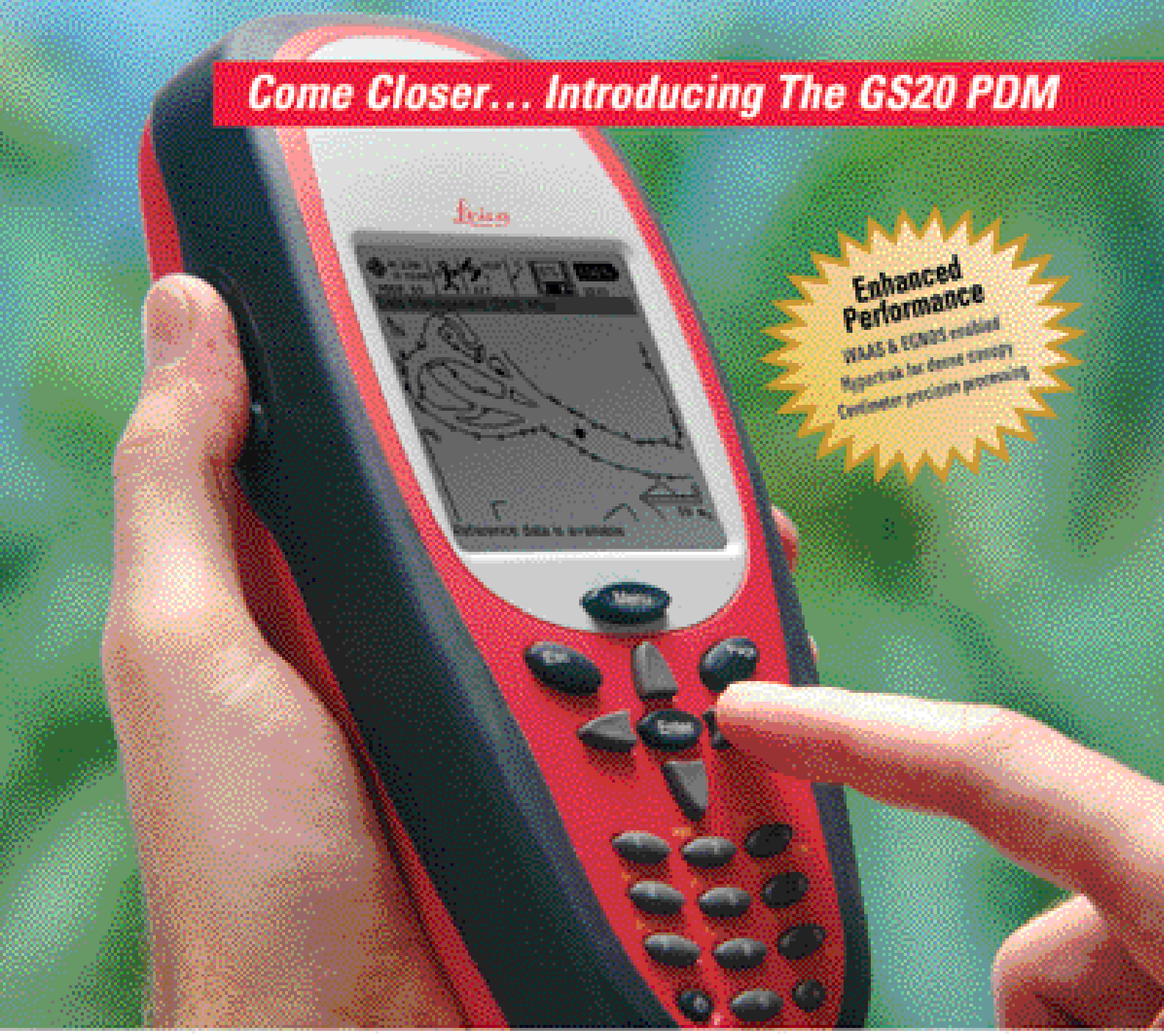

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Canadian Silviculture is published four times a year by EMC Executive Marketing Consultants Inc., 6058 187A Street, Surrey, BC V3S 7R6.
Phone 604-574-4577 Fax 604-574-2196
Email silviculture@emcmarketing.com

Subscription rates: 4 issues per year - $30.00 & GST
PUBLICATIONS MAIL AGREEMENT NO. 40026059
RETURN UNDELIVERABLE CANADIAN ADDRESSES TO
CIRCULATION DEPT EMC PUBLICATIONS
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by Dirk Brinkman

Reforest what you reap

The BC Ministry of Forests (BCMOF) recently adopted a new performance reporting measure in their Service Plan as a part of ensuring that the use of the forests to generate economic benefits is balanced with the long-term health of the forest and range resources.

This is called an indicator of Sustainable Timber Productivity which is measured by the Ratio of area reforested to area harvested, or areas of unsalvageable fire and pest losses, calculated on a 5-year rolling average. A what? A ratio of reforestation to deforestation calculated based on the past five years. Averaging over five years gets rid of peaks and spreads response programs reasonably.

It is one of the indicators that the province is keeping up with its commitment to the National Forest Strategy 2003-2008, also signed this year. Under the commitment to theme one - Ecosystem Based Management - the NFS includes the following action item:

1.5 Reforest areas that are cut for temporary uses and use afforestation, where feasible, to mitigate the permanent loss of forest.

The BCMOF reports that in 2000 the ratio was 1.2. In other words, over the past five years, on average, 20% more area was being reforested than was being deforested. However, in 2001, it dropped by 27% to 0.93 by losing a peak year like 1996, and adding a problem year like 2001. In 2002, it fell further to 0.82. Despite the reporting deadlines, data is not in for 2003. With 255,000 hectares burned and many more lost to pine bark beetles, in 2003, this indicator is going to be difficult to report without a clearly committed plan.

But that is what is good about an indicator. Every year BC is below 1, it is adding to its Not Sufficiently Restocked area (NSR). This simple indicator tells the public whether or not the growing capital in the working forest ecosystem is being replaced wherever it has been removed. If BC is not replacing its capital depletions, the sustainable harvest will decline.

How does this formula drive action?

The area reforested includes planting and natural regeneration and is net of reforestation failures. Harvesting is by any method and includes for any purpose. Losses to fire and pest are only the unsalvageable as the salvageable will be reforested under law.

The ratio of area harvested to area reforested by the timber industry, as reported by the Forest Practices Board province wide audit in 2002, is a great success being in balance or a perfect **1.** The BCMOF did not report on the harvest by oil and gas industry for the temporary use of seismic lines and well sites. This industrial use without reforestation needs to be redressed to restore sustainability in the harvest/reforestation balance.

The ratio being greater than 1, from 1993 to 1999, reflected a focus on backlog reforestation in the NSR. The cost-sharing programs with the Federal Government under Forest Resource Development Agreements and with (a reluctant) industry through Forest Renewal BC has been replaced by a Forest Investment Account (FIA).

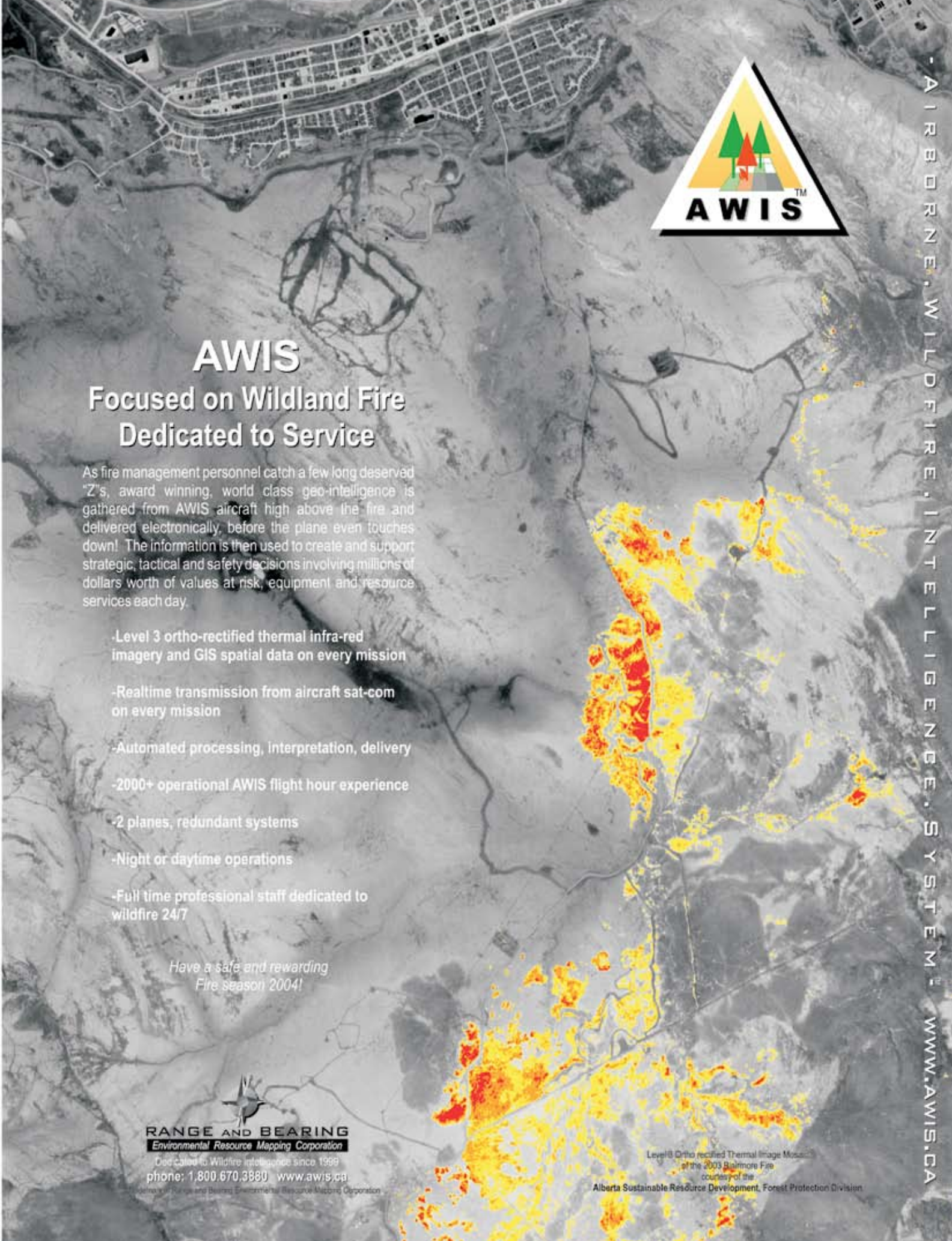
However, insufficient or uncertain year-to-year funding has resulted in industry focusing on other priorities. Reforestation and tending of backlog and current fire and pest areas are at their lowest levels in 20 years. These statistics do not include areas denuded by the summer of 2003 fires.

