

CANADIAN SILVICULTURE MAGAZINE

vol.3 no.4

FALL 1995

1995
SILVICULTURE
BUYERS GUIDE

in this issue:

**Latest fallout in the
silviculture industry**

**New Yukon forestry
agreement**

**Uncontrolled burns
singe Ontario**

**plus regional silviculture
reports from across Canada**



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ON THE COVER

Prescribed burn near Clearwater BC.

Photo by Mikael Kjellström

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Subscriptions are \$18 for one year or \$30 for two years. These prices do not include GST. Please make your payment payable to the *Canadian Silviculture Magazine* and mail your request to: 4-1825 Nelson Street, Vancouver, BC, V6G 1M9.

Canadian Silviculture Magazine is published quarterly by CSM Inc. It is available only by subscription. Opinions expressed by the authors do not necessarily represent the views of CSM Inc.

Printed in Canada by Van Press Printers
ISSN 1201-4079

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Sustaining intensive silviculture investments

Dirk Brinkman

Sustainable commandment

In 1987, Brundtland took the commandment "Thou shalt not steal" and put a Vedic spin on it—"Thou shalt not steal from future generations," to inspire an ethic of sustainable development. That same year, the BC government stopped subsidizing the reforestation of harvested areas and made reforestation a cost of harvesting. Up to that time, reforestation was viewed as an investment in a future generation's resources, which had a low rate of return because of the long time span involved.

The BC Silviculture Regulation was followed by Alberta in 1991, Ontario in 1994, and this year the Yukon. In 1995, BC expanded the silviculture regulation into an environmental regulation, called the Forest Practices Code, similar to codes in the US Northwest. These regulations entrench the principle that maintaining the value of the resource is a cost of the harvest not an investment in an unknown future.

Intensive institutionalisation

With the formation of Forest Renewal BC (FRBC) and the Forest Inventory Investment Program (FRIP) in Alberta funded by new stumpage levies, the cost of enhancing the forest through intensive silviculture was added as a further cost of the harvest. While FRBC is initially funding the restoration of watersheds (a one-time program aimed at demobilizing roads), the primary goal is to increase forest value for all users.

Intensive silviculture funding has appeared and disappeared many times before. The soon-too-expire federal-provincial FRDAs are the latest of these disappearing funds. Can the silviculture industry expect these new initiatives to last?

If a downward fluctuation in wood product prices synchronizes with an

election, as is possible in BC in the next nine months, a Crown corporation like FRBC may be at risk. This risk is increased because FRBC is currently compromising the enhancement value for the forests by awarding the work without normal market-efficiency criteria to target voter groups.

This will result in some of the embarrassing scenarios that accompanied federal make-work funding for intensive forestry in the '80s and will force a major change in how programs are delivered.

World wood demand growing

The ability of governments to keep tapping silviculture funds from wood-product prices depends on future trends in the global wood-product market. During his two-year sabbatical in BC, New Zealand's Dr. Wink Sutton gave many talks that argued convincingly that the world demand for timber will increase even more rapidly than it has in the past.

Population growth may slow through industrialization. However, using Korea as an example, the stabilization of population growth due to a higher standard of living also results in an increased per-capita consumption of wood. The rate of conversion of the world's population from non-industrialized wood consumers to industrialized consumers has accelerated in the '90s with economic booms in southeast Asia, South and Central America and parts of the former USSR.

% Pop Increase	GDP (US\$)	Wood Use (M ³)
1980	1.10	\$2290
1990	.98	\$5400

Table 1: Korean wood consumption and GDP per capita.

Wink also pointed out that substitution is not an option due to the environmental costs of the increased energy required to manufacture alternatives (e.g., steel, aluminum, concrete, plastics). The

following figures are taken from a US study by Dr. Koch (1992):

	Increased energy use
Steel vs. wood studs	900%
Concrete vs. wood floor	2100%
Brick veneer vs. plywood	3000%

Table 2: Energy use of wood products compared to alternatives.

Combining the three scenarios of world population growth, an increasing percentage of consumers and a lack of wood substitutes means that demand for wood is going to increase even more rapidly than it has in past decades.

Plantations cannot meet this demand in the next 30 years: of the 100-million hectares worldwide in plantations, over 85% are slow-growing species in the northern hemisphere. Most of the 14-million hectares in the tropics are for pulp, so saw logs will be especially in short supply.

This suggests that the trend towards increased prices for wood products will continue, and funds like FRBC and FRIP to enhance established stands will not only be sustainable, but may even be imitated in other provinces.

Sustainably intensive silviculture

Despite these global trends, wood-product price-fluctuations are inevitable because of the large numbers of market-responsive regions that are well equipped to increase their harvest in the short-term whenever wood prices rise (or environment regulations limit harvesting). However, the fundamental soundness of the principle of allocating stumpage to enhance established stands and maintain or increase the harvest will endure.

In a recent *Journal of Forestry* article, Roger Sejo argued that the pressure for increased production may eventually be greatest in areas where environmental considerations have been addressed.

"Given the fact that logging restrictions in one region will be off-set by logging increases elsewhere, the global issue is not whether to log but where to log. A decision to protect environment by reducing the timber harvest in one region will not necessarily generate a net global reduction in effects ...the most efficient way to deal with global environmental problems is to identify the regions of the world where the problems are most severe and to concentrate mitigation efforts there. Such a strategy may even encourage timber harvesting where... (it) is likely to be most environmentally benign."

This increases the value of enhancing forest growth through programs like FRBC and FRIP when they are conducted in the context of a rigorous Forest Practices Code.

Certification enhanced silviculture

Although the certification of wood products is proceeding along several independent paths— with the environment movement, industry, north/south and various national interests still in conflict— consumer demands will force cooperation. More and more, regions and countries (California, New York, Holland, Germany, UK), as well as major suppliers like Home Depot, are declaring their intention to restrict forest products to sustainable ones.

Since the Clayoquot agreement and CORE, the area of BC's working forest is beginning to be defined, and the terms of reference for sustainable forest management are beginning to be defined. The Clayoquot Scientific Panel's selective harvesting recommendations are now the leading sustainable forest practices in Canada. Now the work of enhancing the volume and value of the harvest through intensive silviculture can begin. ♦

Another vehicle-related planter death in BC

Near Slave Lake on August 3, 1995, a suburban vehicle belonging to a contractor working on a sub-contract to Tsuga Forestry Services, rolled near the Martin River and a treeplanter was killed. A number of other planters were seriously injured. When the Coroner's report is available, we will provide readers with more information. (For more information on safety in this issue of CSM, see the review of a recent BC WCB study on page 36.) — WSCA

New harvesters preserve the forest soil

Environment-friendly, commercial logging-vehicles will soon be rolling off BC production lines through a joint venture between Silvacom (North America) Industries Inc. and a Malaysian manufacturer. The rubber-tired, four-wheel-drive vehicles have far better traction and maneuverability in tight spots, with far less tire-wear than conventional steel-tracked logging equipment currently on the market. Designer Martyn Morgan says the vehicles can go into forests and pull or push heavy loads without damaging the ground. "They can turn without chewing up ground or digging holes in the soil. Soil is the true natural resource. Timber is only the harvest." — *Vancouver Sun*

FRBC to spend \$250 million

Forest Renewal BC's business plan indicates that it plans to spend \$250 million this year to ensure "the continuing health and productivity of our forests, and jobs today and tomorrow." FRBC has already approved programs and projects totalling \$150 million which will create an estimated 2,350 person-years of employment. The funds come from stumpage and royalties on Crown forest land. Over the last two years FRBC has built up a "rainy day fund" of \$350 million to bridge future stumpage shortfalls. — *FRBC*

Ontario's regeneration crisis

Ontario MNR has released its second *Survey of Artificially Regenerated Sites* (SOARS II) which examines forest sites artificially regenerated up to 1980. The picture painted by SOARS II is not pretty. Although results vary across regions and species, in every instance target species failed to achieve acceptable stocking on at least half the sites. White spruce was the least successful commercial species, achieving acceptable stocking on only 25 to 30% of the sites for which it was targeted. Jack Pine was the most successful by stocking 40 to 50% of targeted sites. The SOARS II report is available from the OMNR by calling (705) 946-2981. — *OMNR*

PEI government releases forest resource report

The recent PEI government *Report On Forest Resource Issues* states that the average age of softwood being cut is 50 years, and that white spruce growing on old farm fields only lives to between 50 and 60 years, and then, falls down creating fire and disease hazards. The report forecasts that the province can continue to cut at current levels for the next 20 years when the farm-field white-spruce resource will have been cut or fallen down of its own accord. Following, that is, a projected 15 to 20 year period when fewer sawlogs will be available until plantations start to mature.

The PEI Forest Improvement Association (PEIFIA) hopes that the information in the report will clear up public misconception and misunderstanding of PEI forest resources. "If these stands are cut before they fall and replanted with improved quality seedlings, then we can improve our forests for future benefits," emphasizes PEIFIA general manager Wanson Hemphill.

...continued on page 42

Tree stability debate important

Dear Editor:

Congratulations on giving exposure to the important issue of tree stability in your magazine. It is good to see this debate taking place in a national forum such as your magazine. Too many such issues in our country are discussed regionally, whereby a lot of duplication takes place in each region.

I enjoyed Henry Spencer's contribution to the tree stability debate. I think many people consider him rightly as one of the founding fathers of the containerized nursery movement. He is a "not so young" experienced forester who has seen many things, and who is beyond the stage in life of strict commercial interest.

I think one of the points he made deserves emphasis. He tells us about seeing seedlings at a typical nursery that had to be rootbound, before they could be extracted from their Styrofoam blocks. That is a key point indeed, and I believe one of the reasons why (on my travels around the globe) I do not see Styrofoam containers any more in countries where tree stability is considered important, and copper pruning not an option. These countries include Finland, France, New Zealand, Sweden and Norway.

Instead, it is important to use a container system from which extraction is easy. This is done through design of the plug, but also through using hard plastic, which is harder and smoother:

- It is much easier to extract the seedling, and thus
- It is no longer necessary to keep the seedling so long in the plug.

As a side benefit, the hard plastic material gives the tray a longer lifespan, lowering production costs of the seedlings.

All of this brought BCC to offer Sideslit trays in Canada in both the Multipot format and the BC Styroblock format, so as to make the conversion to air pruning simple and painless for nurseries using Multipots or Styroblocks today.

Arne F. Aiking, BCC Sylviculture Systems Inc.

More container research needed

Dear Editor:

Thanks for publishing my rambling letter in part. In the other part, I had offered to write a slightly less coloured letter to publish. You published most of what I sent any way.

Probably now the BCE and Lannen people will feel obliged to defend themselves. They have good containers and, I understand from the people I have talked to, good results in stem caliper. Although the slit-sided containers by their design have wider spacing to get the caliper, they do take up a lot of space in a greenhouse. The design also makes for a large root surface exposure. The extra water needed risks the grey mold problem. Other companies' designs have used copper or root traps to promote lateral root development for greater stability to the tree and better pickup of surface nutrients. But there are some "downers" here.

