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Publisher Joyce Hayne
Sales Manager Marie Richards
Editor Dirk Brinkman
Contributing Writers John Betts / Cori Barraclough
Dirk Brinkman / Gaston Damecour / Leslie Habetler
Wanson Hemphill / Patrick Lucey / Allen O'Brien
Fabien Simard

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CANADIAN SILVICULTURE

COVER STORY

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The emergence of the bioeconomy will pave the way to an unprecedented expansion of the forestry sector by opening new markets and offering new perspectives on the way forest resources will be managed.



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As pressure on our water resources increases, we must ask how our land management practices can be improved to protect stream and wetland integrity and prevent these extreme conditions.



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The vision of the World Forestry Congress is sustainable forest management in natural forests as well as conservation that ensures the preservation of the world's forest ecosystems.

A federal opportunity for revitalizing provincial forestry

by Dirk Brinkman

In October 2003, Canada bought \$15 million in eucalyptus afforestation in Brazil through the UN's Prototype Carbon Fund. These Brazilian plantations, that are grown to be cooked into char for smelting steel, create a carbon sink value from having forest fuel replace fossil fuel - coal.

When forests burn, they emit greenhouse gases (GHGs). After trees die from fire, pests or disease, the dead trees and burnt forest floor continue to release CO₂ and other GHGs into the atmosphere for many years.

Canada committed to reduce its national carbon dioxide (CO₂) emissions to 6% below 1990 emissions from 2008 to 2012. This requires a reduction of 240 MTmega tones (MT) CO₂ from projected levels by:

1. reducing industrial (or personal) emissions
2. sinking carbon into new forests or
3. buying reductions or sinks in developing countries.

Canada negotiated hard for the right to sequester (sink) 44MT of its CO₂ reductions (20% of 240MT) into managed forests. Managed forests are- the area we harvest, reforest, tend and protect against fire, pests and disease. Canada has to decide, by 2006, if it will use the which managed forest sink and in which land area. The risks of fire, pest, disease and weather all make choosing the managed forest a difficult decision.

To create a minimum maximum carbon price certainty, the federal government committed to topping up any prices to capping the price at \$15/T CO₂—known as the cap price. There are other However, some of the options in Canada's Global Warming Plan which will may cost the federal government over \$65/T CO₂. When forests burn, they emit greenhouse gases (GHGs). After trees die from fire, pests or disease, the dead trees and burnt forest floor continue to release CO₂ and other GHGs into the atmosphere for many years.

Each decade some forest catastrophes concentrate these risks in a few provinces,

chosen seemingly at random. In 2003, BC was that province. Until 2003, forest carbon models indicated BC's forests were sinking absorbing 48MT of CO₂ per year. By 2003, high forest fuel accumulations, warm winters, dry summers and 'business as usual' forest management practices resulted in three forest catastrophes. The worst fires in 20 years burned 255,000 hectares; pine bark beetles girdled another 2 million hectares; and dophistroma killed 35,000 hectares of young pine. As a consequence, BC's forests risk becoming may now be a net source of CO₂.

Surprisingly, it may be that these dead forests offer the best opportunity for a federal provincial carbon transaction. Catastrophes offer large-scale carbon management opportunities.

In the normal course of business, BC would salvage only 25% of disturbance kill and would not reforest the remaining area. If the federal government funded a more aggressive program of salvage and restoration of these areas, that could buy the avoidance of the emissions from the dead trees and the carbon absorbed into the reforestation. It would qualify as being additional to BC's 'business as usual', a condition to qualify carbon sinks or emission avoidance.

In summary, here is how it could work. Forest sink carbon is discount priced because of future risk and uncertainty. Present prices are consequently discounted from the future price. Under the terms of the Global Warming Agreement, assuming a \$15/T CO₂ cap price for future carbon is discounted to the present, these qualified actions can generate the following values:

A. If the managed forest area including the catastrophic mortality is included: using the \$15/T CO₂ discount price, the following qualified actions can generate:

- Before December 31, 2007, salvage the dead trees for timber production and avoid having them decay in the managed forest during the commitment period for timber production. Good till - wWorth potentially

\$600900/hectare at a 4% discount rate.