Clearly the biggest challenge is going to be for the BCMOF to develop a strategy to address reforestation on areas lost to fire and pests. To keep pace with the rolling average of the area lost to fire would have taken reforesting an additional 20,471 hectares, using the 2003/04 average. The exceptionally severe 2003 fire season, which burned 255,000 hectares, might double that average. There is no number yet for the rolling average for areas that are not being salvaged lost to pests and disease.

The magnitude of these two combined obligations will require the government to establish a special account, much larger than the whelp of FRBC or FIA. The WSCA has proposed BC develop a catastrophic carbon account with the federal government, and use the measurable mitigation of carbon emissions through reforestation, salvage and conversion to fund a special program for both extreme fire and pest events. Work on that front is now urgent.

When governments introduce self-monitoring accountability measures, we should applaud. BC's commitment is implicit in proposing a simple indicator. The ratio of area reforested to area deforested is simple. Simple criteria have the potential to provide clear direction which the public can get behind. Public support will be needed to enable all stakeholders to overcome the obstacles to sustaining the forest ecosystem capital.

To engage the public requires the silviculture industry to understand and engage with this ratio and communicate the challenges of reversing BC's slide into eroding its working forest capital. The forest is counting on you.



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Level 3 Ortho rectified Thermal Image Mosaic of the 2003 Blairmore Fire courtesy of the Alberta Sustainable Resource Development, Forest Protection Division

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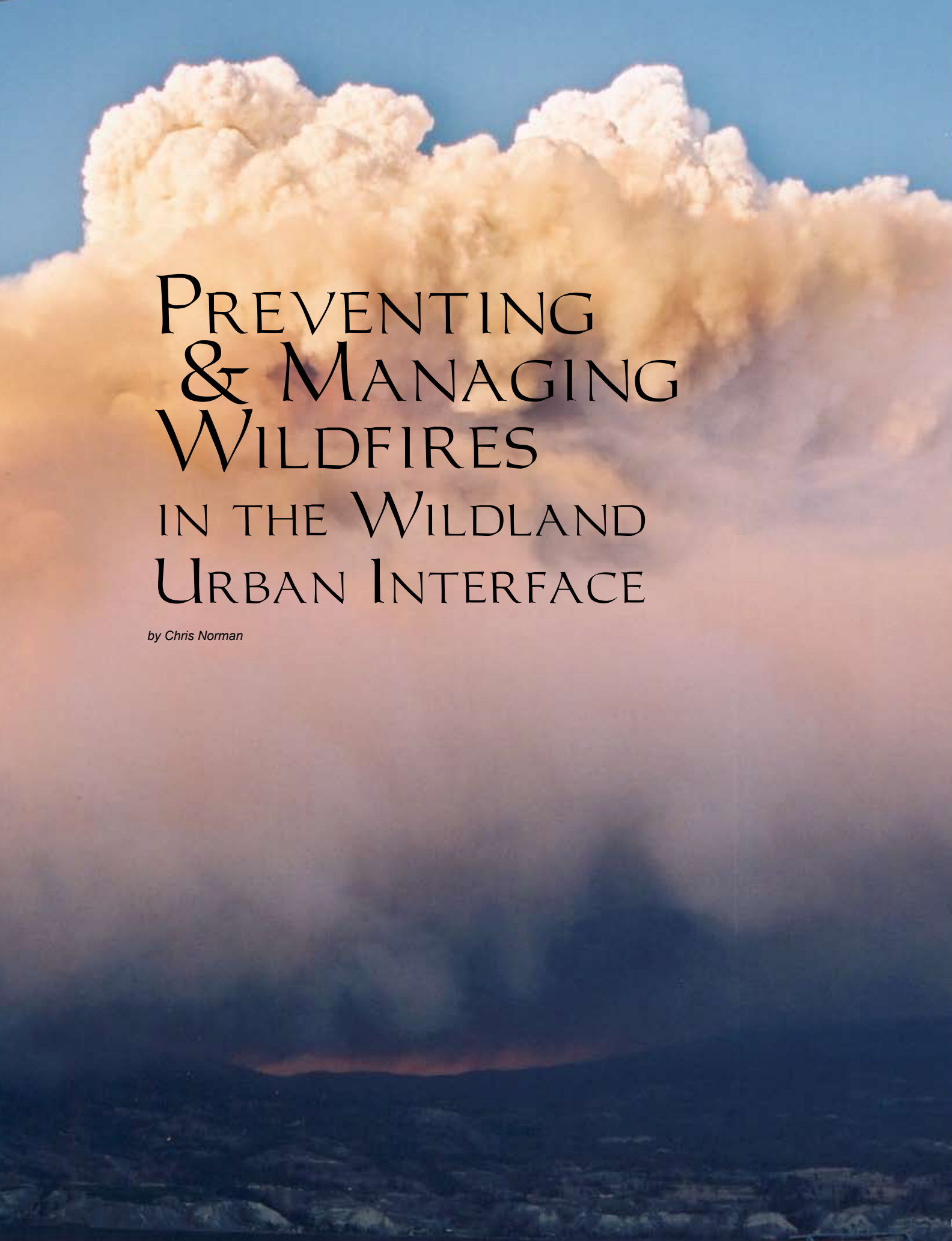

Preventing & Managing Wildfires in the Wildland Urban Interface

by Chris Norman

In 2003, BC suffered the worst fire season on record for decades with over 30,000 evacuated and the loss of businesses, hundreds of homes, and firefighters' lives. As a result, the province mandated the Honourable Gary Filmon, former premier of Manitoba, to review BC's 2003 experience. His 'Firestorm 2003' report emphasized that efforts be directed to improved preparedness, fuel management, emergency management, training and education.

The report sites several factors that have lead to increased risk and severity of fire: changes in the forest structure and density due to decades of fire suppression, more homes in forest areas, and a trend towards warmer and dryer summers due to climate change. Provincial firefighters, municipalities and homeowners now need to account for these heightened wildfire risks in their preparations. Municipalities must ensure that their structural firefighters are trained and equipped appropriately to deal with fires in the wildland urban interface (WUI) as well as the traditional structural fires. It is also important that firefighters are equipped with appropriate trucks to venture onto the wildland. 4x4 trucks with a high clearance or skidders with a tank would be good vehicles to tackle wildfires. Clothing must also be geared towards protecting people from the intensity of wildfire while keeping them comfortable as they spend long days battling fires. Communities and homeowners should make use of WUI planning and education tools such as the FireSmart program developed by Partners in Protection, an Alberta based coalition of agencies. Rick Arthur, President of Partners in Protection, reports that the program has now been adopted by many communities across Canada providing clear guidelines and practical tools to create wildfire safe communities.

A controversial concept is being promoted by John Gledhill of the Tasmania Fire Service. Citing the fact that most deaths and injuries related to wildfire are caused during the evacuation process rather than from the fire, Tasmania and some other provinces in Australia have adopted a program called "Prepare, Stay and Survive" where homeowners are encouraged to create a defensible space around their residences to reduce

Spot ignition

ground fuels, to stay at home during a wildfire incident, and to be active in protecting their properties. Airborne embers are a big source of ignition, and by staying home, homeowners are able to extinguish embers and small hot spots and go into their homes to protect themselves from the radiant heat as the fire gets closer. Gledhill suggests that most homes don't ignite during the "burn-over", but often burn due to eventual ember build-up, and the home is a safe location during the intense part of the fire, if the appropriate prevention measures have been taken. The key here is preparation, both for the land around the building and the building material itself. As an example, it is illegal to have easily ignitable roofing materials. Also, given the importance of information, Australia utilizes a web site for both the public and the media for up-to-date details on the size and direction of the fire. The "Prepare, Stay and Survive" strategy has reduced fatalities and home losses in Australia.