Roots will grow where there is moisture, air and nutrient, and will atrophy where this is not the case. The soil is often warmer at the surface, which speeds up surface root growth as long as the weather is not too dry. If you think about it, this kind of seedling will grow with a large proportion of roots on the surface in a big pan. Then, it may not be as well anchored for withstanding a storm as a tree that has a deeper foundation.

There is a general opinion that roots pinched together at the bottom of a typical solid wall or styro container may not grow horizontally. But they grow well under most conditions, and though the roots may be 10 to 15 centimetres below the surface, they will probably give a better anchor to a 20-metre high tree than partially exposed roots on the surface ever could. And during a hot dry summer, deeper roots may be needed for survival. When the winter is long and cold, the roots that are below the

surface of the ground a metre or more will benefit most. In many places, the soil at that depth is at 45°F all winter.

The more we get to understand nature, the more we realize that it will not be bound by engineering principles. As an engineer, I can understand folks doing designs that favour the bottom line. For instance, why not use cell-pots or pro-trays or plug flats, spray them with copper carbonate, and use the wide spacing provided by one to get good stem caliper, or by the other to get quick transplants? Only 40 cents per ten-twenty bedding plant insert or less. Why not grooved round tubelings, big enough to get good spacing, air passages between each seedling, wall thickness of plastic as thin as possible, to be slit and planted at the same time?

The first one is possibly toxic to personnel. The second depends on a medium that will drain, and the CRIQ in Quebec tried this with bad results. The province of Ontario tried tubelings that frost-heaved furiously.

Why not use Oasis block or wedges? Initial trials in 1965 were stopped because the wicking effect of the medium dried the soil out for 10 centimetres around the seedling. We joyfully turfed these old ideas out at the time. But from a bottom line standpoint, maybe we should take time to look at those ideas once again, because now we have a much better knowledge of what it costs to grow and plant seedlings.

We also need bigger, healthier seedlings. You can't cut next to a clear-cut until the reforestation/regeneration is above a specified height. You can't use herbicides to beat competition. And being tempted to grow larger seedlings in the same size of containers we have at present, we are obliged to think about root form and stability.

Just at the time when governments are cutting back on research, we need plenty of it.

Henry A. Spencer, Spencer Lemaire Industries Ltd.

Planters have root responsibility

Dear Editor:

Your on-going discussion about root form is of great interest to me.

However, the finger is being pointed partly at the wrong culprit.

In the Nelson Forest Region office, there used to be a sign: "a poor tree well planted is better than a good tree poorly planted, but a good tree well planted is best."

I point the big finger at the planter. While root egress is the key to healthy survival, planting hole preparation is underrated in the quest for speed. Straight and tight do not a well-planted tree make.

As long as planting is enforced and supervised by people who do not know how to do the job themselves—foresters and technicians—the problem is likely to continue.

As a selective logger and spacer, I deal with forestry types that don't have a clue of what constitutes a technically good job. While books contain a lot of valuable information, they cannot teach you how to do physical

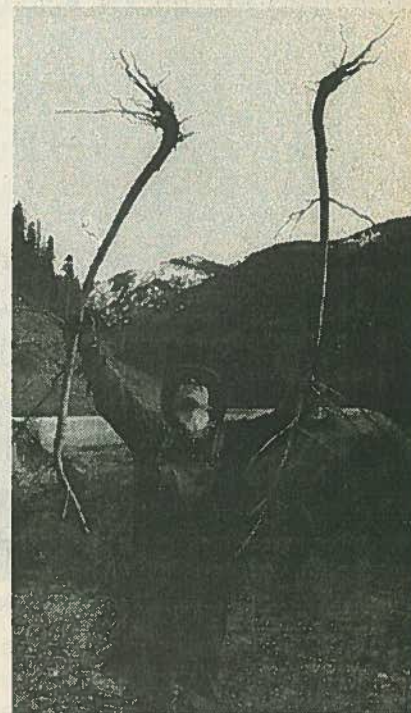
labour. They can only help you perfect your skills.

So if a forester or a techie cannot tell the difference between a really well-planted tree and a borderline one, how can he or she be expected to cough up the extra money to pay for the difference. It's the same in selective logging. A "green illusion" can be a silvicultural slum worse than a clearcut.

I say put all the pencil pushers and pink fingers out planting trees, setting chokers and pulling boards on the greenchain. It would plug a big hole in their professional expertise. By the same token, the labour force could stand to do some reading.

The accompanying picture shows 20-year-old bareroot yellow pine planted by a forest service crew. What kind of training and supervision did these planters receive? Shallow, J-root trees are as serious a crime to the "suits" as two healthy trees planted four feet apart.

Greg Wozny



Greg Wozny with two J-rooted 20-year-old bareroot pine

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Timberjack 810B forwarder wins design award

The new Timberjack 810B forwarder has won the prestigious 1994 Pro Finnish Design Award. The jury said the 810B demonstrated respect for both nature and the machine's operators. The advanced ergonomic design of the 810B's new generation cab received special mention.

Timberjack's R&D team came up with several high-tech solutions that enhance the reliability of the 810B. Hydrostatic transmission, for example, guarantees the right amount of power and the new computerized control system makes it easier to regulate all machine operations. The patented bogie axle system and extra width tires reduce ground pressure and improve the general maneuverability of the machine in the forest.

The forwarder can use bio-diesel fuel and biodegradable hydraulic oils. The air conditioner uses R134 fluid, which does not damage the ozone layer. The 810B's working environment is a giant step forward in ergonomic design. This, in turn, will minimize damage to the forest environment: the less physical and mental stress, the more operators can

concentrate on their main job.

To reduce noise levels inside the cab, the R&D team worked closely with the Technical Research Centre of Finland. The noise level in the cab during operations is less than 70 dB(A), which is less than a normal car. By using hydraulic shocks, they were also able to reduce vibration levels in the cab. Contact: (519) 537-6271.



TimberJack's award-winning 810B Forwarder.

New field ambulances save lives and money

Horizon's Industrial Ambulance and Mobile Treatment Centre provides a cost-effective solution to quality emergency care and transport needs. These fibermold, slide-in units offer rugged off-road construction with transferability between vehicles.

The silviculture industry's remote locations make access to needed medical care difficult and time-consuming. Every minute after a serious accident is critical

and may mean the difference between life and death. The Horizon field ambulances are available at all times near the workers, providing fast response and safe transportation.

Spacious interiors combined with conveniently located cabinets comfortably accommodate patient(s) and attendant. Units may be purchased with medical equipment included.

Easily mounted on any full-size pickup, field ambulances provide a more sensible solution than a permanently dedicated vehicle. The durable ambulance will outlast the lifetime of several trucks, and when necessary, can be moved easily to available vehicles.

The Horizon field ambulances meet WCB requirements. Contact: (604) 946-0033, fax (604) 946-0522.

Stihl biodegradable chain oil

Stihl Bioplus™, a biodegradable bar and chain lubricant, is made with a vegetable oil base. This means that when excess oil is introduced to the environment, it is less harmful to microorganisms and plants. The oil also offers excellent flow characteristics at low temperatures (down to -20C) and a high flash point (approximately 190C).



Horizon field ambulances are easily mounted on any full-size pickup.

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SILVITOOLS

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In addition to the environmental benefits, Stihl Bioplus™ offers other benefits over glycol or synthetic-based oils. Bioplus™ oil doesn't resinify. This means that the heavy deposits associated with the combination of synthetic oil, sawdust and tree sap are eliminated. Without the deposits, saw chain rivets and other parts receive better lubrication, resulting in less wear and increased bar and chain life. Contact: (804) 463-7247.

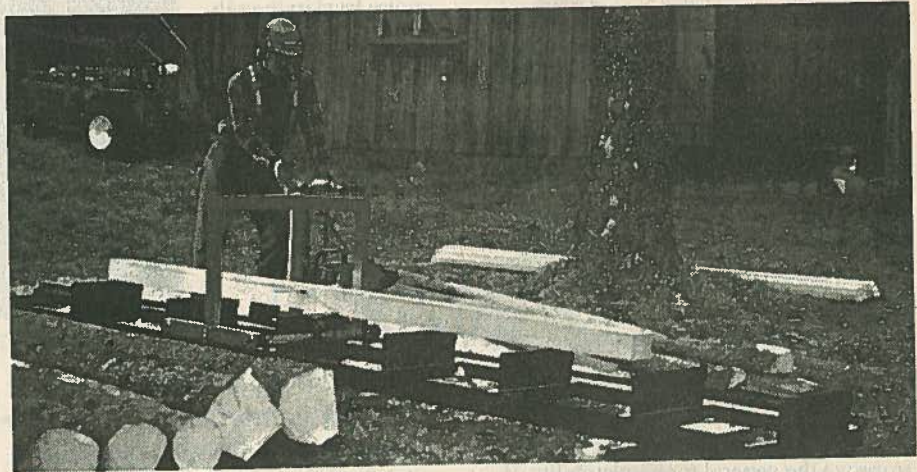
Jonsered mini-sawmill makes log handling simple

The new Jonsered 600+ mini-sawmill—powered by a 95 cc Jonsered chainsaw model 2095 Turbo—has ground-level construction to keep log lifting to a minimum.

The mini-sawmill consists of one saw carriage and two or more rail sections. The handling operation is very simple: the log is rolled into place, the desired log

diameter is adjusted and the saw carriage is rolled along the log. The cutting depth can be adjusted continuously from 0.12 inch (3 mm) up to 50x50 cm beams. The sawmill is supplied with two 10-foot (3 m) rail sections, able to cut lengths of 17 feet (5.20 m). Additional 1.5 or 3 m sections can be added as needed. The Jonsered 2095 Turbo is the most

powerful chainsaw used with any mini-sawmill on the market. The turbo air cleaning system removes 99% of the dirt and sawdust from the intake air before it reaches the filter. This means that the mini-sawmill can run all day without unnecessary interruptions for cleaning the filter or adjusting the carburetor. Contact: (514) 562-7974.