- Salvage dead trees for green energy, replacing fossil fuel. Good till at least 2012. Worth potentially \$600/hectare.

3. Reforest to reduce the natural regeneration lag and absorb carbon through faster growth - good until at least 205012 and w. Worth potentially \$1,000150-\$250/hectare at a 4% discount rate.

B. If the managed forest is not included:

- Salvage the dead trees for green energy that would otherwise decay, replacing fossil fuel - good until at least 2012 and worth potentially \$600/hectare (not discounted as a current transaction).

Given the scale of BC's forest catastrophes, a federally funded carbon transaction could put \$500 million to \$1 billion into managing the province's mortality areas. However, carbon value does not work on its own does not support to drive treatments or management. Neither do forest products alone support intensive spacing, as the forestry sectorsilviculture industry has discovered the hard way. The challenge for each province is to integrate carbon into the other values and forest users.

Unfortunately, before 2012, other provinces will have had their share of forest catastrophes-- especially in an age of global warming and climatic extremes. Canadian Silviculture CSM challenges Canada to set create a precedent for with this kind of transaction. Unfortunately, before 2012, other provinces will have had their share of forest catastrophes - especially in an age of global warming and climatic extremes. Let the cruel hand of fate distribute the new carbon value to afflicted provinces that need it, and let these provinces earn it through the salvage and restoration of their forest catastrophes.

We look to the federal government will to negotiate a a carbon transaction pool for managing forest catastrophes. Not only will this insurance provinces against future catastrophe management cost volatility, adding carbon and energy markets may revitalize marginal forest sectors.



Canada's Forestry Sector & The Bioeconomy

by Luc Duschesne

As always, it is raining in Deer Lake, Newfoundland. Darcy Major stands in the mud, inspecting a load of 2 x 4's as they come out of his antique 10,000,000 bf/year sawmill. He has been the owner operator of one Newfoundland's small sawmills for the past year and he worries about the future of the industry. The lumber tariffs and the climbing dollar are taking a toll on his bottom line. He wonders what the future has in store for his thirty-seven employees. Near Vancouver's airport, at DynaMotive's headquarters, in-

vestors are enquiring about fluidized bed reactors that turn waste biomass into fuel oil and char.

On the 34th floor of a Bay Street high rise, stock analysts aggregate around the water fountain and chat nervously about the fate of the pulp and paper industry as the rising cost of energy is chewing up profit margins.

A downtown Winnipeg hotel is the temporary home of First Nation leaders devising new strategies to create employment and improve the economies of many northern

reserves. How can they bring industrial activities in places where diesel has to be flown in to fuel an electrical generator?

In Kelowna, BC, a logger stares at the burned over mountainside. Depression sets in as he ponders what will happen with all the wood left by the 2003 fires. It would be such a waste to let all this material rot.

A hundred or so grim faced economic development officers in Kenora, Ontario attend a meeting to elaborate on new strategies to create

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the **bioeconomy**

is expected to tap into markets in excess of \$100 B



The valuable drug Paclitaxal is produced from cell cultures of ground hemlock.

Tremblay brings in a load of wild blueberries to the local coop, wishing he had access to more land to manage blueberries to meet the rising demands of the highly priced wild fruit. He wishes he could turn a thousand hectares of jack pine into blueberry farms. With luck he could make as much as \$1000 per hectare per year but that would put him in direct competition with the forest industry and put people out of work. A young woman in a lab coat makes use of her PhD training in a Montreal biotech lab as she attempts to coax cell cultures of ground hemlock to produce the valuable drug Paclitaxal. The drug is used in the treatment of ovarian and breast cancer and is worth as much as \$8M per kg in its prepared form. Currently the drug is extracted from wild material and pickers make as much as \$200 per day harvesting wild ground hemlock to feed into an industry that is gearing up for a \$10 B market for this drug alone. But how long will this resource last in view of the increasing market for paclitaxal? Willingly or not, these folks have one point in common: they will become

jobs in replacement of those lost by mechanization of forestry operations. They place a hesitant hope on non-timber forest products (NTFP) but are stuck as to how they will turn a cottage industry into a mainstream economic activity.