Prescribed fire, once a regular occurrence in BC, and an economical treatment for fuels reduction, lost favour in the 90's due to the negative social impacts of the smoke. The FireStorm 2003 report recommends a return to the increased use of prescribed burns and this has been echoed by the BC Minister of Forests. Mark Finney, with the USDA Forest Service, describes that prescribed burns in the US act as a fire break causing a crown fire to return to the ground, where it is less intense and firefighters have a chance to suppress the fire.

In overly dense forests, prescribed burns often require commercial thinning and removal of most of the thinned wood prior to burning, unless a complete burn of the forest is desired. Otherwise there is a significant risk the burn will be too hot and will damage the remaining trees. The thinning generates merchantable timber, and often a lot of non-merchantable timber. It is questionable whether large scale prescribed burning will ever be acceptable or possible and transporting large volumes of non-merchantable timber off-site is the only opportunity for fuels reduction. Therefore, re-thinking is required to determine what to do with the non-merchantable material, whether it means creating innovative uses such as new round-wood building systems, on-site chipping for pulp, or generating energy; all of which require significant infrastructure development, involve economic challenges, and will take time to implement on a significant scale.

Greg Anderson with the BC Ministry of Forests in Cranbrook has conducted cost comparisons of various fuel management strategies in the Rocky Mountain Trench. Costs ranged from large scale prescribed burning at $29/ha up to $500/ha for spacing and loading into sloops, which leaves no residual.

Recently thinned and burned stand

Anderson suggests reducing density to less than 75 stems/ha in the open range and to approximately 150 stems/ha in the open forest. Experiences in Alberta's pilot program generated far higher costs, from $800 per hectare to over $3000 per hectare.

Fuel reduction treatments

Select harvesting and prescribed burning have even received the endorsement of various environmental groups, including being used in parks. Jasper National Park has been undergoing fuel management for 10 years, balancing the needs for ecosystems, habitat and wildlife. Al Westhaver at Parks Canada explained that they engage a combination of contractors, First Nations, and community volunteers to do the work, thereby gaining public acceptance for the treatment. Although we can try to prevent fires, they will still occur and

timely information

helps firefighters decide on resource allocation, deployment and release

need to be supressed. Tools for fire suppression range from dozers on the ground to flying tankers in the air. Dozers equipped with waters tanks, foam injectors and pumps can construct firelines, hold those completed lines and mop up.

Waterbombers can scoop up water from oceans or lakes in 25 seconds, at a rate in excess of a ton per second. Foam concentrate is injected into the water load and it remains inert until the load is dropped. The action of dropping the water converts the water into foam.

Helicopters provide an alternative to flying tankers. Tanks can be filled in 40 seconds using a snorkel suspended below the helicopter. Water sources can be as shallow as 45 cm. so they present a good option to use in areas where there isn't a large water supply. The tank system is designed for use with water, class "A" foams or long-term retardant.

Fire mapping systems give firefighters critical information to predict fire patterns. Radiometric mapping plots heat intensities as well as fire perimeters. Thermal imaging can detect and classify hotspots by location, size and shape. Spacial analysis can show the leading edge of a fire and determine the direction of spread. This timely information helps firefighters decide on resource allocation, deployment and release.

Wildfires play a necessary role in the forests. Although we can try to prevent the severity of fires, they are inevitable, and with hot, dry summers they will continue to threaten forests and neighbouring communities. Given our intervention in the structure of the forest, and changes in climate, we now have the responsibility of managing the fires that will result. The choices before us are to take preventative action at the community and forest management level, or to continue to invest the majority of our dollars in the reactive processes of fire fighting infrastructure and personnel.

Information in this article was collected at the 2004 Wildfire conference hosted by the Western Silvicultural Contractors Association. Thanks to Bruce Blackwell at B.A. Blackwell & Associates for contributing to this article. Photos in this article supplied by Bob Gray of RW Gray Consulting Ltd.

FOCUS ON SAFETY

by Joachim Graber

"Tree planters are not property," says Colin James, "and companies have an obligation to make sure their workers are returned safely to their families when the season ends."

In an impassioned speech to the Western Silviculture Contractors' Association (WSCA) in February, the self-described family man said contractors need to change the culture in the sector, especially as it relates to the safety of its young employees. His daughter, 20-year-old Julia James, died in May 2003 in an automobile accident near their planting camp. A first-year tree planter, Julia was in the back of a Ford Excursion that plunged into a lake near Quesnel. Although the driver and another passenger escaped the truck, Julia was trapped in the truck and drowned. A fellow tree planter, 21-year-old Trevor Wishart of Oliver, eventually pleaded guilty to impaired driving causing death and was sentenced to four years in prison.

But Colin James argues that it's overly simplistic to think that it was only the action of one man that caused the death of his daughter. "There are those that might think that Julia died because one person made a huge mistake, made a terrible and impaired choice," Colin told the WSCA convention. "Trevor Wishart did all of that and now he languishes, potentially for the next four years, in a federal penitentiary. But Trevor was only one of the ducks in a line that day."

It's a given that good leadership is crucial to an effective workplace. That's magnified in a camp environment; workers are together 24 hours a day and the lines between the workplace and the home are blurred. The camps are effectively small, mobile villages with many of the leadership needs of a village.

The makeup of that 'village' adds another dimension to the need for leadership. Although some camps, with a longer planting season, have veteran planters who return year after year, the majority of tree planters tend to be young, relatively inexperienced, and have not lived on their own for many years.

Of the approximately 6,000 tree planters working in BC's bush this year, roughly 1,200 to 1,500 are veterans in the 30 to 45 age range, estimates WSCA Executive Director John Betts. Betts agrees that leadership is a key issue to ensuring safety of workers, "These kids need a little bit of mentorship and support because they are often uncertain of themselves."

Betts explains that support may simply mean encouraging planters to keep in regular contact with their families. In 2002, Alberta native Nicole Hoar went missing after leaving a planters' camp near Prince George. She was last seen June 21, 2002, but was not actually reported missing until July 2, after failing to show up for work six days earlier.

It's not all bad news for safety in the silviculture sector. The Forest Industry Safety Association (FISA), which has a working agreement with the WSCA, is delivering courses specifically targeted to silviculture workers and supervisors. Betts says, "Overall the industry is doing a pretty good job on the safety front, and it's only a few contractors having problems." The major injuries and deaths are happening away from the actual tree planting work. The latest incident saw seven tree planters near Jasper, Alberta, hospitalized after the bus they were riding in went into the ditch and rolled. The 20-year-old driver is also being charged. Due to the number of transportation and vehicle related accidents, FISA is developing an ATV operating course and an off-highway driving course.

Betts echoes Colin James' sentiments about the treatment of young workers and sending them home safe to their families, "We don't own or rent our employees, we borrow them from their families."

Joachim Graber is Manager of Training & Development at FISA - Forest Industry Safety Association in Prince George, BC. He can be contacted at 250-562-3215 or jo@forestsafe.ca or visit www.forestsafe.ca

DISTURBANCES CONTRIBUTING TO WILDFIRE

by Janice Hodge

Interior forested ecosystems of British Columbia support a number of forest health factors (FHF), both biotic and abiotic. These disturbance factors are integral components of forested ecosystems that contribute to both stand and landscape level diversity. From a timber resource viewpoint, however, they also have the ability to significantly impact social and economic expectations. Although their fundamental roles remain unaltered since historic times, the frequency, extent, or synchronicity of outbreaks may have changed. As disturbance agents, they promote changes in species composition and structure, patch size distribution, snags, coarse woody debris, shrubs and forage. Their spatial and temporal scales, and the severity of the disturbances, influences succession as well as potential fire behaviour. A combination of fire exclusion policies and selective harvesting practices have modified stand and landscape level susceptibility to a variety of FHF and thereby altered ecosystem resiliency.

Bark beetles include mountain pine beetle (IBM), Douglas-fir beetle, spruce beetle and western balsam bark beetle. Incipient stages of IBM create gaps as a result of the mortality of scattered patches of one to three attacked trees, whereas the outbreak stage is visible at a landscape level. Douglas-fir beetle is more discrete than IBM and is often found in association with windthrow, root diseases, defoliation and/or drought. Spruce beetle tends to be localized i.e. drainage, due to the distribution of the susceptible host and topography, and is also often found in association with windthrow. Western balsam bark beetle is ubiquitous throughout the range of sub-alpine fir, and therefore functions at both a patch and landscape level. Dead, standing, attacked trees or downed trees provide fuel for fires. Lodgepole pine dominated ecosystems are a result of stand replacement fires, with ample fuel likely provided by an IBM outbreak; often referred to as the fire-beetle-fire-beetle cycle.

Lodgepole pine dwarf mistletoe, larch dwarf mistletoe, and Douglas-fir dwarf mistletoe provide structural diversity and habitat for a variety of fauna. As a result of fire exclusion, dwarf mistletoes have responded by increasing in both intensity (on individual trees) and incidence across the landscape. Brooms can either act as ladder fuels or ground fuels (if broken from stem) and increase fire-crowning potential.