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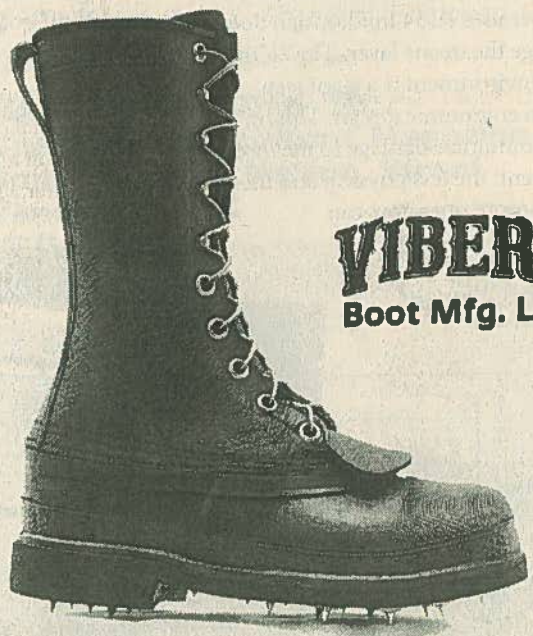
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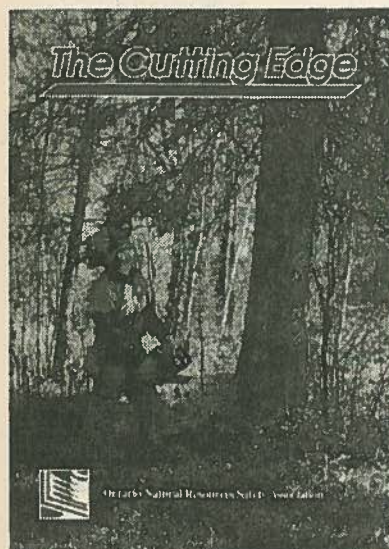
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New publications

The Cutting Edge

The Cutting Edge is a newly revised and completely updated 126-page bible of safe chainsaw use. Designed for ease of



access to useful information, this little handbook features straight-forward descriptions in one-page units that deal with one topic each. Written in plain language and featuring over 130 photos and diagrams, it explains the secrets of kickback prevention, safe grip and stance, how to prevent hangups, pinched bars and "barber chairs." It includes detailed instructions for notching and felling trees, and for dealing with a wide variety of hazards and problem situations.

The Cutting Edge is published by the Ontario Natural Resources Safety Association (ONRSA). The cost for non-members is \$15.00 plus taxes. The ONRSA is the safety association for the forestry, pulp and paper and mining industries in Ontario, and is recognized worldwide as a leader in chainsaw safety training. *The Cutting Edge* is available through the ONRSA Resource Centre by faxing 1-800-850-5519.

Safety guidelines for tree planters

BC's MOF has released a *Minimum Safety Guidelines for Tree Planters* to assist planters in having a safe and prosperous work season. The 40-page booklet contains information that planters need to know before and during the planting season including:

- Working conditions planters can expect;
- Employers' and workers' rights and responsibilities for safety and health;
- Preparing for work;
- Camp standards and safety;
- Transportation safety;
- Site hazards; and
- Safe work procedures.

The specific topics covered are wide ranging—from pre-season physical conditioning exercises to nutrition guidelines to safety around helicopters. The booklet is available from BC MOF's Silviculture Practices Branch at (604) 387-8922. ♦

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Will BC's silviculture industry fallout mean higher prices in 1996?

John Betts

Last year three major BC and Alberta silviculture firms, Tawa Reforestation Enterprises, Evergreen Forestry services (Alberta) and Twig Contracting Ltd., pulled their respective plugs and quit the treeplanting business— leaving a 30 million tree hole in it.

Some people have begun wondering whether these now-defunct veteran companies— who represented \$6 to \$10 million worth of work annually and at least 45 years of contracting experience between them— are just the usual marketplace fatalities. Or is there something so drastically wrong with Western Canada's multi-billion dollar silviculture industry that it's now regularly losing long-established firms as part of the collateral damage of the marketplace?

"Quitting was just a straight business decision," says Pacific Regeneration Technologies President Charlie Johnson. In 1990 Johnson's PRT, the largest nursery operator in BC,

bought Tawa, one of the largest treeplanting companies in the province. The purchase created the first vertically integrated treeplanting company operating in Western Canada.

Despite all the latent potential, the combination never really flew. Now, after planting 12 to 15 million trees annually for the past two decades, Tawa is no longer planting in the Interior and is down to just a few operations on the coast.

...after planting 12 to 15 million trees annually for the past two decades, Tawa is no longer planting in the Interior ...

"After you've tried for four years and you've tried a few different things, then you really question whether that might be affecting the other side of your business... When we were having problems with Tawa, we made a decision to stick to our main knitting."

For Johnson it's back to primarily growing trees— a business he says is less risky than planting, despite the \$20 million PRT has put into its nursery operations since the 1980s.

Bill Williams who ran Tawa for PRT says pretty much the same thing: the effort didn't reap the return. And it was further aggravated by static prices in the marketplace and meagre margins. "We were basically planting trees today at 1987 prices," says Williams.

Evergreen Forestry Services' Bob Vinson's decision to leave treeplanting was mainly personal. "I've been in this business for 17 years," he says. "How long did you want me to stick around?"

Although he didn't want to talk a lot about it, Vinson allowed he'd worked his butt off, he was tired, he hadn't lost his shirt and now he was looking around for some other forestry things to do. "I don't think these younger guys coming up know just how tough this industry is," says Vinson.

But if the young up-and-coming contractors don't know the business yet, the old ones do. And seeing three of their seasoned cohorts quit in one swoop has

them worried, not just about themselves but about the whole silvicultural industry.

"The way the forest industry treats their loggers and the way they treat their silviculture contractors are two different things," says Peter Gommerud, WSCA president.

"I've been in the business for 25 years and the forest industry has always been interested in a stable and competent logging and trucking force. But they've never been interested in developing a strong silvicultural force."

Even with preferred bidding and some private industry direct-award contracts, Gommerud says silviculture contractors still don't enjoy the long-term relationship with clients that the harvesting end does. "Companies don't engage you in the kind of discussions they would engage logging contractors in their planning process."

That puts silviculture contractors in the perennial position of second-class citizens in the forest industry. Contractors say this dubious status too often leaves them measured against their competitors by just one criterion— the final figure at the bottom of the bid tender.

"The industry doesn't appreciate what we do because they don't go into the field. They hire seasonal staff to do the field work or they contract it out.

"If they bought a million-dollar planer for their sawmill, they'd go out and look at it. But they won't do that when it comes to a million-dollar silviculture program," says Gommerud.

Worse than being ignored by some clients, contractors argue they must keep up pace on the bidding treadmill even when the competition is reduced. Not only does it mean continually coming up

with the smallest numbers on the bids, but the uncertainty that produces makes it hard to extend investment horizons beyond a few months.

"I think the whole industry needs some long-term contracts so you can properly plan for staff, financing, vehicles, etc.," says Johnson.

"When you're on a year-to-year basis, contract-by-contract basis it's very difficult to properly plan a business the way you want to."

Even though prices may have come up a bit in the last couple of years, "none of that has flowed through to the bottom line or to planters' wages—it's been taken up by other costs," says Gommerud.

Gommerud heard from a number of contractors who quit last year—including a small host of lesser players—that "the margins were just too low to compensate for the investment risk."

When WSCA directors met recently to review the state of their industry, they realized there was a cluster of contractors who'd been in the business for 15 years or more, and then a conspicuous absence of any contractors in the five to 15-year range. This seems to suggest that few new contractors survive the current demands of the contracting business more than five years. The older ones have persevered largely by building up their assets over time, particularly in the beginning when things were a little more wide open, says Gommerud.

But with the apparently ruthless natural selection of the marketplace culling the odd established firms and the younger, less experienced firms repeating the learning curve about the real costs of doing business—depressing the market in the process—Gommerud and his association are left looking for ways to relieve the industry of its chronic competitiveness.

"The business is just always too much on the wire. Although, overall I don't think the industry is in all that bad shape. But it wouldn't take much for us to be bleeding red ink. And it wouldn't take too much to go awry for that to happen."

Chronic competitiveness. Allegedly little understanding from the client industry. Rising business costs and meagre profit margins. A high rate of contractor mortality. Is the silviculture industry unfolding as it should or is it unravelling at the seams?

According to one micro-economic model, the treeplanting industry is behaving normally for the kind of industry it is.

"What strikes me about the industry is that it is a classically competitive industry," says Professor Aidan Vining who teaches policy analysis and business administration at Simon Fraser University.

"If you think about it, there aren't vast economies of scale. Nor are there vast bases for differentiation.

"Given the terrain of BC and Alberta, treeplanting work is a very labour intensive industry. There is really not much opportunity to do it any more cheaply with a large firm than a small one. Big firms cannot take advantage of their bigness through any economies of scale."

It's the same with differentiation, the idea that one product is different, that is, better than another.

"Treeplanting is not an industry where it is very easy to convince consumers to pay a little more for what they perceive is a differentiated product. That is, there is very little room for contractors to demonstrate that they do things better than anybody else in a way that actually gets reflected in an ongoing business."

The result says Vining is a competitive situation that creates a buyers' market, which from a broad public policy perspective, is not always a bad thing. But that may not be the prognosis contractors want to hear.

"In a classic competitive industry, the

firms only make a normal return (which means) firms only overturn enough just to keep them in the industry.

"Therefore treeplanting is an industry where you would expect a fair amount of turnover. Another sign that the treeplanting industry is a competitive industry is that both barriers to entry and exit are low." In this model, Vining says the industry is likely to spawn a continual stream of new contractors who think they can move up from planting to bidding on work.

"Eventually these contractors get older and their opportunity costs change, and they say this is a very tough way to make a living, and then they mature out of the industry. There is no law of nature that there aren't businesses that are best suited to young people."

But that doesn't mean experience is worth nothing. In fact, experience may be the only thing veteran contractors have going for them. "The advantage of being in the business for a long while is the accumulation of

knowledge—of organizing and keeping people in the woods and being very good at bidding.

"I bet," says Vining, "that without knowing the treeplanting industry that well, that the scarcest resource and skill in this industry is knowing how to bid well."

But what is bidding well? "I think contractors are their own worst enemy," says Gommerud. "Contractors have convinced themselves that they're quite replaceable and that clients don't really respect what they do and would gladly trade them for someone else. So they bid accordingly."

It's not up to the clients to tell contractors to bid higher, says Gommerud. "I think contractors have to change. They have to

...when you're on a year-to-year basis, contract-by-contract basis it's very difficult to properly plan a business the way you want to...

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step out a bit and say, 'I'm going to increase my margins a bit and take the risk. Maybe I'll lose some of my market share but I'll just have an easier time of it because I won't have so many trees to do.' They have to buck up their courage a bit."

Vining emphasizes that the model he compared treeplanting to is just that: a model. It's not an analysis of the industry. And it neatly avoids the messy debate about the character and quality of some of the performances and players in the business.

"I don't think it's a level playing field out there in the industry," says Johnson. Large companies are likely to get more picked on by regulatory agencies than small ones, he insists, leading to a double standard. And low-balling, lousy operators are certainly part of the market equation. Last year, a BC Provincial court judge gave out a stiff fine to a company whose owners pleaded guilty to dumping trees into a river.

A few years ago in Alberta, a WCB inspector began dropping into camps and crews by helicopter, as part of an investigation of the industry, after seven planters died in a van crash. The majority of the camps were "appalling" and, in one case, the crew literally dropped their bags and ran when he flew in. The inspector had to coax the haywire contractor and his crew out of some nearby trees. The inspector says things have gotten better but there are still contractors in Alberta who don't play by the rules.