In a bland and gray government tower of Ottawa's Booth Street,

high-level bureaucrats brainstorm about what measures the Federal Government should take to salvage the Canadian economy when the world's fossil fuel reserves are exhausted. The problem is that no one is exactly sure if it will take place in forty or sixty years.

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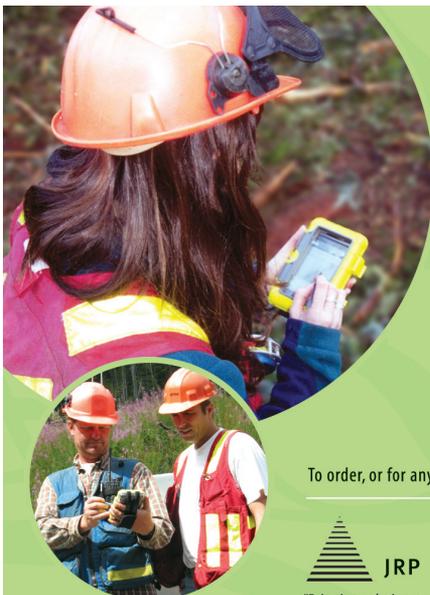
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TABLE 1

The markets of the Bioeconomy

Biofuels	\$80 billion	(Canada)
Bioplastics	\$10 billion	(Canada)
Pharmaceuticals from plants	\$40 billion	(world)
Pest control agents	\$1 billion	(Canada)
Natural products	\$100 billion	(world)
Foods from the forest	\$675 million	(current Canadian production)
Consumer goods (Christmas trees, arts and crafts)	\$125 million	(current Canadian)



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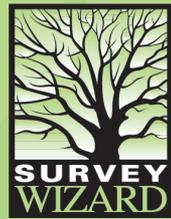


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Bioproducts can be used in manufacturing processes.

participants in the bioeconomy, the next economic trend, which according to the gurus, will change the face of the Canadian economy along with that of all other industrialized nations. In Canada alone the bioeconomy is expected to tap into markets in excess of a \$100 billion (Table 1).

The bioeconomy is expected to replace the current information economy within the next twenty-five years. It will be based on life sciences and will draw on biomass and Canada's genetic and species diversities by integrating processes and knowledge derived from the biotechnology and manufacturing sectors.

Now the bioeconomy is a critical issue to Canada's forestry sector. Because it will need huge amounts of feedstocks, the emergence of the bioeconomy will pave the way to an unprecedented expansion of the forestry sector by opening new markets and offering new perspectives on the way forest resources will be managed. To put it simply, we can expect forest resources to increase in higher demand, as they become favoured sources of energy, plastics, manufacturing products, pharmaceuticals, nutraceuticals, foods and consumer products.

The commodities traded in the bioeconomy are termed bioproducts because they are derived from all types of living organisms: plants, animals, insects, viruses, fungi and bacteria. The list of materials and products that can be made from renewable biological resources instead of petrochemicals is impressive: fuels, adhesives, solvents, plastics, paints, fabrics, fertilizers, pesticides, lubricating oils, biodegradable packaging, composite construction materials, value-added wood products, pharmaceuticals, nutraceuticals, and a plethora of other consumer products from all aspects of Canadian life.

In some ways the bioproducts industry is as old as humankind. Throughout history, humanity has depended on plants and animals for food, shelter, medicines, tools and clothing. But the bioproducts industry is now made possible by new knowledge and processes in the fields of chemistry, wood processing, pharmacology and biotechnology. As well, market globalization and the need to gradually fade out the use of fossil fuels create economic incentives that are favourable to the bioproducts industry in such



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varied fields of application as medical sciences, energy, housing, transportation, food sciences, cosmetics, manufacturing processes and many other aspects of everyday life.