Western spruce budworm and Douglas fir tussock moth are the primary defoliators of dry Interior Douglas fir (IDF) forests. Uneven aged, multi-layered stands of Douglas fir are highly susceptible and will incur the greatest impacts. Fire exclusion has promoted shade tolerant species and likely reduced the distribution and incidence of fire-adapted seral species in these previously fire-maintained ecosystems. However, defoliator outbreaks may benefit some stands through a nutrient influx and reduction in stem density. Root diseases such as armillaria and laminated root disease have flourished in these replacement forests, particularly those that have been selectively harvested. Historically root diseases likely contributed to patch level diversity and were more frequent and intense in island remnants following fires.

A number of other FHF, including stem and needle diseases, stem decay, and abiotic factors such as drought or windthrow contribute to ecosystem diversity. Atypical events such as defoliation of Douglas fir by western hemlock looper has occurred in dry IDF (near Kamloops and Vernon) in the last several years. This defoliator is generally found in wetter cedar/hemlock stands. This phenomenon has not been previously observed in these ecosystems, and may be due in part to climate change.

The extent to which climate change will modify landscape level processes, including the incidence, frequency and impact of FHF will undoubtedly present challenges to forest managers. In the future, management strategies should focus on increasing resiliency of forested ecosystems while recognizing the role of FHF in ecosystem diversity. Furthermore, with heightened fuel awareness, managers will need to incorporate the susceptibility and impacts of FHF into landscape level fuel management and/or fuel models.

Janice Hodge is with JCH Forest Pest Management and can be reached at 250-547-6452.

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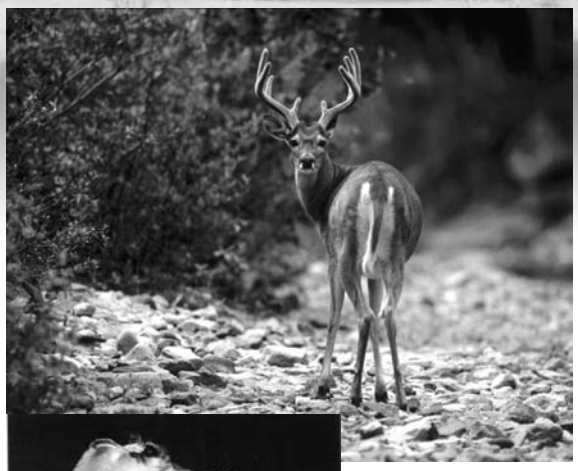
Using an **Ecosystem** Approach to Manage for Climate Change

by Paul Gray



Agriculture, urbanization, industrialization, and roads contribute to the destruction, degradation (e.g., fragmentation), and modification of forested ecosystems around the world. For example, global warming is increasing at an unprecedented rate. In Canada, mean annual temperatures have increased by 0.5°C in the last hundred years and could increase another 2-5°C in the next 50-75 years. Some implications of an altered climate to Canada's forested ecosystems include:

• Fire and drought may become more frequent and severe in some types of forest.

• Biodiversity will change:

1) Insect and/or disease outbreak patterns will often be more severe.

2) Plant species will autonomously change their distribution resulting in new types of forest. It is possible that a significant part of the boreal forest will be displaced by tree species from the south or will be converted to grassland.

3) Animal species distributions will change. For example, the White-tailed Deer, Virginia Opossum and Southern Flying Squirrel now survive hundreds of kilometres north of their once traditional range.

• Some forested ecosystems will experience enhanced growth and productivity while others will decline.

• Heavy rainfall in some areas may increase the risk of soil erosion in managed forests.

• Regenerating forests may suffer from the increase in drought conditions in some ecosystems.

• Grasses and other competing species will benefit from elevated concentrations of carbon dioxide, making it harder to establish new forests.

How can Canadians respond, particularly in view of the fact that change is inevitable? First, a commitment to care for Earth's natural assets is a critical element of any successful initiative. But implementation needs an integrated, unified, and practical plan for action. During the last 20 years, the popular and scientific literature has exploded with ideas, guidelines, and recommendations and an 'ecosystem approach to management' is often cited as a delivery technique for sustainable management.

An 'ecosystem approach to management' is based on the idea that appropriate values, combined with the required knowledge and tools, can protect and maintain ecosystems, and provide a range of benefits to society now and in the future. Asking the right questions helps organizations design the most suitable approach - questions about the spatial and temporal **context** in which to make decisions and questions that **enable** organizations to apply a suite of **tools** and **techniques** to keep the landscapes, the waterscapes, and the airscapes working. While organizations and the ecosystems for which they are responsible are different, questions can be organized according to these interrelated themes:

Context:

Space - Have we mapped and described the large, medium, and small ecosystems, and do we use this ecosystem framework to plan and manage human activities?

Time - Have we made the long-term commitment needed to care for ecosystems in the context of climate change and other impacts?

Enablers:

Philosophy and Values - Does our organizational philosophy allow us to care for all key forest ecosystem values, including maintenance and enhancement

of biodiversity, air quality, water quantity and quality, soil quality, recreation, timber, and carbon?

Corporate Structure and Function- Does our corporate structure and its functions provide a progressive and positive culture to implement an ecosystem approach? Does it eliminate the sector-oriented silo approach that impedes integrated management? Does it promote an adaptive approach to management?

Partnership - Are we involved with all the necessary partners, and do we have the tools to keep partnerships engaged and progressive?

Tools and Techniques:

Science (Data and Information Management) - Do we support and/or have access to scientifically sound data and information to allow proactive decision-making?

Education - Are we disseminating essential knowledge among our staff, partners, clients, and the public in support of decision-making and life-long learning opportunities?

Strategic Approach (Plan) - Do we have a vision and/or mission statement that describes the condition or state (of the ecosystem) to which we aspire? In other words, have we described the path we want to take?

Policy - Do we make a commitment to caring for forests with legislation, policies, regulations, and plans that address climate change in the context of an ecosystem approach to management?

On-site Actions - Are we protecting, restoring, and/or using forests in ways that keep the landscapes, waterscapes, and airscapes working?

While change in forested ecosystems is inevitable, the extent and significance of this change during the next few centuries can be positively influenced by people. For example, if countries participate in a sustained effort to reduce the use of fossil fuels, greenhouse gas emissions will decline. Instead, if countries opt for economies based on increasing fossil fuel consumption, the additional greenhouse gases in the atmosphere will trap more heat energy causing increased variability in temperature, precipitation (rain, snow, and ice), and wind patterns. The frequency and size of extreme events such as heavy rains, ice storms, tornadoes, and wildfire will also increase, and result in significant ecological, economic, social, and cultural impacts in forested ecosystems.

Canadians must prepare for and adapt to a rapidly changing ecosphere (Earth's largest ecosystem). With about 45% of its land treed, Canada is responsible for the care and management of 10% of Earth's forests and 20% of Earth's freshwater, a significant portion of which exists in forested ecosystems. But getting the questions right in the first place is a critical milestone, if organizations and individuals hope to contribute to global-local decisions about managing for climate change and forested ecosystems in the long-term. And an ecosystem approach to management can be used as a framework with which to ask the questions, define the issues, and address the risks that need to be managed in a new world climate.

Paul Gray is Coordinator of the Climate Change Program for the Ontario Ministry of Natural Resources in Peterborough, Ontario. The views expressed here are solely his own, and do not represent the policies of the Ministry of Natural Resources.

by John Betts, Executive Director

More than 200 participants attended the BC 2004 Wildfire Conference hosted by the WSCA, in Whistler, in May. The audience comprised of a cross-section of stakeholders, ranging from foresters to fire chiefs, who listened to what many described as one of the most comprehensive sessions on wildfire ever heard in the province. Some of the proceedings spread into the provincial media, with Tasmanian fire chief John Gledhill advocating his "Prepare, Stay and Defend" program which relies on threatened homeowners not evacuating, but remaining and protecting their own residences. This is a controversial suggestion given last year's events in BC. But the principle imperative in Gledhill's proposal is not the staying and defending so much as the preparing. And in some respects, that was a central theme of the conference. How can we prepare the interface and the landscape so that both human and wild habitat can live with fire? The proceedings of the conference will be made available later this year on the conference website at www.wildfireconference04.com

Wildfire is much on the minds of forestry and nursery contractors in BC and Alberta, as both provinces deal with restoring the backlog of fire damaged plantations and lands. In Alberta, between 1993 and 2002, almost two million hectares have burned; an area three times the size of Prince Edward Island. Much of this area has not been restored and the Alberta Forest Nursery Association (AFNA) estimates that this represents a $2.5 billion loss to the province's economy. The AFNA, along with other industry groups in Alberta, is lobbying the provincial government to address at least 20 per cent of the burned land through reforestation; an effort that they estimate would involve 350 million seedlings. Spread over a ten-year period, it would require $35 million annually in funding, some of which foresters were hoping to see in the provincial budget announced earlier this spring. But the sum never appeared and the lobbying continues.

In BC, there are similar concerns with the province's investments in forestry at their lowest levels in years. Funding is now through the Forest Investment Account (FIA) an annually renewed fund that replaced Forest Renewal BC. Last year's fires added considerable hectares to the burned over inventories in the province, and the FIA has scant resources to allocate to this land. Adding to the problem, each year that reforestation doesn't take place, the sites become more expensive to restore, thereby increasing the costs and further reducing the province's capacity to remedy the problem.