In BC, the Ministry of Forests is considering reintroducing a contractor rating and eligibility system to weed out problem contractors before they get work.

But the problem is not just contractors who don't compete legitimately. "You're dealing with a bunch of small

businessmen who don't think like businessmen," says Johnson echoing Gommerud's comment that contractors are defeating themselves in their bidding battles.

So how do you get the silviculture industry to start thinking differently? And if it did, how much could it change the chronic competitiveness according to Vining's model? "What we teach in business strategy is how you can make your industry less competitive," says Vining. "That's the key to higher profits."

But first, Vining says, consider the perspective of the buyers. "They want a competitive industry. Does it cost them anything to have a fair amount of entry and exit (from the industry)? That's the crucial point.

"If you could argue that they are losing something from (the turnover)—that special knowledge about doing the job is being lost or that the trees get planted more poorly because of this—then you have a case."

According to Vining, it's up to the industry to convince its clients that there is a difference between firms in terms of reputation and quality. But the model of a competitive industry has a built-in

...it's up to the industry to convince its clients that there is a difference between firms in terms of reputation and quality...

irony—the operators are usually so preoccupied with managing the ongoing fray, they have little time to consider the bigger picture.

That seems borne out by experience. Gommerud admits the WSCA has had problems from the beginning in getting broad-base support from the industry to form an effective lobby.

If the industry is in fact teetering and competing itself to death, it may take a small catastrophe to bring the point home.

Last year, the tree vacuum created by the loss of players seems to have been absorbed by the industry. It is still unclear whether fewer major players will result in higher prices for 1996. But will the industry be able to cope if more players "mature out" of the business due to fiscal or personal fatigue? And was it even worth it for the firms who picked up the extra trees last year left by the quitters?

Gommerud wonders. "We don't know yet. Those costs are still coming home to roost." ♦

BC MOF reconsiders a Silviculture Contractor Performance System

The BC Ministry of Forests is looking into using a new silviculture information system to help weed out incompetent silviculture firms bidding on ministry work.

Although still in the discussion stage, the new system may involve reviving some aspects of the ministry's old contractor performance system abandoned in 1990. If developed, the new contractor information system would go on-line with the ministry's Integrated Silviculture Information System (ISIS) that currently monitors ministry-administered lands and projects.

At the moment, ISIS is geared towards recording how plantations perform rather than the performance of the contractors who work on them. But the ministry hopes they can piggy-back the system to keep track of silviculture firms as well.

Under the old process, contractors were rated on the percentage of ministry contracts they successfully completed. Poorer performers faced higher performance bonds and, in extreme cases, disqualification from bidding. However, after a few years, the system collapsed when the ministry found it impossible to effectively manage the data required to fairly monitor contractors.

Only about an annual average of six percent of ministry contractors have failed to complete projects over the past

five years. Still, managers in Victoria's silviculture practices branch say inept contractors are a nagging problem they'd like to see go away.

"It is just kind of ongoing," says Robin Brown, Forest Renewal Section manager. "Since we dropped the previous system, people have come back and said, 'Why don't we put something in place?' We've even had contractors saying the same thing."

At the moment, districts can access ISIS to find out if a contractor has failed a contract recently. But that is about as sophisticated as the system gets. And as Brown points out, the information that comes out is only as good as what goes in. "We've run into some problems in the past because we didn't get everyone entering information."

Although they're not "cracking the whip" over the districts, Brown is urging staff to start filling in all of the blanks on the ISIS data base. From that, he hopes enough information will be recorded to make more sophisticated assessments of contractors' qualifications.

But getting the data may be the easy part. "The problem then is how to apply it into a rating," says Brown. Hampered by incomplete and not always reliable data, the previous performance system also foundered on the idea of what was an acceptable rate of failure.

Brown and his department also have to consider other aspects of contractor behaviour which may not show up in the narrow criteria of contract completion.

"Our people often said sometimes a problem with a contractor was that he (or she) completed the work but it took a lot of babysitting in the process. In our system that kind of information doesn't show up."

There is a simple solution to that problem but Brown admits the districts don't always act accordingly.

"We are always telling our people, 'Look, don't babysit a bad contractor. There are plenty of good ones around.'"

"From the branch's point of view, we've always said we'd rather eat the trees if we

have to rather than keep a contractor on the job when he (or she) fails to meet the standards and conditions."

But in the heat of the battle, Brown admits the districts often put up with an inept or difficult contractor rather than risk the project.

"I like the idea of a rating system. I'd like to steer work, making sure the better contractors get it. They're more reliable and you don't need to babysit them. When you have the better contractors, it takes less staff time and all the rest of it." ♦

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Yukon interim forestry agreement

Lorenzo Rugo, forest economist

Ronald A. Win, Minister of Indian Affairs and Northern Development, announced the launch of an interim Yukon Forest Policy on August 4, 1995. This policy establishes the Edward Elijah Smith Reforestation Program, the formation of a Yukon Forestry Advisory Committee, an increase in stumpage fees and changes to forest tenure.

Under the interim policy, Department of Indian Affairs and Northern Development (DIAND) will promote the sustainable development of the Yukon forest resource. Minister Irwin stated that "the Edward Elijah Smith Reforestation Program and the Yukon Forestry Advisory Committee will be used to accomplish the objectives of reforestation and support the sustainable development of Yukon forest resource."

Background

In March 1995, DIAND concluded that changes to Yukon forest policy were required to promote sustainable forestry, provide for reforestation, improve the tenure system and generate a fair return through an increase in stumpage. In April 1995, a discussion paper was distributed in response to three Yukon forest resource management issues: stumpage pricing, reforestation and forest tenure.

Subsequent to public meetings in May and feedback from Yukoners, DIAND has decided to implement the following interim policy changes to Yukon forestry, effective immediately:

Yukon forestry advisory committee

A small Yukon Forestry Advisory Committee will be formed which will focus on broad forest policy issues and advise DIAND on the management of the Edward Elijah Smith Reforestation program. Committee participation will be broad based.

Individuals from the aboriginal community, Yukon Territorial Government, DIAND, forestry industry and environmental groups will be invited to participate.

Edward Elijah Smith reforestation program

Through the Edward Elijah Smith Reforestation Program, forest renewal on lands held under Commercial

Timber Permits (volumes 500 to 15,000 cubic metres) will be supported by a reforestation charge of \$5 per cubic metre harvested. The reforestation charge is essential to enable proper reforestation to

take place and promote sustainable development. Low-volume wood-users (less than 500 cubic metres per year) will not be charged the reforestation levy. The federal government will collect the reforestation charge.

The program is named in honour of Edward Elijah Smith who was born in Hutshi Village, Yukon, on July 17, 1912. He was elected Chief of the Whitehorse Indian Band in 1967 and, along with his many other accomplishments, is credited for beginning land claims

negotiations in the Yukon. He served part of a term as vice-chair of the Council for Yukon Indians (CYI) and was assistant negotiator for CYI from 1979 to 1980. He remained a prominent figure during the entire process of land claims up to his death in October 1991.

...a two-tier stumpage-price model will be initiated: one for logs processed within the Yukon, and another for logs exported unprocessed out of territory...

Stumpage

Application of a two-tier stumpage-price model will be initiated: one for logs processed within the Yukon (Tier One), and another for logs exported unprocessed out of territory (Tier Two).

Within Tier One, local wood operators holding a Commercial Timber Permit (500 to 15,000 m³) will be charged a stumpage price of \$5 per cubic metre, harvested for logs processed within the Yukon. Up to 25% of unprocessed logs allocated to local wood operators may be exported subject to the Tier Two stumpage rate. Low-volume wood-users holding a Commercial Timber Permit (<500 m³) will also be charged a stumpage price of \$5 per cubic metre harvested and prohibited from exporting unprocessed logs from the Yukon.

...continued on page 27

...changes to Yukon forest policy were required to promote sustainable forestry and provide for reforestation...

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Within Tier Two, wood operators holding a Commercial Timber Permit (500 to 15,000 m³) and exporting unprocessed logs from the Yukon will be charged a stumpage price of \$10 per cubic metre harvested.

Tier One seeks to develop the economic base of the Yukon forest industry by encouraging a processing advantage. During the public meetings, Yukoners often stated that the export of unprocessed logs from the Yukon is equivalent to exporting jobs. A key to mill survival is the manufacture of value-added products and development of markets. Tier Two seeks to generate a fair return to the government for the use of a public resource.

Forest tenure

The Yukon interim forest policy provides for a one-year Commercial Timber Permit for low-volume wood-users harvesting less than 500 m³ per year. A two-year Commercial Timber

Permit is established, for volumes between 500 and 15,000 m³ per year, for wood that is processed in the Yukon or exported out of territory. The granting of longer tenure will be considered in the future. This will be an important element in future public consultations on the development of longer term policies.

Timber harvest limit

The Yukon timber-harvest limit for the 1995-96 harvest season is set at 450,000 m³. Within this limit, 250,000 m³ of timber is available for local wood operators and low-volume wood-users.

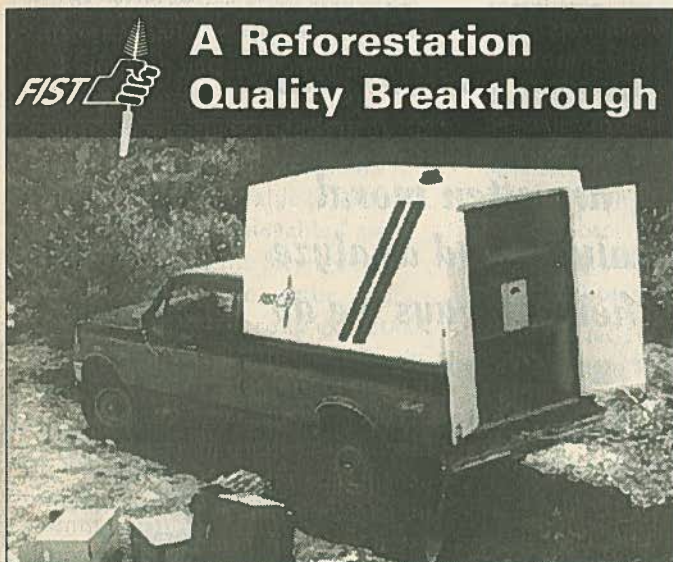
Local wood operators (500 to 15,000 m³) are allowed to export up to 25% of their allocated volume unprocessed from the Yukon. Low-volume wood-users (<500 m³) are prohibited from

exporting unprocessed logs. The remaining 200,000 m³ is available for export unprocessed from the Yukon.

The 1995-96 Yukon timber-harvest limit does not include wood volumes held under existing Timber Harvest Agreements or wood volumes

**...forest renewal on
lands held under
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Permits will be
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UN conference examines forest practices

John Betts

Foresters, scientists, politicians and businessmen from 32 countries met at a UN conference in Prince George last month and laid the ground work for an international code of forest practice.