Economies tend to be cyclical and the bioeconomy represents the latest of the economic cycles that have marked humankind. Through the Paleolithic era hunting-and-gathering



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The value of the Canadian Blueberry harvest is \$207 M/year.

economies ruled for hundreds of thousands of years before they were replaced by agrarian economies, which dominated for 10,000 years. Next the industrial economies took over across the western world and displayed several cycles of their own. The first industrial economy began in Britain in the 1760s. In the United States, the industrial economy started to unwind in the 1950s and is being replaced by the information economy. But the information technology era is expected to last for 75 to years, ending in the late 2020's. Then the bioeconomy will dominate until its progressive replacement by the next wave. Interestingly, we have yet to figure out when the bioeconomy will

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forests will be viewed as a source of
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be replaced by the next wave. Regardless of how long it will last, the bioeconomy is expected to have profound effects on our society and culture, as it will produce goods and services for all sectors of the economy.

As far as the forestry sector is concerned, the bioeconomy will take shape in two forms. On the one hand, there should be a diversification of biological products managed from forest ecosystems such as non-timber forest products (NTFP). In recent years, NTFP have received a great deal of attention as tools to diversify rural, northern and First Nation economies generate sustainable forest communities and subsidize industrial forest operations. Our forests will be viewed as a source of raw material for all sectors of manu-

facturing, not just the lumber and pulp and paper industries. There is a growing number of industries that demand that we manage new commodities from the forests, going from blueberries to the valuable ground hemlock. In future, it's a safe bet to assume that everything in the forest will become a commodity.

On the other hand, there should be increased application of biotechnology in biomass processing which will yield new markets and improve the economic and environmental efficiencies of current industrial applications. Plant biomass can be processed and converted by fermentation, pyrolysis and other processes into chemicals, fuels and materials that are collectively termed bioproducts.

With a Canadian energy market in excess of \$80 billions/year, biofuels

(fuels derived from biomass) have the greatest potential of all bioproducts. There are a number of alternatives: ethanol, electricity through cogeneration and bio-oil.

For a fuel, including biofuels, to be useful to anyone it must three basic requirements: 1) it needs to be storable efficiently—which is the reason electricity is turning out to be a problem as it cannot be stored, 2) it needs to have sufficient energy density to be moved cheaply, and 3) it needs to be produced cheaply.

The reason why crude oil is such a valuable source of energy is that it is cheap, it can be stored effectively and it can be shipped cheaply. In contrast, forest biomass is at the other end of the spectrum: it is expensive to extract, it cannot be

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Ground Hemlock is a frequent understorey shrub in eastern Canada's hardwood stands and offers new business opportunities.

stored well for long periods of time and is very costly to move around. In theory, a cord of wood contains the energy of two barrels of oil, which is enough to run a fuel-efficient car for a year. But putting the energy of a cord of wood into a car is problematic. Biomass is very expensive to move around because of its bulk weight. As well, the classical cogeneration strate-

gies to generate electricity aren't practical as transmission lines are notorious at losing power. Therefore, forest biomass needs to be transformed into a condensed form of energy that can be transported over long distances. Ethanol, which is generated through the fermentation of wood, is still too expensive at roughly \$15 dollars per gigajoule of energy—the cost of natu-

ral gas ranges between \$5 and \$10. There are economically proven pyrolysis systems that can extract nearly ninety percent of wood's energy at low cost. For pyrolysis to take place, biomass is exposed to high temperatures in the absence of oxygen. The resulting product is called bio-oil. In turn, bio-oil resembles crude oil and offers the same advantages in terms of low cost, transportability and storage. It might well emerge as the base fuel of the future from biomass.

But what does this all mean to the forest industry, which is stuck between a rock and a hard place, fighting the raising dollar and lumber tariff?