Occupational health and safety in the BC forest sector has begun to move on the recommendations of a task force report released earlier this year. A BC Safety Council will be established, comprised of industry associations from around the province including the WSCA. The council's main mandate will be to implement the Forest Safety Task Force's 20 recommendations designed to reduce fatalities and severe injuries in the province's forests. Some of the key recommendations include certification of certain forest occupations, pre-qualification in order to bid on forestry contracts and rate incentives for companies with good safety records. These conditions will likely affect how silvicultural work is carried on in the province.

Forest Renewal Co-operative Inc.

by William F. Murphy, RPF General Manager

There is a new organization in Northwestern Ontario that is for the benefit of the smaller forestry contractor, forestry companies, and affiliated suppliers. The name is "Ontario Forest Business Association" (OFBA). The newly formed group held its first membership dinner meeting in June and was supported with 250 sold tickets and 133 dinner guests. Mr. Joe Commuzi, Minister of State for the Federal Government was on hand as the guest speaker. He talked about working as partners and how partnerships can benefit the forest industry as they did with the Software Lumber dispute. Ontario is reeling from the effects of the softwood lumber dispute, higher dollar value and wood supply and it is affecting all forestry businesses. There is a need for a combined voice to provide the necessary formation of partnerships and progressive thinking to keep our industry vibrant.

The Ontario Forest Business Association has a mission to promote the development, growth and communication among businesses working in partnership with government towards the viability of Ontario's forest businesses. What we are looking for is a successful and vibrant forest business community in Ontario. Our guiding principles are to support and encourage private enterprise and at the same time establish a positive working relationship with all levels of government. We want to address the problems, issues and concerns that are affecting the businesses working in the forest sector.

We are starting this out in Northwestern Ontario but it is intended to diverge into all of Ontario within the next little while. This is an opportunity for everyone to get involved. We are looking for memberships. The Working Forest is offering a $10.00 subscription to its newspaper with each new membership. Our membership price for an individual is $20.00 + $10.00 for the working forest subscription for a total of $30.00 for the first year.

For more information on membership and the direction of the OFBA, contact Brian Kurikka at Confederation College Forestry Centre at 807-475-6643.

par Fabien Simard, ing. f. Directeur général

Les travaux de la Commission d'étude sur la gestion de la forêt publique québécoise.

Le gouvernement du Québec a mis sur pied en octobre 2003 la Commission d'étude sur la gestion de la forêt publique québécoise. Cette commission scientifique, technique, publique et indépendante s'est vu confier le mandat général de dresser l'état de la situation en ce qui concerne la gestion des forêts publiques du Québec. À la fin de son mandat en décembre 2004, la Commission émettra ses recommandations au gouvernement du Québec quant à l'amélioration et à la bonification du régime forestier en matière de développement durable.

La Commission a terminé en juin sa tournée de consultations régionales et les prochains mois seront consacrés à l'analyse des propositions recueillies. Des constats généraux ressortent toutefois déjà des consultations réalisées. Tout d'abord, il est clair et net que l'ensemble des intervenants et utilisateurs de la forêt québécoise souhaitent une décentralisation vers les régions ou une régionalisation de la gestion des forêts. Entre autres, ils veulent être plus impliqués dans tous les niveaux décisionnels qui concernent directement l'industrie forestière dans leur région. Leur volonté de s'assurer que le développement des forêts respecte les problématiques régionales est bien présente. Ainsi, ils souhaitent rapprocher le citoyen du processus décisionnel. Les régions demandent de devenir les vrais gestionnaires de leur forêt en décidant notamment de la stratégie sylvicole et du niveau de l'intensification de l'aménagement. Prenons un exemple concret. Présentement, la localisation de la limite nordique est le fruit d'une décision du gouvernement du Québec qui se base sur une étude contestée par le milieu forestier. Or, une décentralisation des décisions permettrait aux régions côtoyant la limite nordique une relocalisation de cette limite nordique, par un appui sur des études scientifiques, en fonction de la limite naturelle continue.

Pour le moment, d'après les rencontres tenues entre les représentants de la Commission et ceux de l'industrie, il semble se dégager un large consensus autour de l'assouplissement des instructions relatives qui aura pour effet, à court, moyen et long terme, d'améliorer et de faciliter les conditions de travail des ouvriers sans pour autant mettre en péril le patrimoine et le rendement forestier du Québec.

Le Conseil de l'industrie forestière du Québec a proposé de mettre en place un chef forestier indépendant, relevant de l'Assemblée nationale, qui serait en charge du calcul des possibilités forestières du Québec. L'idée de la création du chef forestier neutre, transparent et apolitique a eu une oreille attentive et a plu notamment à l'Ordre des ingénieurs forestiers.

Pour sa part, l'AETSQ et ses membres ont également contribué aux travaux par le dépôt de trois mémoires devant la Commission. Deux de ces mémoires portent sur les nouvelles technologies de mécanisation dans l'éclaircie précommerciale. Ils ont été réalisés conjointement par l'Association, le Groupe Nokamic et E-Forêt. Ils dressent le portrait du problème de diminution importante de la main d'œuvre en regard de l'augmentation constante du nombre de travaux à exécuter de même que de la difficulté à intéresser la relève à ce corps d'emploi difficile et exigeant. Une des solutions à cette problématique se retrouve dans l'implantation d'une nouvelle technique d'éclaircie précommerciale effectuée à l'aide de machineries spécialisées permettant la semi-mécanisation de ce type d'activité. Selon les intervenants, l'arrivée de cette nouvelle technique a l'avantage d'améliorer considérablement les conditions de travail des ouvriers sylvicoles ce qui aura pour effet de rendre ce métier beaucoup plus attirant pour les travailleurs et la relève.

L'autre mémoire déposé par l'AETSQ, en collaboration avec Nord-Forêt cette fois, s'intéresse plutôt à « l'accréditation des compétences des entreprises sylvicoles ». L'essentiel du message livré par ce mémoire est basé sur l'urgence de doter l'industrie sylvicole d'un code d'accréditation permettant aux entreprises d'évoluer à l'intérieur de normes préétablies qui sont gages de la qualité du travail de l'entreprise et qui permettent d'éviter à des entreprises moins sérieuses de venir briser l'équilibre établi dans le marché.

De plus, lors des consultations nationales, l'AETSQ déposera un mémoire sur une analyse structurelle de l'industrie sylvicole du Québec et proposera des solutions afin d'en faire une industrie structurée dans laquelle la population québécoise aura confiance et qui sera prête à relever les défis reliés à l'intensification de l'aménagement des forêts. Enfin, l'AETSQ présentera à la Commission les résultats des projets de recherche sur la rentabilité économique et financière d'un traitement sylvicole ainsi qu'une étude sur la rentabilité économique et financière d'une stratégie sylvicole. Ces projets vous étaient d'ailleurs décrits dans le numéro précédent de Canadian Silviculture.

Pour obtenir plus d'information sur la Commission ou pour consulter les mémoires déposés, consultez le site Internet suivant : www.commission-foret.qc.ca.

by Fabien Simard, RPF, Executive Director

Proceedings of the Commission on the Management of Public Forests in Quebec

The government of Quebec established in October 2003 a Commission to Study the Management of Public Forests in Quebec. This scientific and technical commission, described as public and independent, was entrusted with a general mandate to report on the situation affecting management of the public forests of Quebec. When its term ends in December 2004, the Commission will convey its recommendations to the government of Quebec with respect to the improvement and progress of forestry activity as it relates to sustainable development.

The Commission concluded its circuit of regional hearings in June and the next few months will be devoted to analyzing the proposals collected. Some general observations are nevertheless already emerging from the consultations held. In the first place, it is clear beyond dispute that the majority of stakeholders and users of the Quebec forest desire a decentralization in favour of the regions, or a regionalization of public forest management. Among other things, they want to be more involved in all levels of decision-making where the forest industry in their region is directly implicated. Their wish to be assured that forestry development is taking regional concerns into account is obvious. Thus they want to bring the average citizen closer to the decision-making process. The regions are asking to become the real managers of their forests, with power to decide, for example, on silvicultural strategies and on the level of management intensity. As a concrete example, at the present moment determination of the northern limit of forestry activity results from a decision made by the government of Quebec that is based on a study which is not accepted by the forestry community. Decentralizing such decisions would allow regions on the northern limit to relocate this limit by making use of scientific studies in terms of the continuity of the natural limit.

For the present, in the light of the meetings held between the Commission's representatives and those of industry, it seems there is substantial agreement on the desirability of easing the pertinent regulations, which will, in the short, medium and long term, improve and facilitate working conditions in the forest without necessarily threatening Quebec's traditional forestry heritage and yield.

The Forest Industry Council of Quebec has suggested the appointment of an independent forestry director responsible to the National Assembly, who would have responsibility for future forestry predictions in Quebec. The idea of creating a neutral, transparent and apolitical forestry director was well received and was particularly attractive to the Order of Professional Foresters.