The 200 delegates from countries as disparate as Ireland, India, Denmark and Czechoslovakia discussed a host of issues related to forest management practices around the world.

Many of the participants were with the Timber Committee of the United Nations

Economic Committee for Europe (UNECE), an influential group that Rod Maides of the Canadian Forest Service described as an organization noted for more than just noble talk.

"This group works very, very hard at moving things from the policy discussion stage to actual practice," said Maides.

But participants at the seminar were ready to admit there is some distance between agreed-upon international sets of forest criteria and what gets practiced on the ground in many countries.

A final international code is a long way off according to Cit Prins of the

UNECE. He added, however, that nations are finding they have to respond to public expectations and pressure from environmental groups.

In its draft report the seminar agreed that "an international, non-binding set of guidelines for sustainable forest management should be prepared. This would be a useful contribution to the international forest policy debate and to improving planning and operational standards worldwide."

Working with themes - including

sustainable forestry and ecological processes, developing forest practice codes, forest practice monitoring procedures - policy and science delegates found one of the most contentious issues to be socio-economic changes in relation to forest management practices.

*...the most
interesting discussion
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are often moral
values, and analyze
them in ways we do
with commodity
values in an economic
sense...*

For instance, how do you measure in the international commodity market the value of clean air and water produced by forests?

"Probably the most interesting discussion has been about whether you can take social values, which are often moral values, and analyze them in ways we do with commodity values in an

Self-funded silviculture for forest co-ops

economic sense," said discussion group leader Lynn Huetad.

Keynote speakers in Prince George spoke on the general seminar themes including recommending a holistic approach to forest practices, the use of modern planning techniques, better forestry education, and adaptive management techniques.

Dr. Per Anglestam, a Swedish forester, pointed out how intensive forest management in the boreal forests of northern Europe is reducing biodiversity in stands and landscapes.

Canada's parliamentary secretary on natural resources, George Rideout, pledged that forest practices across Canada should be sustainable within two years. Rideout said there are 90 initiatives ongoing that should help the country reach the sustainable goal by 1997.

But the definition of what standards should be used to judge the level of sustainability led to some controversy.

"I have to say that Mr. Rideout seems to be misinforming the public in thinking that (sustainable forest practices) may be achievable," said Vicky Husband of the Sierra Club. Husband, who was not at the conference, said her group expects it will take Canada at least ten years to reach sustainable forest practices.

At the conclusion of the talks, Prins said the next major step is to begin moving the conference's recommendations for a global forest practices code into the international community.

"We, for our part in Geneva and Rome, will try to find resources first and develop a negotiating procedure to take this further," he said.

The conference also recommended that an international agency be set up to help poorer nations develop codes for their forests. ♦

Jennie Johnson

The forest industry of Nova Scotia was disheartened by news that the Cooperation Agreement for Forestry Development (CAFD) between Canada and Nova Scotia was not renewed. For many forest workers and woodlot owners, this could make forest stewardship an economic burden that they will not be able or willing to bear. Despite the announcement of \$2 million available for silviculture treatments across the province by the Nova Scotia Department of Natural Resources, the prospects for continued forest management in Nova Scotia are dim.

North Colchester Forest Cooperative Ltd. (NCFCL), a member of the Forest Group Venture Association of Nova Scotia, had some good news for its members at the 11th Annual General Meeting in June. The Board of Directors has approved a self-funded silviculture initiative that will see the Cooperative reinvesting a portion of its undistributed profits from the past two fiscal years into silviculture treatments on members' woodlots. In the upcoming year, the formula allocates up to \$50 thousand for this program.

Why did NCFCL take this initiative? According to NCFCL manager Tim Keenan, "The rationale is twofold. First, it is necessary to invest in forest improvement to sustain production in the long-term, and the magnitude of these investments will often deter landowners from making them unassisted. Second, the availability of funds for forest improvement is essential to getting the work done, and other sources (government programs) seem to be drying up."

To participate in this program, landowners will be required to contribute in reforestation, stand

improvement and access improvement.

The age of the forest management plan will also be a deciding factor in determining eligibility for participation. The treatments will be based on the recommendations of the staff forester as identified in existing forest management plans first, and new plans as they are written.

Keenan cites the three main benefits to new and potential members: "First, (there is) an assurance that reforestation of harvested areas will be undertaken; second, other forest improvement activities will be supported in spite of government cutbacks; and third, returns on their silviculture investment are much more attractive where their financial contribution is a fraction of the treatment cost."

North Colchester Forest Cooperative Ltd. is the first, and so far, the only member of the Forest Group Venture Association of Nova Scotia to embark on such a program. ♦

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PEI woodlot owners getting organized

by Wanson Hemphill

There is renewed interest in woodlot owner associations in PEI. The withdrawal of federal funding for the Forest Resource Development Agreements (FRDAs) and the increased level of harvesting due to the high demand for lumber in the United States led many woodlot owners to realize that they need organizations to represent their interests.

The one surviving organization was the Central Prince Woodlot Owner Association, in existence since the early 1980s. John Ramsay was elected as president along with a new executive in March 1994.

In April 1994, woodlot owners mainly from the Hunter River and Bonshaw areas got together to form the Queen's County Woodlot Owner's Association. A few weeks later, a group of woodlot owners in Kings formed the Eastern Kings Woodlot Owner's Association with Bob Vatcher as president.

In late May, the three groups got together to form the PEI Woodlot Owner's Association to act as an umbrella organization representing all PEI woodlot owners. Hunter River's

Bruce McCallum was elected as president.

The PEI Woodlot Owner's Association joined the Canadian Federation of Woodlot Owners in September 1994, and has worked closely with the Forest Group Ventures Association of Nova Scotia and the New Brunswick Federation of Woodlot Owners, in trying to secure new federal funding for forest management on private woodlands. A joint, Maritime woodlot-owners proposal was submitted to ACOA in December 1994 at the request of Minister David Dingwall.

PEI woodlot owner associations also joined the PEI Forest Improvement Association (FIA) which represents all stakeholders in the province's forestry sector. Extensive discussions have been held with the PEI Department of Agriculture, Fisheries and Forestry and all stakeholders to try to come up with a formula for a new, jointly-funded woodlot management program.

The goals of the three woodlot associations, loosely stated are:

- To educate woodlot owners in matters relating to sustainable forest management.
- To raise public awareness of the importance of PEI's forest resource and the need for responsible management.
- To provide market information on stumpage rates and the prices of wood products throughout the region.
- To represent the interests of all woodlot owners to the public, industry and governments.
- To serve as a base for the possible future collective buying and marketing of woodlot products. ♦

PEI Forest management: whose responsibility?

by Wanson Hemphill

The Canadian Constitution (1982) Section 92a gives Provinces exclusive powers over Conservation and Natural Resource Management.

Moreover, according to the PEI Forest Management Act (1988) #3, "The Minister is responsible for the conservation, management and protection of forest lands in accordance with this Act and regulations."

Is forest management, then, clearly the responsibility of the provincial Forestry Minister? What about the 12,000 owners of 90% of the resource or the forest industry users who profit from management, harvest and processing? What about future wood supply shortages and the jobs and taxes that go with it? What about the coming Sustainable Forestry Certification where we will have to prove our wood products come from managed forests? What about the increased potential for negative environmental impacts? What about the public pressure to replant more of our harvest sites to ensure future productive forests? What about the increasing conversion of forested land to agriculture?

What about the federal government that collects private and corporate income tax and GST from all forest economic activity? What about the federal commitments to Sustainable Forestry, the Forestry Accord and the Green Plan? How about the Canadian

P.E.I. Forest Improvement Association

Box 27, Victoria PEI
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Ian Dennison, President
Wanson Hemphill,
General Manager

Council of Forest Ministers' commitments? What about our international forest management reputation and markets?

How can the federal government cut federal/provincial forest management agreements and the Natural Resources Canada Budget by 57%, and still expect to honour their commitments and move towards sustainable forestry? Is this not hypocrisy? Where do they expect the shortfall in forest management dollars to come from? What about regional economic development agencies' responsibilities?

How can the federal government cut federal/provincial forest management agreements and the Natural Resources Canada Budget by 57%, and still expect to honour their commitments and move towards sustainable forestry?

The clear solution to many of these concerns and dilemmas is to continue forest management. But how will we fund it and what type of delivery systems are most efficient for getting the job done?

In the recent Speech from the Throne, the PEI government stated that "our forests must have long-term commitment from landowners, the

forest industry and from government if we are to manage and sustain this resource. Without federal funding, we must now develop a new partnership for forest renewal. My government will support such a partnership."

This means that the province is prepared to put additional money into forest management if industry and woodlot owners will contribute. It is an offer that we cannot afford to pass up. We are coming off two very good years for stumpage and wood product prices. Lumber prices have dropped recently but pulp prices are increasing. We must be prepared to put something back in. The simplest way is to allow a small portion of the value of the wood we are currently harvesting to pay for present forest management. This way the mature trees help to pay for the care of their future progeny. ♦

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GPS — ouvriers sylvicoles peuvent être meilleurs rémunérés

René Ouellette, Tech. F., President de Reboitech

Le système de positionnement par satellite (GPS) a entraîné une meilleure précision et une vitesse accrue dans le mesurage de superficie au profit du topofile. Il a résolu de nombreux litiges entre les différents intervenants du Ministère des Forêts du Québec (MFQ) des compagnies bénéficiaires de CAAF et des exécutants.

Par ailleurs, le GPS amène une diminution du personnel affecté au mesurage et le dédoublement de l'emploi que cela occasionnait entre chaque intervenant a diminué de 90%. Pour les entrepreneurs en travaux sylvicoles la gestion est plus précise. Cela implique de recevoir des compagnies les montants forfaitaires correspondants à ceux payés aux travailleurs forestiers. Les ressources humaines ainsi épargnées ont pu être mises à contribution pour d'autres secteurs de la forêt et les ouvriers sylvicoles peuvent être rémunérés à de

meilleurs taux lors de l'exécution des travaux.

Le GPS donne des mesures précises et, utilisé avec un bon logiciel, il permet de connaître la production journalière d'un ouvrier en fonction de chaque terrain via les degrés de difficulté: pente, nombre de tiges à l'hectare, diamètre, hauteur.

Cependant il reste du chemin à parcourir pour que les débroussailliers puissent recevoir une rémunération qui va tenir compte des dépenses reliées à l'exécution de

leur travail (essence, huile, pièces, débroussailleuse transport). La formation des débroussailliers s'est améliorée depuis quelques années mais, le manque de main-d'oeuvre qualifiée dans ce domaine ne permet pas de réaliser tous les travaux sylvicoles.