For one thing, the bioeconomy will force the forest industry to restructure. First and foremost, there will be increased pressure to co-manage all commodities from the forest. We will have to manage ground hemlock under maple stands because in some cases it might be more economical to harvest ground hemlock at \$200/ha/year than timber values at \$100/ha/year. In fact, Dr D. DeYoe of the Ontario Forest Research Institute suggests that NTFP management may be used to subsidize silvicultural operations. After all, cost is the great-



Tom Sentes
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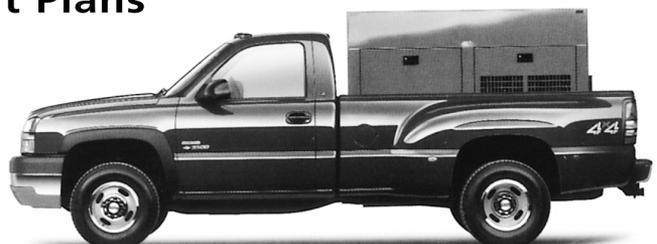
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est impediment to early plantation silviculture in Canada. With a little help from NTFP, it may be possible to make it the more viable.

The other, and perhaps more critical impact of the bioeconomy on forestry, is whether or not it will muscle itself in the forest industry's classical supply chain. The short version is yes, but don't hang up your chainsaw yet. It might take some time. Analysts predict that there may be a time, when the price for crude oil goes beyond \$100, when trees will be worth more as a source of energy than paper or lumber. This point will come when market forces start kicking in response to a decline in world's fossil fuel reserves.

The bioeconomy is coming; there is no doubt. It will be precipitated by our hunger for energy and the oncoming shortage of fossil fuels. The bioeconomy will change our lives and change the way we look at our forests as bioproducts will be necessary to maintain our way of life. How will we position ourselves as a forestry nation? And more importantly, how will the forestry sector prepare itself?

After fibre supply and lumber tariffs, energy security will become the more critical factor facing the forest industry in the future. It may play for or against the forest industry depending on how it will position itself.

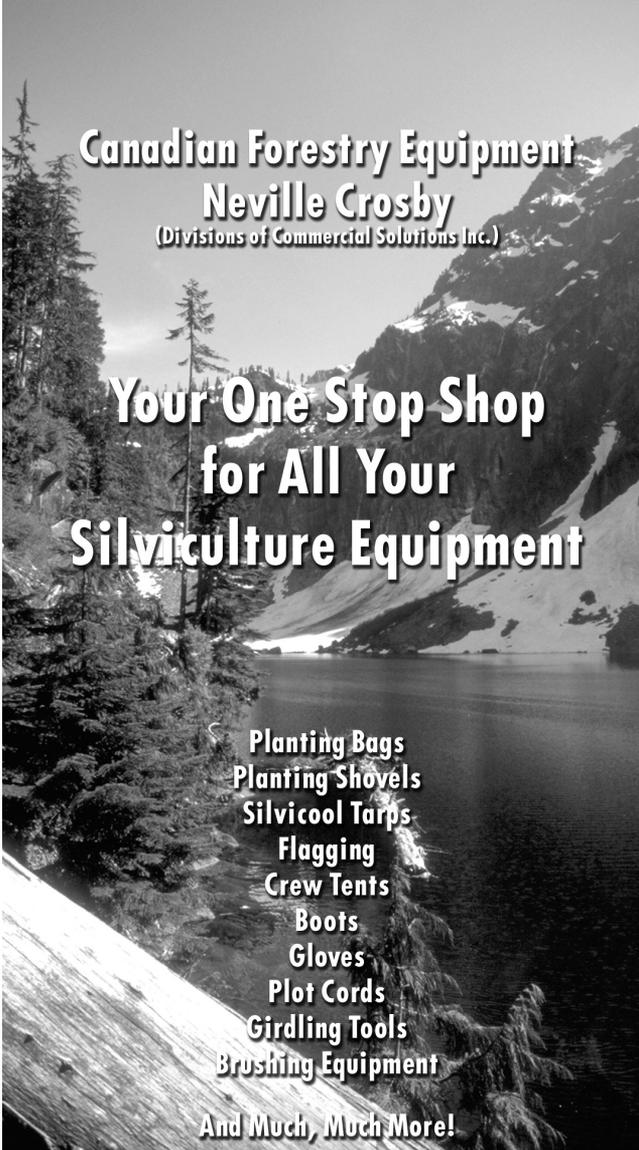
Luc Duschesne is Chief Forester at DynaMotive Energy Systems Corporation and can be reached at luduches@NRCCan.gc.ca. Suzanne Wetzel is a Research Scientist at Natural Resources Canada, Canadian Forestry Service and can be reached at swetzel@NRCCan.gc.ca