For its part, the AETSQ (Association des entrepreneurs de travaux sylvicoles du Québec) and its members have made a similar contribution to the inquiry by submitting three briefs to the Commission. Two of these deal with new mechanical techniques for precommercial thinning; they were drawn up jointly by the Association, the Nokamic Group and E-Forêt. They lay out the problem of a substantially declining labour force in the face of constantly increasing work to be done, as well as the difficulty of interesting new recruits in this hard and demanding employment. One of the solutions to these problems consists of the implementation of a new technique of pre-commercial thinning carried out with the help of specialized machinery that partially mechanizes this type of activity. According to the participants, the emergence of this new technique has the advantage of considerably improving the working conditions of forestry workers, which will ultimately make this activity more attractive to both workers and new recruits.

The other brief submitted by the AETSQ, in collaboration this time with Nord-Forêt, is concerned instead with "accreditation of the competency of silvicultural contractors". The gist of the message delivered by this brief derives from the urgency of giving the forestry industry an accreditation code that will allow companies to develop within pre-established parameters that guarantee the quality of the company's work and that prevent frivolous enterprises from interfering with an orderly market.

Furthermore, when national consultations are held, the AETSQ will submit a brief proposing a structural analysis of the silvicultural industry in Quebec and will offer solutions designed to make it a well-ordered industry, in which the Quebec population will have confidence, and which will be prepared to take up the challenges implied by more intensive forestry management. Finally, the AETSQ will present to the Commission the results of its research projects on the economic and financial profitability of silvicultural treatment, and a study of the economic and financial outcome of a silvicultural strategy. These projects were described for our readers in the previous issue of Canadian Silviculture.

To obtain more information about the Commission or to consult the briefs submitted, go to the Internet site www.commission-foret.qc.ca

AGFOR REPORT

by Gaston Damecour

The 2004 silviculture season is underway. It was a very cool spring so it's hard to believe that summer is here.

The 2003-04 Crown Land Silviculture Statistics just arrived. The notables are planting up 77% over 2000, and PCT (pre-commercial thinning) up 11% over 2000. PCT's window of opportunity to mitigate the low point in the wood supply in many parts of the province is beginning to close; this is reflected in the 2002 management plans, resulting in a renewed emphasis on reforestation. The interest in reforestation is in part driven by the decades of superior seed selection, now into the second generation seed trees which offer improved yield and quality, and in part by improved species composition on planted sites.

The increased interest in reforestation was followed by a sudden (all of the forest management plans were updated for 2002) strong demand for seedlings. This shift created a slight shortage in seedling supply with production at local nurseries maxed-out and an increase in out-of-province sourcing. According to Kevin Topolniski, Chief Forester at Nexfor Fraser, they had achieved their freehold silviculture program in four years instead of five, and curtailed planting in the final year. Consequently their tree nursery at the Second Falls near Edmunston had no problems to sell the (surplus) seedlings to other forest interests.

The 2003 season saw some catching-up over 2002 as nurseries adjusted production to meet the new Crown reforestation levels at around 23 Million seedlings. Nexfor Fraser's Crown silviculture program for 2004 is proceeding according to plan.

The increase in planting should normally be accompanied by a decrease in PCT. The recent $5.5M increase in provincial silviculture funding on Crown lands has resulted in the sudden 11% increase in PCT (because of the shortage of seedlings) as opposed to a projected slight decrease.

The appearance of mechanical PCT units allows high stems per hectare areas to be treated. The mechanical component clears (mows) 2m corridors, leaving 5m strips to be thinned by spacing saw operators. According to Craig Frame, Forester with the New Brunswick's Department of Natural Resources' (NBDNR) Forest Utilization and Silviculture (Section), the practice is particularly effective in the 40,000 to 90,000 stems per ha range in large areas in remote locations. The system allows treatment of stands that would simply be too daunting and uneconomical. The advent of the mechanical PCT on Crown lands is of interest to the private woodlot sector which is experiencing regional difficulties in sourcing PCT operators.

Silviculture on private land, according to Bill Hamilton, NBDNR Forester with the Forest Utilization and Silviculture (Section), has seen a 32% increase in reforestation from 2001 to 2003 and a 16% decrease in PCT activity. Part is driven by one of the Marketing Boards acquiring the former DNR tree nursery at Madran.

We are expecting the Select Committee of the New Brunswick Legislative Assembly on Wood Supply's report shortly. It was prompted by Jaakko Pöyry's New Brunswick Crown Forests: Assessment of Stewardship and Management. The Committee's report is expected to fuel another round of discussions following a similar series of reports from the Atlantic Provinces Economic Council (APEC), the Crown Land's Network, the New Brunswick Department of Natural Resources staff and University of New Brunswick's Thom Erdle.

Gaston Damecour is a Registered Professional Forester in New Brunswick and Nova Scotia. He is a senior consultant and principal of AGFOR Inc., a New Brunswick-based forest and management consulting firm. Damecour has been instrumental in bringing about significant changes in the forest sector by representing both governments and industries on such issues as health and safety, forestry equipment standards, industrial relations, wood allocations and forest management policy. He has worked with communities, businesses and various interest groups to initiate change.

PRINCE EDWARD ISLAND

FOREST IMPROVEMENT ASSOCIATION

by Wanson Hemphill, Manager

Summer has finally arrived with cool temperatures, firmer roads and golf temptations. Prices for studwood have increased and many contractors are actively looking for stumpage to harvest. Clearcutting is still the most used method of harvesting although some alternative treatments are available through a Provincial Forest Enhancement Program. Some forest owners are allowing mature white spruce to collapse rather than have it clearcut. Owner reasons include: the look of clearcuts; tax and pension implications; ecological enhancements and looking for other treatments that leave most of the forest standing.

Forest Certification is inching closer with attempts by Pan-Canadian to find interested owners for certification trials, and a small group of owners in Kings County applying for FSC certification using a Resource Manager. FSC certification here aims to rebuild the mixed Acadian forest species and quality, with different ages and heights using the existing canopy as shade for tolerant species planting and growth while promoting biodiversity.

Many forest stakeholders are concerned about a predicted reduction in tree planting due to 10% Provincial budget cuts. Tree planting of seedlings from the best trees and seed orchards is seen as a way to rebuild the quality of PEI forests and to mitigate the impact of clearcutting and leaving the forest to regenerate from surrounding trees and cycle naturally from pioneer species to longer lived forests over time. A meeting with Provincial Minister MacAdam is scheduled on this concern.

Sector Councils are still moving ahead slowly with a Provincial Sector Council established and the hiring of a Sector Council Director. Sector Councils allow each sector or industry to plan and implement its own human resource needs.

Forest contractors are being made aware of the “business case for safety” where prevention of injuries can be shown as an excellent investment with a very high return and can also increase employee productivity and job satisfaction.

Please have a safe and healthy summer.

SILVICULTURE CONTRACTORS ASSOCIATION

by Alan O'Brien

As I write this, another tree planting season is ending for Silviculture Contractors in NS. This season was marked by a severe frost in parts of the province on June 5-6. I have witnessed the impact on planting sites, where exposed seedlings have either been stunted (death of this spring's bud flush) or killed. The province also received a stretch of extreme cold (for this part of the country), with temperatures falling as low as -40 C over several weeks in late January and early February. These low temperatures occurred in conjunction with relatively little snow cover, and may have played a role in the high mortality rate of Red Spruce seedlings this season. Most contractors were limited to the number of Red Spruce seedlings they were able to purchase from provincial nurseries. As a result of this shortage, planting on some private land blocks will not be completed in 2004 and will have to be readdressed in 2005. This may impede industry's compliance with silviculture legislation.

Vegetative management deadlines are approaching for the herbiciding season that runs from late August through September. Permits must be submitted to the Department of the Environment, 90 days prior to commencement of a spray treatment on a site. A site inspection is then done by the Department of Natural Resources to either approve or deny the treatment. As an interesting footnote, one substantial industry player in Nova Scotia does not permit herbiciding in their silviculture program. They have experienced an inadequate survival rate of Spruce seedlings on their planted sites, probably as a direct result of this policy.

The Hurricane Juan salvage continues on private land. The prices for some roadside forest products (softwood sawlogs $75.00 /tonne) have remained high for this time of year. Typically, prices fall after the reopening of provincial secondary roads in May.

Most Contractors put their emphasis on Pre-Commercial thinnings from the beginning of July until the snow flies in December. To qualify for a pre-commercial thinning treatment, stands must meet a minimum height requirement of 2m for softwood and 6m for hardwood. In Nova Scotia, this treatment is most often carried out on softwood stands. The main benefit is that stand dynamics can be drastically changed by increasing some species percentages while decreasing others. eg. pre-treatment stem counts - bF 8000 rS 2000 gB 4000 rM 2500 vs. post treatment stem counts - bF 500 rS 1500 gB 50 rM 250.

This example shows a concentration on the volume growth of Red Spruce. The two stands would produce the same amount of wood fibre over x number of years. The first example would see the majority of the wood fibre growth on Balsam Fir, while the second would produce mainly Spruce wood fibre. You cannot increase wood volume from a stand by spacing it , however, you can increase the volume of a targeted species. When properly done, it is also an esthetically pleasing treatment.