De plus, le suivi des débroussailliers en forêt durant l'exécution des travaux est à améliorer de la part de l'employeur. Cela augmenterait la production des ouvriers et le total des superficies traitées par année. Il faudra donc remédier à cette lacune, car les retards que nous prendrons dans l'exécution des travaux sont une perte de matière ligneuse à long terme— alors qu'on pourrait obtenir une augmentation de la possibilité à plus court terme.

Qu'est-ce que c'est que la géomatique

Damien Côté

Une définition simple du terme pourrait donc se lire comme suit: discipline

mettant au profit de la gestion de territoire, les technologies informatiques (traitement de données, dessin et cartographie assistés par ordinateur DAO-CAO), dans le but de raffiner les analyses et la production de documents synthèses.

Cette nouvelle discipline devrait

...le ministère des Ressources naturelles prévoit effectuer le passage du mode de gestion traditionnel (carte papier et cahiers d'inventaire forestier) à la gestion numérique...

faire passer le monde de la gestion du territoire et des ressources à l'ère des technologies de l'an 2000, en intégrant l'ensemble des technologies à références spatiales (images satellitaires, GPS, SIRS, etc.) et de l'informatique.

Au Saguenay-Lac-Saint-Jean, la géomatique a fait son entrée en 1987 dans l'industrie forestière (Stone-Consolidated Inc.) et s'est étendue à la majorité des orands industriels en quelques années. Certains industriels en sont même à une deuxième génération de système (informatique oblige).

De son côté, le ministère des Ressources naturelles prévoit effectuer le passage du mode de gestion traditionnel (carte papier et cahiers d'inventaire forestier) à la gestion numérique. Cette opération se

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President

fera par la mise sur pied de son nouveau Système d'Inventaire Éco-Forestier (SIEF), système de cartographie numérique associé à la nouvelle banque de données de l'inventaire forestier. Cet exercice, incluant le montage du système informatique (septembre 1995) devrait être complété d'ici l'an 2000 et comprend la numérisation de 2 400 feuillets cartographiques.

L'outil géomatique peut également être utilisé pour la production de cartes thématiques comme par exemple l'occupation du territoire régional pour les activités de chasse et pêche. La représentation cartographique pourrait alors montrer les ZECS et les POURVOIRIES pour l'ensemble du territoire régional (petite échelle) ou une portion de ce même territoire (grande échelle) montrant alors des détails plus fins. ♦

Ontario Tree Seedling Grower Association revival?

Dirk Brinkman

The Ontario Tree Seedling Growers Association (OTSGA) was once an active organisation in frequent, if often frustrating, debate with the Ontario government over reforestation standards, procurement policy and research issues. This pattern of government consultation with the nursery industry was set up during the previous conservative government.

During the 1995 Ontario election campaign, Conservative candidates from the north promised that Ontario seedling procurement policy would once again prioritize the northern Ontario private nursery sector. With the Conservative victory, some northern Ontario nurseries are anticipating a change in OMNR procurement policy.

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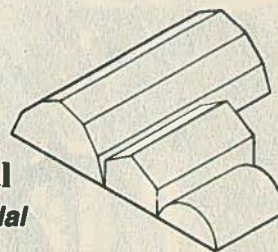
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Uncontrolled burns singe Ontario

Gordon Murray

More than 1800 fires burned an area greater than 600,000 hectares in Ontario this summer— making 1995 one of the worst years on record for fires in Ontario. The provincial government spent more than \$80 million fighting the fires and thousands of residents had to be evacuated from fire-threatened towns.

One of this summer's fire episodes in particular really turned the heat on the OMNR— Dubreuilville. On August 22, the 1200 residents of this small lumber town were forced to flee the oncoming flames of two fires. But the fires that threatened to wipe out the town had been deliberately set by the OMNR almost three weeks earlier— they were "controlled burns" for clearing nearby planting sites of stumps and debris. Unexpected hot dry weather and high winds had caused the "carefully planned" fires to run amok.

Once the Dubreuilville evacuees learned that the OMNR was responsible for the fires, they were outraged and the media joined in the chorus. Ontario Natural Resources Minister Chris Hodgson was also singed because, just the previous day, he had been denouncing "needless and careless fires caused by people." He quickly banned all prescribed burns "until a review of prescribed burn procedures can be conducted."

Thanks to the efforts of more than 500 firefighters

(including 120 elite "Helena Hotshots" from Montana) and some belated luck with the weather, the town of Dubreuilville was saved from destruction and the residents returned after one week of dislocation. However,

the townspeople will continue to feel the effects for many years because a significant portion of the timber supply for the town's major employer was destroyed.

The economic toll of this summer's fires has not yet been fully accounted. In addition to losing hundreds of thousands of hectares of merchantable timber, millions of seedlings in recent plantations were burned.

The political smoke also has not cleared. According to the OSCA's John Lawrence, "Many people in Northern Ontario are questioning why government foresters were out setting deliberate fires during one of the busiest and most dangerous fire seasons in decades." The OMNR obviously has some fence-mending to do. ♦

...many people in Northern Ontario are questioning why government foresters were out setting deliberate fires during one of the busiest fire seasons in decades...



...continued from page 33

In 1995, approximately 50% of the OMNR procurement of seedlings was from out-of-province nurseries. In a few cases, extra-provincial nurseries were the only bidder (BC); in others, they were by far the lowest price (Quebec).

Prices for Ontario seedlings during 1992-1994 were 20-45% below prices for similar seedlings in BC and Alberta. These were dark times for silviculture in Ontario, when the NDP government was trying to slow the deficit by cutting back the reforestation program each year, opening up the tendering to nurseries outside the province, and meanwhile, filling OMNR nurseries to provide guaranteed employment for members of the Ontario Government Employees Union. During this period, many private forest seedling nurseries in northern Ontario were nearly empty, forced to restructure loan payments, and shift to horticultural crops. Some closed completely.

A return to restricted provincial procurement within the context of NAFTA and inter-provincial trade agreements may seem unrealistic.

However, it is currently the political fad to erect trade barriers to government procurement around forest industry-based communities with the objective of stabilising these communities. So there is certainly an opportunity for a new OTSGA-like organisation to encourage community-based northern development initiatives.

The Conservative government has declared it is committed to the new forest legislation making industry responsible for reforestation. There are many problems with implementing this

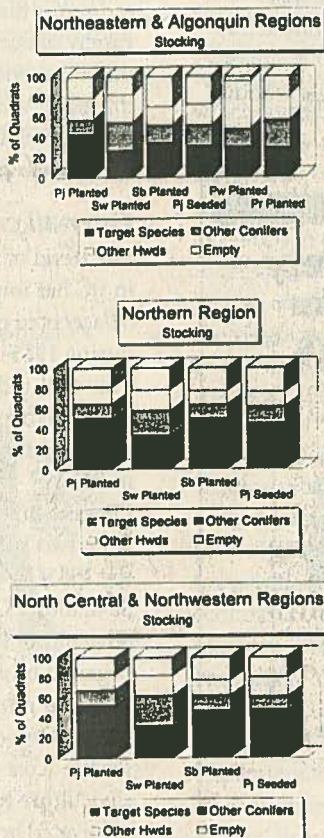
legislation which will have an impact on the nurseries.

Not the least of these policy issues is the development of ecosystem-based target and minimum stocking standards. In August, the OMNR released the second *Survey of Artificially Regenerated Sites (SOARS II)* in northern Ontario. The survey sampled 10- to 16-year-old planted and 15- to 20-year-old seeded sites. Most notable in the SOARS report is the fact that less than 50% of the areas sampled are stocked with the target species. Some have said that the main message of SOARS is "Tend!"

Such a dismal result is not an acceptable standard for Sustainable Forestry Agreements of the '90s. Forest companies, whose lands include some of the more challenging soils and ecosystems, cannot afford the poor success of plantations established between 1970 and 1985. They are going to have to procure the best possible seedlings and planting services, and this will change the seedling marketplace.

Because of the extreme competition between the northern Ontario nurseries for a diminishing number of seedlings in recent years, the OTSGA fragmented and fell apart. What took its place to some degree was the LUSTRE (Lakehead University Seedling and Technology Research Extension) Coop, a cooperative research program between industry, Lakehead University and OMNR.

At the January 1996 meeting of LUSTRE Coop growers, it would be wise for Ontario nurseries to again consider common interests beyond research and perhaps revive OTSGA. ♦



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BC silviculture safety reviewed

Dirk Brinkman

Note: This article is based on the 1994 WCB report Health and Safety Issues for Silviculture Camps and Operations in BC by Mark Bigham MD, MHSc and Ian Forbes, MD, MHSc. All quotations are from that report unless otherwise indicated.

Did you know that in 1993 "silviculture employers in BC contribute(d) approximately \$10 million annually in WCB assessment levies, while over \$1 million annually (was) paid out in WCB worker benefits"? While these statistics are not elaborated on, they are one of many facts and notions that emerged from *Health and Safety Issues for Silviculture Camps and Operations in BC*, an internal WCB study produced in 1994 by two UBC MDs with Masters in Health Sciences. The study is a comprehensive review of health and safety issues in the silviculture industry from the perspective of their specialised occupational and environmental health knowledge.

While this began as an extension of the 1993 WCB Silviculture Sub-committees work on camp regulations, the study was expanded to include non-camp silviculture health and safety issues.

The study is based on a literature review, interviews, un-announced sample visits to eleven camps with WCB inspectors, staff and worker interviews at those camps, and a review of WCB statistics from 1985 to 1993.

Some of the information brought to the surface in this report on BC indicates that the way the industry is being regulated and that the level of health and safety information within the industry require some radical changes.

The 1995 MOF booklet *Minimum Safety Guidelines for Treeplanters* is a by-product of the recommendations in this report. The booklet came out too late in 1995 to influence the health and safety conditions for that season. I encourage all administering foresters to see that workers in the camps of all contractors have copies of this booklet. It emphasises the worker's legal rights to safe working

conditions and outlines what those conditions are.

The importance of improving health and safety conditions within the silviculture industry is underlined by some of the findings in the WCB report.

Diseases

Due to the seasonal nature of silviculture work, "WCB statistics almost certainly underestimate the extent of occupational morbidity in silviculture." The authors found, anecdotally, that there was likely an under-reporting of illnesses (intestinal, insect related and other) with only 100 claims in eight years, because these may not show up until the worker is home or elsewhere. "In addition, a piece-rate system of worker remuneration is an economic disincentive to reporting a variety of occupational or other illness that the worker may attempt to 'work through'. Workers can often simply not work through musculo-skeletal injuries, so these are probably more accurate."

Over-all conditions improve

The trend of injury rates in treeplanting in BC has improved from an average of 38 accepted claims per 100 person years during 1985-87, to 23 during 1991-93. This 40% reduction in claims represents a considerable improvement in health and safety conditions for silviculture workers in BC.

I believe that this improvement resulted from two WSCA lobbying actions during the 1985-7 period, which produced the Silviculture Camp Standards and the Silviculture Regulation, both of which began to be enforced in 1987.