A Short History of Canadian tree planting tools

by Pierre Roy

Hoedad/Mattock

In Canada, reforestation began in Quebec about 100 years ago, in Ontario and BC 70 years ago, and in Alberta 50 years ago. At that time, the mattocks as they were officially called in the Ministry of Forests records, or hoedads as everyone in the west called them, were the tools of choice. This planting tool was well adapted to planting bareroot stock, especially on hillsides. The hoedad worked well for screefing the duff layer and the curved adze ash handle helped to hold the hand in the ideal ergonomic position, 30 degrees above the horizontal. The handle was the right length for one step and a full arced swing to the eight foot spacing required to plant the standard 680 trees per acre. The flat, prairie grain elevator shaped blade helped create a brick-shaped planting hole. Hoedads required a good striking force to penetrate the ground, and many cases of tendonitis resulted though the wooden handle muffled the vibrations. BC's main manufacturer Zaccarelli Brothers, a blacksmithing shop in Victoria, had been making the tools for twenty years to this standard shape, and a sharpen able hardness (around 40 on the Rockwell C scale).

In Ontario, in the sixties, the containerized Paperpot system was

introduced from Finland. Paperpot was a complete growing and handling system from nursery to filling line to planting. Paperpots held together very well and had been made easy to plant in 1948 by an aging planter who invented a tool named after him.

Pottiputki

The Pottiputki was a planting tube that had the great advantage over other systems of not requiring the planter to bend down. He simply pushed the duck nose into the ground, opened its jaw with a foot lever, and dropped the seedling through the tube. With good site preparation and abundant mineral soil, production records were broken, without breaking planters backs. But in the cold northern soils, the paper was not breaking down and roots were not getting through the paper.

A new generation of tree planters came along in the seventies with the massive increase of the reforestation program in BC. In 1972, Jack Wells first requested that Zacarelli streamline his hoedad blade shape to fit his highballer self image. This was to protect the steel edge curled from hitting rocks, and then the sharp furls stripped the seedling roots, when being used to train the roots into the hole, (in 1974, Dirk Brinkman requested Zacarelli stop sharpening the edge and instead round the edge like a ballistic bullet nose). He learned from Zacarelli how they hard-edged the steel strip used for the leading edge of cat blades, which did not split from rocks. By hardening (or hard-edging) the bullet rounded edges (to about 47-48 on the Rockwell C scale) the heads wore gradually, without splitting or curling, and produced blades that could plant 2-300,000 trees.

Equally an art was the selection of a good adze handle, just the right diameter and grain to fit the style of the user. Good handles could also last to plant hundreds of thousands of trees. Because a poor handle often broke quickly, planters were very good at fitting blades to handles and adjusting the blade to the angle that worked best for their style. A good handle was a keeper. Numerous visits to the manufacturers in Ontario to select the best wood, form and diameter also produced runs of specialized hoedad handles for highball crews.

Dibbledad

When container stock was introduced, a narrow bladed hoedad, known as a dibbledad, was introduced to make a thinner hole. A number of other hoedad anomalies were also tried, such as tools with dibbles on one side and a narrow hoedad blade on the other.

In the 1970's, Pelton introduced the mudpack, a seedling's bareroots were rolled into mud in a large cigarette roller and then dried until the 'mudpack' stiffened. These mudpacks were planted with a solid steel dibble which transmitted every stone impact directly to the planters hand bones and tendons with inevitable results. By the mid-seventies, Kingsma and Van Eerden had developed the styroblock container and designed dibbles - blunt steel pokers on long wooden shovel handles to plant the various sizes.

Dibble

The dibbles were startlingly easy to use compared to planting bareroot on flat ground, with back bent most of the time thereby stressing the lower back.

By 1976, shovel planting was introduced in northern BC by Carl Loland of Tawa. They cut American-made drain tile spades and cat track shovels from 50cm to about 30 cm length, as the full blade would buckle to the force exerted on the handle to open a hole. Flat steel kickers were welded on these custom cut blades to save wear and tear on planters' boots and feet. The blades required frequent sharpening as they had a soft steel edge, breakage was common and the curling lips stripped roots. Many planters would get their spades cut down in a local shop to a shape that suited the many different stock sizes of the eighties. It was not uncommon to see a planter carrying 2, 3 or 4 spades of different shapes or sizes around in a golf bag.

Around 1982, Ed Walter's Sustained Yield Enterprises and Brinkman's Treeplanter's Grubstake and Silviculture Supplies joined forces to form Forestworld. One of the first actions of this new enterprise was to design the ultimate treeplanting spade, so they ordered sample spades from all of the forging companies from around the world. Pitting them against each other, by seeing which would cut the other in a diagonal collision, they narrowed their choice to two British manufacturers, Bulldog and Spear & Jackson. They paid to build a new mould for their design.

Treeplanter Spades

The unique design of a flattened thick tapering blade, straight shank and bullet-rounded edge was the birth of the Treeplanter spade. This tool is unquestionably the most successful planting tool ever introduced, and thousands of units are still sold annually. The early runs at Spear & Jackson were specified to be hard-edged to 47-48 on the Rockwell C scale and lasted longer than later tools.

In Québec, in the 1980's, the Ministry of Forest copied the design of a Scandinavian Multipot system and ordered the containers from local injection molding suppliers. They also ordered tools for these container seedlings (there were three sizes) from Garant, a garden tool manufacturer, that modified a

Carrot Extractor

Dibble with foot plate

fork handle and developed a dibble with a foot plate, that also acted as a depth limiter, and screw-on heads to accommodate the different stock sizes.

The weight of the tool, and soil compaction problems in heavier soils, called for a different tool to emerge. The 'hole pipe', originated in Sweden, had interchangeable heads that were threaded on. Difficult to change and expensive, Pierre Roy of NovaSylva developed and introduced a new carrot extractor, in Quebec, in 1986. This tool also had removable heads, hollow or solid, allowing planters to choose the proper head suited to stock and terrain. It also had a kick bar welded a couple inches higher than the top of the planting head, which allowed for full penetration into growing soil when debris was on the ground. The first 'carrot extractors' were made of angle iron with a vinyl grip at 90 degrees to the shaft. Despite many other versions, using a wooden Dee or straight handle, and in spite of its low-tech appearance, the low-cost and lightweight angle iron 'carrot extractor' made it a favourite with planters and contractors. It is still the most popular planting tool in Québec today.

Like all tools with vertical handles, planters were ramming the tool into the ground with great force in efforts to increase production, resulting in considerable shock being transmitted to the planter's arm when striking rocks. The obvious but difficult idea of installing a shock absorber between the head and the handle was tackled by Feric researcher Ernst Stjernberg, who conducted numerous tests on a variety of materials. In 1987, NovaSylva built a neoprene shock absorber into the head attachment that decreased the amplitude of the shock wave transmitted to the planter's hand. These still come with every extractor. Another shock absorber developed by NovaSylva involved a wooden handle sliding in a metallic tube against a compression spring that would attenuate impacts.

Inspired by ancient warrior weapons, Forestworld also designed the Planting spear for planting small containers. Forged from a solid piece of steel, fitted with a T or straight handle, it was an indestructible tool that could create a planting hole in anything but solid rock. In eastern Canada, the spear was never widely used because it needed a special planting technique, and the stigma of the tool not fitting the container shape prevented its acceptance by MOF.

Planting Spear

Speed Spade

Instead, cut down spades became common, and now custom-sizing the Treeplanter spade results in a much better tool than earlier custom American shovels. There were so many planters requesting a smaller spade that Forestworld had the Speed spade forged in England, in the late 1980's. Narrower, shorter, and thicker than the treeplanter spade, it was perfect for planting container seedlings of all sizes, and small bareroot stock. It became extremely popular and it led to even shorter 'Plug spade' versions.

In the 1990's, the emergence of very large (300cc +) container seedlings created a need for new tools. Inspired by garden bulb planters, versions of a carrot extractor for these larger containers failed to release the soil from the tool. Researcher Michel St-Amour at Feric came up with an idea that was eventually licensed to NovaSylva. The tip of the carrot extractor was cut at a 25 degree angle from the ground level to allow for gradual soil penetration. Another important improvement was the open front design. The sidewall of the cylinder was cut open 180 degrees, leaving only a cutting edge. This allowed the plug of soil to be ejected (or flop out of the side) hole after hole.

Although this tool worked reasonably well in medium to heavy soils, when stones were present around the perimeter of the tool, it was very difficult to drive into the ground. The speed spade ended up the preferred tool, after the inadequacy of form-fitting tools finally made clear: size does matter!

There was a lot of attention to the ergonomics of planting tools in the 1980's and 1990s, particularly in western Canada. Straight, Dee, Tee handles, wood and fiberglass shafts of various lengths were fitted onto tools, eventually to suit planters characteristics and tastes. But student turnover meant hiring thousands of new planters every year, and in many cases, the contractor equipped its planters with the required tools and seedling carriers. It was difficult to predict the choice planters would make for tools, so the standard one-meter tool length with Dee handle became the one and only choice for the new planter. Straight handles, which used to suit about 30% of planters, have become an odd sight.

Recent efforts at Bushpro, developing a better Dee handle with help of die-hard Feric researcher Ernst Stjernberg and another new manufacturer, are an example of the direction tools may be going. This is considered to improve ergonomics and reduce injury. Test results from the 2004 season will be reported in a later edition of Canadian Silviculture.