Few may remember that in the mid-'80s, the WSCA was the only group lobbying for the "cost-of-harvest" solution to silviculture funding. This lobby was motivated both by the desire to improve silviculture and because of the experience

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that MOF's low-bid auctions led to irresponsible labour practices. With normal market conditions, where company procurement decisions include the quality of the contractor's services, more responsible contractors were preferred, and health and safety conditions generally improved.

One percent time loss

Nevertheless, an analysis of the statistics during 1991-3 show that "work days lost to injury represents slightly over 1% of the total person days worked." This represents a tremendous loss of productivity cost.

A summary of the ten years of detailed WCB statistics reveals both some common themes and some distinct priorities are required to improve safety in silviculture.

Of course, in spacing, the number of injuries due to the chainsaw can be eliminated by eliminating the chainsaw, as has been done in the Scandinavian countries, and is now happening in the US Pacific Northwest. The computerised hydraulic robotics of the Single Grip or Cut-to-length Harvester shifts the main hazard for the operator from chainsaw cuts to Nintendo thumb.

Collectively, "caught, slips, falls" are the largest portion of injuries. Combining that with the body part with the most frequent injuries—the legs and feet—it is logical that improvements in footwear may bring the most reduction in injuries. More analysis of this data by knowledgeable industry insiders would be useful. For instance, when do the majority of the slips and falls occur—is it between 11 a.m. and 2 p.m. when people are getting tired because they have not taken much of a lunch break?

Silviculture camps

The authors observed there was a lack of employee awareness, training and attention to health and safety issues. They also found that camps were located in unsafe areas. They summarised MOF's 1994 spring audit of compliance with the Silviculture Camp Standards, which found that only 47% of 17 camps visited were adequate (less than four violations), three were borderline and six clearly substandard. The authors visited 11 camps in the summer, and there were more violations than the MOF audit. With a considerable portion of the illness claims going unreported, the importance of having WCB enforce the camp standards is underlined.

Transportation

"Motor vehicle accidents are the greatest hazard for occupational mortality among silviculture workers and are responsible for significant worker morbidity and economic costs to the silviculture industry. The authors' recommendations parallel the WSCA recommendations to MOF after 11 vehicle-accident deaths occurred in 1991 and deserve WCB implementation. The recommendations include designated drivers with class 4 drivers' licenses, off-road special training

and certificates of mechanical fitness. In August 1995, another planter was killed and several seriously injured in an accident.

Pesticides and herbicides

The authors quoted the 1986 COFI study that found that the three fungicides used by nurseries (benomyl, captan and chlorothanil) have all been linked with an increased incidence of cancer. They further quoted BC research contract studies of inhalation and skin absorption by planters, which showed low levels. These studies did not test for the

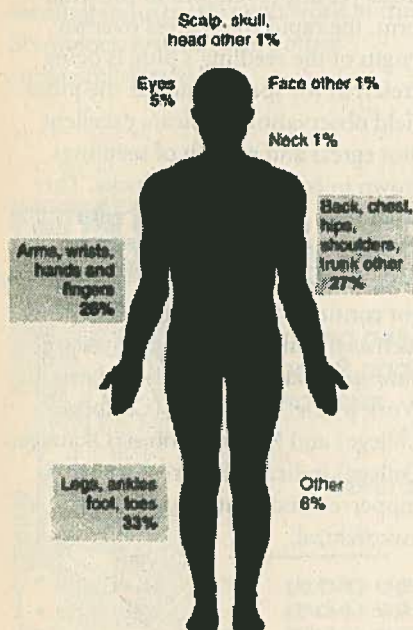
occasional high concentrations that occur, and the authors point out that higher levels of captan were sometimes associated with back-pack spraying of fungicides. They also quote Robinson, Trites and Banister's study on treeplanters' exposure to organophosphates and the side effects they measured on several occasions. These correlate to "anecdotal and documented reports of mild to severe allergic reactions in tree planters with acute exposure to unusually high levels of pesticide residue on seedlings.

"Silviculture workers can also be exposed to herbicide... if, for example, the 'restricted entry intervals' provisions ... of the WCB agriculture regulations ...are not followed."

The authors recommend protective clothing for planters, compliance with re-entry standards and "active" not "passive" notification.

"The goal should be to eliminate chemical pesticides to the maximum extent possible, where safer, effective alternative methods are available."

...motor vehicle accidents are the greatest hazard for occupational mortality among silviculture workers...



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MOF not seeking to register copper coating

Drew Brazier, Director, Nursery and Seed Operations Branch, BC MOF

Note: Edited letter to Dirk Brinkman, Aug. 11, 1995, in response to his letter on copper-coated seedling containers (CSM Summer 1995).

The BC Ministry of Forests (MOF) does not have a current request and never has requested the registration of any copper formulations for the purpose of controlling seedling root morphology. Agriculture Canada deals with such registrations not Environment Canada. The compound copper sulphate is not being used for the purpose of controlling seedling root morphology.

The MOF does not direct which forest seedling container will be used to grow seedlings for reforestation. The styro block system is the main survivor of a large number of possible containers that have been tried in BC. The styro block has simply been the most successful system. The MOF does not mandate any individual system, and those responsible for reforestation may decide to choose some other container. That they have not done so is a clear indication of a high level of satisfaction with the styro block-grown seedlings. In this regard, the choice of seedlings systems has been left to the market

place, and when successful innovations develop, those that offer superior performance over existing methods will be utilized.

This could involve the improvement of existing systems, or if sufficiently superior, whole new systems. If the reforestation system does not meet the standards of the Forest Practices Code, the licensee will be responsible for all costs necessary to achieve the standard.

Further concerns may be grouped into the following topics:

Copper formulation registration

The registration of copper formulation as a plant growth regulator is the responsibility of Agriculture Canada. Questions concerning this issue should be directed to the responsible party.

Nursery worker and planter safety

At the MOF nurseries, all necessary precautions are taken to ensure worker safety when treating containers with copper compounds. The copper compounds are mixed with latex paint before application. Suits are normally worn not because there is known risk, but simply because the paint would soil clothing.

The suggestion that seedlings grown in copper-coated containers be classified as pesticide-treated is preposterous. The seedlings do contain slightly elevated copper levels but within the levels for normal growth. It is inconceivable how copper levels that produce healthy plant growth could constitute any risk to the tree planter.

Recycling

Many nurseries use the copper-treated containers until the copper level is so low that the seedlings' root systems are not adequately controlled. Some nurseries have used the ground

copper treated containers as a container seedling media amendment without having any detrimental effect of seedling growth. As with all waste issues, innovative solutions are being developed to deal with each problem as it is recognized.

Environmental concerns

The question of runoff from nurseries of all kinds is being reviewed by the Ministry of Environment (MOE). Runoff from nurseries contains fertilizer that can constitute an environmental hazard depending on the level of fertilizer ions. Copper, like other plant nutrients in low concentrations, does not constitute an environmental hazard but in higher concentrations can, especially to fish. The MOE will set standards that the forestry, horticultural and agriculture industries will be required to meet.

Benefits of copper

The benefits of copper on seedling root morphology and growth after planting has been debated in many forms. The increasing demand for seedling grown in copper-treated containers, especially for lodgepole pine, is testimony to the benefits and value that field practitioners attach to seedlings grown in copper-treated containers. Any benefits to root form in the long-term affect on growth and seedling stability are as yet unproven, but in the short term, the rapid root egress over the length of the seedling's plug is being preferred for species such as the pines. Field observations indicate excellent root egress and growth of seedlings grown in copper-coated blocks. This rapid root growth along the entire plug is a clear indication that the root-inhibiting effects of copper treatment do not continue after planting. Questions such as the impact of mycorrhizal are pure speculation and without basis. Work by Dr. Gary Hunt (Cariboo College) and Melaney Jones (Okanagan College) indicate that trees grown in copper-coated containers are fully mycorrhizal.

...MOF does not direct which forest seedling container will be used to grow seedlings for reforestation...

Questions as to whether air-pruning is superior to copper treatment will require time to answer. As with any industry, the evolution of methods is constant and the current method used is the best available. The BC reforestation industry has experienced enormous change in the past, and the change for the better will no doubt continue. Work has been done on air-pruning and more will be done in the future. This could be facilitated by the production of an alternative block type that is the same size as the current styro block. Ultimately any alternative system would have to offer superior benefits from the current styro block system to gain widespread acceptance.

MOF role in reforestation choices

The MOF currently uses primarily seedlings grown in Styroblocs because this growing system offers low cost seedlings and good field performance, and has proven reliable over many years. The forest companies make their own choices as to the seedlings they purchase to fulfill their reforestation responsibilities. If a superior system is developed, then no doubt different choices will be made. The Nursery and Seed Operations Branch has and will continue to support the current forest seedling industry through work in the Styrobloc system or any other successful system. ♦

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Ergonomics

Citing Smith who found that treeplanters work at 60% of their Physical Work Capacity, the authors note that the "level of task energy expenditure is almost double the American Industrial Hygiene Association's recommended maximum level for an eight-hour shift." Trites found that inexperienced planters—with their heart beat of close to 140 bpm—were working at "almost 70% of maximum work capacity for the entire day.

"WCB statistics for silviculture workers reveal a preponderance of musculo-skeletal injury. (For) 1991-3, musculo-skeletal injury represented about half of all claims, two thirds of disability payments, and over 85% of work days lost among silviculture workers."

Consequently, it is not surprising that the authors recommend that "the silviculture industry initiate a comprehensive ergonomic assessment, and implement necessary changes to eliminate or control ergonomic hazards," many of which they identify.

Remuneration

"There is some suggestion that ...piecework ...may contribute to the health and safety hazards of silviculture work... Piecework may discourage workers from taking recuperative breaks throughout the day, with the attendant risk of chronic fatigue, overexertion, and injury, or even improperly attending to personal hygiene."

The authors conclude the executive summary by expressing the "opinion that the health and safety of silviculture workers would be enhanced by fully integrating forestry operations so that those who harvest trees are directly responsible and accountable for all aspects of silviculture...."

That recommendation, which would restructure the entire industry, is currently reflected in the direction of FRBC's silviculture program towards local unionised employment programs. On the other hand, when forest companies have to pay, they look for least cost/best value, so the piece rate is here to stay.

A more responsibly managed piece-rate pay system would include the collateral damage of planter injuries in prices for large (1'X1') screening, instead of spreading the added costs of injuries on difficult screening blocks over all planting through higher WCB rates. Appropriately costing injury risk into pricing of difficult work could only arise from a more thorough study.

While this is the best summary and analysis of health and safety issues in silviculture to date and is a useful guide for focusing the priorities of a contractor or association seeking to improve working conditions and productivity, it just begins to scratch the surface of the issues in a rapidly growing industry where continual avoidable injuries and deaths demand, with increasing urgency, that these problems receive further



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Alberta WSCA changes timber management classification

Jeff Reynolds, Alberta WCB

Each year, the Alberta WCB is responsible for calculating premium rates that will easily fund the cost of accidents. As in all Canadian jurisdictions, the Alberta WCB follows an industrial classification system rather than an occupational-based system. It is the collective risks of an industry that determine premium rates from year to year.

Certain industries in Alberta are very small and unable to withstand the impact of costly claims. For this reason industries are grouped together to form Rate Groups. Premium rates are set at the Rate Group level. Rate Groups range from having a single large industry to many smaller (and less predictable) industries.

For 1996 rate setting, the Alberta WCB has provided a rate setting structure that promotes rate stability and predictability. To achieve this we had to ensure that, from an actuarial point of view, each Rate Group was statistically credible. In doing so, the WCB is able to eliminate or reduce rate capping and subsidization; as well, smaller industries are afforded the protection that can be gained by being grouped with larger, more stable insurance groups.

In the past, the WCB has capped annual rate increases for industries. While this prevented dramatic rate increases from year to year, it also contributed to an unfunded liability where essentially the WCB could not collect enough premiums to pay out the fully funded cost of claims.

Industry 03902, Timber Management exists as the sole industry within its rate group in 1995. It was identified as being one of 29 Rate Groups requiring consolidation for 1996. As is demonstrated in the following table, the premium rate has often been capped at the maximum allowable change. In 1995, the first year depicted in the table, no caps were required.

YEAR	1988	1989	1990	1991	1992	1993	1994	1995
RATE	\$2.31	\$2.89	\$3.61	\$4.51	\$5.64	\$6.49	\$7.49	\$5.71
CHANGE	-25%	+26%	+25%	+25%	+15%	+15%	-24%	

Alberta WCB Timber Management rates and annual increases

Timber Management consists of the following activities: log scaling, timber cruising, regeneration surveys, cut block layout, cone picking, stand tending and planting.

A conservative estimate would attribute at least 75% of industry payroll to treeplanting alone.

To address the volatility presented by Industry 03902, it will be grouped in the same Rate Group as Industry 03100, Logging, Woodlands Operations for 1996. The premium rate for logging has fallen from a high of \$15.23 in

1988 to just over \$6.00 projected for 1996.

For insurance purposes, all woodlands activities from timber cruising to logging will form one Rate Group in 1996. In performing this consolidation, the WCB had to consider the forestry nature of both logging and timber

management. While the risks presented within each industry differ, it is a common practice to keep Rate Groups representative of broad industrial activities. As with the oil or construction industries, various components present different risks, yet for rate-setting purposes are consolidated within homogenous rate-setting groups and are held collectively liable when setting

annual premium rates.

The WCB isolates the cost of claims into four categories

during rate-setting: compensation, medical aid, permanent disabilities and fatalities. Typically, with timber management, it is the pure compensation costs that have been driving the premium rate. This is characteristic of what one might expect in a seasonal, piecework type industry. Claims with tree planting tend to be short-duration repetitive-strain injuries whose total costs are captured within the five-year window used in setting premium rates.

With timber management, there was also the unfortunate accident in 1990 that resulted in seven fatalities. Even with aggressive cost-relief measures that the WCB employs in such disasters, these fatalities have had a serious impact on the rate for timber management.

In summary, Industry 03902, Timber Management has been identified as being too small to stand alone for rate-setting purposes. For 1996 rate-setting, Timber Management will be consolidated with Logging, Woodlands Operations. In doing so, the WCB is able to enhance the statistical credibility and stability of the rate-setting group while providing the intended protection for forestry employers. ♦

...the unfortunate accident in 1990 that resulted in seven fatalities had a serious impact on the rate for timber management...

Bear and wildlife attacks

Kent McDonald, WCB Regional Manager, North Region, Prevention Division

Note: Edited from a letter to BC silviculture contractors, July 25, 1995.

A WCB-called meeting brought together representatives of the silviculture industry in Prince George June 5, 1995. Others at the meeting included WCB personnel and representatives of the BC Ministry of Environment and Parks, and the Canadian Association of Geophysical Contractors.

Premise of the meeting

Each year in every phase of the silviculture industry, workers are exposed to the potential of encounters with bears or other wildlife. Indeed, several bear or wildlife attacks and maulings are recorded each year. Mechanisms available to reduce the potential of such encounters include:

- (a) worker education and training through the provision of information with respect to bears and wildlife;
- (b) provision of written procedures to enable workers to clearly understand what is expected of them in response to bears and wildlife frequenting the silviculture sites and camps;
- (c) effective communication between fellow workers and supervisors; and
- (d) intensive supervision to ensure workers are following established procedures and silviculture sites and camps are effectively monitored for bear and wildlife activity.

A few silviculture firms have done some work with respect to developing procedures and training workers. In general, as in industry, there is little being done with respect to this problem.

The industry must take the initiative to address the risk of bear and wildlife encounters. The WCB will develop inspectional protocols for its safety officers.

Anticipated action

The WCB encourages involvement from the industry in developing safe work procedures and other initiatives required to work safely in areas frequented by bears and wildlife.

Ideally, this involvement would mean the industry associations (e.g., WSCA) would, in conjunction with the WCB, develop standard, safe work-procedures. These standards could then be adapted or personalized to each company, and subsequently, to each silviculture operation.

To a lesser degree, this involvement could mean that small groups of companies, in conjunction with the WCB, develop these standard, safe work-procedures. This approach is seen as less desirable as it does not allow for input from all segments of the industry.

The third and least desirable approach would mean that each company, in conjunction with the WCB, would develop their own safe work procedures. This approach is seen as the least desirable because it tends not to involve the wide range of experiences of the industry and could lead to inconsistencies in procedures.

A fourth option would be considered if no input is received by the WCB from industry. The WCB would develop a safe work-procedures audit with the expectation that industry would conform to the procedures. This, in effect, would establish the minimum standard to which industry would be required to comply.

The WCB will develop inspectional protocols for its occupational safety officers. These protocols will be utilized starting in the spring 1996 silviculture season. Safety officers will conduct specialized inspections (as part of regular workplace inspections) to ensure each firm has active and effective bear-and-wildlife awareness training programs in place. Orders will be written where deficiencies are identified.

Timetable for action

October 1, 1995

- if requested, the Board will begin work with the industry on procedures being developed that are currently in place
- by this date, the industry should have begun work on developing upgrading procedures; industry associations or individual firms are encouraged to forward their procedures to the WCB for review

October 2, 1995

- a follow-up letter to be sent
- it is anticipated that

industry will approach the board with a request for joint development of a bear-and-wildlife awareness and training standard

January 1, 1996

- individual firms would be expected to complete procedures in readiness for the 1996 season

April 1, 1996

- the WCB will utilize inspectional protocols to ensure each planting site and camp have effective procedures in place with respect to bears ♦

...the industry must take the initiative to address the risk of bear and wildlife encounters...

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Bear mauls planter

Last May, an 18-year-old BC treeplanter was attacked by a black bear on his first day on the job. The bear charged Daniel Marchuk as he was walking across the campsite and knocked him down. Marchuk was able to escape with the help of his cousin but he suffered severe puncture wounds to his back and lacerations to his head. — *Vancouver Province*

Foresters migrate into BC paper forest

During 1995, BC MOF and the BC forest industry combed across Canada to hire additional foresters to manage the proliferation of bureaucracy surrounding the new Forest Practices Code. The Ontario Professional Foresters Association reports 55 members transferred and 37 resigned, many as a result of moves to BC. The majority of 1995's graduating foresters from across Canada went to BC. However, do not expect to see more foresters working in the bush: they were all hired to work in the new paper forest NSR (Not Sufficiently Refilled) backlog. — *CSA*

Ozone levels dropping faster than ever

The World Meteorological Association has announced that the ozone decline over the Antarctic, which started at the end of July 1995 and continued through early September, was the most rapid depletion on record. The area with severely depleted ozone presently covers 10-million square-kilometres (about the size of Europe), with 63% lower ozone levels than the historical average. The ozone "hole" is twice the size (and with 10% lower levels of ozone) compared to the same period in 1994—which was the worst year on record. BC researchers recently conducted an experiment, exposing spotted frog embryos to levels of UV-B predicted for BC in the next decade. The hatching rate decreased approximately 35% over embryos exposed to current UV-B levels. — *WMO and CSA*

UN panel predicts global warming apocalypse

The UN-sponsored International Panel on Climate Change (IPCC) has declared there is definitive scientific evidence that human activity is at least partly responsible for recent warming in the earth's climate (seven of the ten hottest years of the century have occurred in the last decade). Although individual scientists have made this claim before, it's the first time the IPCC, made up of more than 1,500 leading climate experts, has officially taken this position. The IPCC's draft report predicts that sea levels will rise one metre over the next 100 years, submerging vast areas of low-lying coastal land and displacing more than 100 million people. As temperature and rainfall patterns shift unpredictably, as much as one-third of the world's forests may find themselves living in the wrong climate. — *Time Magazine* ♦

Ontario Boreal Forest Management

Working within the context of today's realities and challenges (e.g., the new Crown Forest Sustainability Act), this workshop will provide increased knowledge of ecosystem structure, composition and function — as well as insights into necessary tools and practices.

Theme: Advancing boreal mixed wood management

Location: Sault Ste. Marie, ON

Date: October 17-19, 1995

Contact: (705) 949-9461

Ecological Economics

This five-day workshop introduces the field of ecological economics. Herb Hammond, author of *Seeing the Forest for the Trees*, will teach analysis based on the real costs and benefits of various economic and ecological activities.

Location: Nelson, BC

Date: Nov. 20-24, 1995

Contact: (604) 226-7222

Conservation of Northern Forests

Forests in all parts of the world are under unparalleled pressure to reconcile increasing global demands for fuel, fibre and timber with conflicting needs for preservation of forested lands.

Theme: Responsible stewardship for the future

Location: Toronto, ON

Date: Nov. 27-Dec. 1, 1995

Contact: (416) 978-5750

Genetics Education for Northwest Ecosystems

Concentrated course on the practical application of applied genetics to management of genetic resources in forested ecosystems of western North America.

Theme: Genetic implications of current/alternative silviculture regimes

Location: Spokane, Washington

Date: Feb. 5-9, 1996

Contact: (509) 335-3530

1995 ABCPF Annual Meeting

This three-day meeting for the Association of BC Professional Foresters focusses on the issue of professional interaction, including conflict resolution and team building.

Theme: A united profession

Location: Richmond, BC

Date: Feb. 14-16, 1996

Contact: (604) 662-2706

Forest Insect Management Course

The course is designed to advance the skills and knowledge of forestry professionals in current techniques for planning, implementing and evaluating forest-insect management-programs within the broader context of integrated resource management.

Location: Sault St. Marie, ON

Date: Feb. 1996

Contact: (705) 757-5740 ext 2251

To list your event, please send your correspondence to:
Canadian Silviculture Magazine, 4-1825 Nelson Street, Vancouver, BC, V6G 1M9 or fax (604) 875-1403.