Because of the more generic nature of the tools, from which people are customizing their personal blade and handle, and the relatively high and uniform quality of the stock, price has become the primary criterion for choosing a tool or a supplier. Fewer specialized manufacturers are willing or able to invest time and money into new tools that will be difficult to sell, particularly in a no-growth market.

However, improving on an industry standard, reducing the number of injuries, and offering better comfort without having to re-train planters, should be an easy sell, so long as the tool is not more expensive to buy.

Pierre Roy started his career in silviculture in 1982 as a treeplanter and project supervisor with Brinkman & Associates Reforestation. From 1985-1997, Pierre was President of NovaSylva, a manufacturer and distributor of treeplanting equipment. He then was Vice-President, Sales & Marketing for Turboforest NovaSylva a manufacturer of treeplanting tools and low-impact forestry equipment. Pierre took on the position of President of NovaJack in 2001. From 2003 to present, he has been President of Portable Winch, a manufacturer of gas-powered capstan winches. Pierre can be reached at 819-563-2193.

Intensive Silviculture Decisions...

The fifth National Forest Strategy (NFS) 2003-2008 a sustainable forest, the Canadian commitment (http://nfsc.forest.ca/strategies/strategy5.html#i) is filled with clear goals and commitments to action arrived at through consultation and consensus. The National Forest Strategy's Vision, Issues and Writing Committee occasionally took conflicting input from stakeholders and recommended the issue be studied further.

The mandate for intensive forest management in the NFS is such an 'action' item:

1.7 Evaluate the full range of advantages and disadvantages of Intensive Forest Management across Canada.

During the period of the previous NFS (1998-2003), intensive forestry, intensive silviculture, or stand enhancement treatments, which at that time were predominantly undertaken for the single benefit of enhancing timber value, went into decline. Intensive forest management included activities like genetic improvement, spacing, conifer release, pre-commercial thinning, commercial thinning, fertilization, cleaning or brushing, pruning and various combination treatments. These treatments declined across Canada because costs were perceived to be greater than the timber benefits - especially when the future timber benefits were discounted to net present value - and because of new emerging values and understanding of forest dynamics.

Analytic decision making for enhancing timber value

Many foresters developed a variety of analytic tools and methods to determine whether and how intensive forestry investments should be made, and how they pay back in enhanced timber value. The realization that investments for timber value may not pay back, in the west, reached a watershed in a definitive benchmark analysis undertaken by Reid Carter and Eleanor McWilliam's for Forest Renewal BC (FRBC) in 1998. They applied a common investment/benefit analysis to compare survey and historic growth data, across each treatment or activity option, on various site types. This economic analysis was designed to facilitate the selection of the optimum treatment/site combinations within FRBC's budgets. It became a benchmark analysis because it helped define the limits of intensive forestry investment for enhancing timber value. It is not complicated to understand that if trees grow slowly, they give a return too far into the future to be greater than the interest cost on the money invested.

Reid Carter went on to become a forest industry investment analyst with the National Bank. He saw that product differentiation, not the raw material source, creates market value. In his paper, 'Enhanced forestry can create jobs…Does it create value?' written in 2001, he only recommended: investment in genetic improvement (the cost per hectare was low); fertilization (the benefit was volume which appeared within a few years); brushing (important for stand establishment); and a few select treatments only in high sites where a fast growth response had been demonstrated. BC's Forest Investment Fund (FIA) reduced the 2003 investment in intensive forestry to under $5 million, from over $100 million at FRBC's peak in 1997.

Eleanor McWilliams, working as a forest economist with JS Thrower & Associates, went on to develop the analytic decision-making tools into 'Quantitative Silviculture', an intensive forest management expert decision-making system. The web site offers answers to questions like, "Will fertilization give a positive return on investment or should I invest the money and buy wood on the open market in the future?" Similar systems, which use expert analysis to mix economic and value choices, have been designed for use in several other provinces.

Timber value is the product of a relatively

...in Ecosystem Based Forest Management

free market pricing system, and therefore provides a strong economic context for intensive forest management decision-making. Quantitative Silviculture and other expert systems are right to rely on known values for guiding decisions. In doing so, they do not ignore other ecosystem values, these are reflected as constraints through planning in compliance with regulations for environmental protection. Where values can be quantified, they provide for them.

Action item 1.7 Intensive Forest Management falls under the first and underlying theme of the current NFS

2003-2008, which is Ecosystem Based Management (EBM). EBM is described in the NFS as "An ecosystem-based approach to managing our natural resources … considers all the benefits the forest can provide, whether these are direct benefits, such as wood, water, carbon sequestration, wildlife habitat, recreation, hunting, trapping, fish habitat, fishing or wildfoods, or indirect benefits, such as the beauty of the forest landscape or the satisfaction that society derives from its forest. Management also considers human and natural disturbances such as fire, insects and disease when making choices to optimize forest use over time. Managing the forest to encompass this wide spectrum of benefits is complex because they often conflict."

An EBM approach requires a forester to blend all of these values into their forest management stratagems. Intensive treatment prescriptions within EBM are taken to a more complex level to mimic the complexity, adaptability and responsiveness of life. It is a paradigm shift from historic single timber value systems with ecosystem constraints.

Intensive forest management historically referred to concentrating activity in select forest stands, as opposed to 'extensive forest management' - the least cost treatment - relying largely on natural processes in Canada's generally healthy extensive forest ecosystems to realize forest management objectives. Considered within EBM, intensive forest management in the future may refer to a concentration of benefits on one site from one adapted integrative treatment.

Changes in forest dynamics and emerging values

In part, integrative planning arises from new market values that are becoming widely enough understood to begin trading. This is due to some major shifts in public understanding of forest dynamics. Incidents like the catastrophic infestation of mountain pine bark beetle, major fires and rainfalls have contributed to this increased awareness of the results of climate change and fuel suppression.

In June's federal election, Prime Minister Paul Martin made the Liberal commitment to fight global warming as the number one issue differentiating the Liberals from the New Conservatives. Recent polls indicate over 78% of Canadians support taking action to prevent (further) climate change. Federal negotiators are reaching greenhouse gas emission agreements on caps and trade with more and more Canadian industries including the forest industry. The European Union is entering the mandatory Emissions Trading Scheme within half a year. At that point, trading in what is expected to be the largest commodity traded in the world will begin in earnest, and these prices will influence forest management decisions.

BC's forests were expected to be a net sink of 48 gigatonnes of carbon per year. Greenhouse gas emissions from the pine bark beetle devastation alone may reverse that, unless BC takes major actions to mitigate those emissions, like reforesting and salvaging wood for

energy. Canadian wood pellets are now being shipped to European electrical generators to replace fossil fuels.
Restoring a healthy forest stand density and residual fuel accumulation through a harvest for timber or pulp and using the waste to make wood pellets for energy to replace fossil fuels while interpolating a carbon trade, all require the application of similar economic market principles to realize the highest level of treatment efficiency and return on investment.

Integrated Landscape Management

To assist decision-making in this new synthesis of values, there is another emerging tool - Integrated Landscape Management (ILM). ILM is an approach to planning and assessing land uses and human activities over whole landscapes. The approach is based on a system of integrated management with respect to various stakeholders and interest groups that is applied over appropriate time periods and spatial scales necessary to achieve multiple management objectives. It is like applying land use management on an operational scale.
A newly formed National Integrated Landscape Management coalition identified a set of elements or shifts required for ILMs successful implementation. These include: substantive legal and policy framework; expansion of land use planning capacity with landscape visualization tools; linking land use planning decisions to resource rights; improving cumulative effects and full life cycle impact and mitigation analysis; establishing common standards for operational planning, monitoring, reporting, and reclamation activities; overcoming the deeply entrenched silo approach and the historical patterns of sector-based or single resource-based management; recognizing the value of collaboration, cooperative ventures, partnerships and stewardship to name some.
Integrated landscape management planning includes analytic options comparison. In combination, it leads to integrated treatments that would, for example, salvage forest mortality, reduce fire risk, restore ecosystem health, improve stand value and reduce CO2 emissions. Combining ILM and analytic systems will build on the skills, experience and common sense of those who are familiar with historic planning and implementation.
Reforestation once differed from intensive silviculture by having an immediate source of funding-- the value of the harvest or clearing (seismic, hydro etc.) and having the reforestation obligation clearly and legally linked to the area harvested or cleared. Since costs and benefits are traded on the same land base and in present time, reforestation has been accepted as a cost of doing business.
Intensive forest management also has the potential to become an essential part of the cost of maintaining the forest capital, through trading management for access to the resource on the same area-based forest license, and within ecosystem-based management thereby transforming it into a cost of doing business.
But to get there will take considerable cooperation, collective effort and marketing the incredible sustainability of harvesting products while maintaining the integrity of Canada's natural forest ecosystems for the benefit of future generations and the rest of the world.

Dirk Brinkman is CEO of Brinkman & Associates Reforestation, editor of Canadian Silviculture and sat on the Vision, Issues and Writing Committee of the National Forest Strategy 2003-2008. He co-chairs the ecosystem-based NFS theme team with Elizabeth May, sits on the Steering Committee of the NFS Implementation Coalition, and is a member of the National Integrated Landscape Management Coalition.

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