Correction

The figures in the Site Preparation article, in the summer issue of Canadian Silviculture, were labeled incorrectly.

Figure 3a should read 4, Figure 3b should read 5, Figure 4 should read 3a and Figure 5 should read 3b.

Please accept our apologies for the confusion.



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Forest Hydrology



By Cori L. Barraclough
and Wm. Patrick Lucey

Canada is home to 25% of the world's freshwater, yet three years of drought in British Columbia have caused streams to go dry, wetlands to shrink and communities to implement water restrictions. Devastating forest fires destroyed thousands of hectares of forest in the summer of 2003 and torrential rainfalls have torn river channels apart as they received more water than they could handle. As pressure on our water resources increases, we must ask how our land management practices can be improved to protect stream and wetland integrity and prevent these extreme conditions.

The need to protect freshwater ecosystems has long been recognized, but managers and policy makers continue to struggle with the best way to accomplish this. Perhaps the reason why management is so difficult is that we continue to focus upon managing for values rather than for function. For example, fixed-width riparian buffer zones are entrenched in many pieces of BC legislation including, amongst others, the Forest Practices Code Act, the Forest and Range Practices Act, and the Streamside Protection Regulation. The fixed buffers are an attempt to provide a standardized, inexpensive, administrative means of protecting the channel, but their width may be entirely dependent upon whether or not the stream contains fish (a value). Values are

derived from systems that are healthy, or in "proper functioning condition". Non-functional systems provide few, if any, values. If the function of a stream is to move water and sediment across the land in balance with the landscape (i.e. landform, geology, bioclimatic region), then basing the width of riparian protection area on fish presence, rather than on landscape features, appears doomed to fail.

In order to protect stream function effectively, one must first understand how streams work. Stream channels are formed by the flow of water and the

load of sediment they carry. The amount of water and sediment moving through a watershed depends on climate and geology. When precipitation falls on the upland areas, it is captured by soils and vegetation, infiltrated into the ground and slowly moved downslope where it is released into the stream. The vegetation along the stream (riparian vegetation) slows the flow of water, captures sediment, and builds stream banks, especially during flood events. Flooding is nature's way of dissipating energy, renewing soils and keeping water on the land as long as possible.



Mark Creek watershed, City of Kimberley (Aug 2003). The old road encroached on a small tributary to the drinking water supply (right) and prevented it from accessing its floodplain and dissipating energy. Logs were carefully levelled, spaced evenly across the old road bed and anchored with their root balls. The stream can now access its floodplain (old road) and the logs will slow the water, trap sediment and promote vegetation growth. A multiple-culvert array was installed in the new, elevated road to allow water to flow across the road without being concentrated and causing erosion downslope.



Blenkinsop Creek, Saanich BC. A completely new stream channel was built using the seventeen PFC processes and attributes as the design criteria. The stream was moved out of a ditch and restored to its functional condition.

This process of capturing, storing and slowly releasing the water ensures that the channel does not receive more water than it can handle during storm events and also provides water to the channel during the dry summer months as the riparian sponge slowly discharges its moisture. Streams heal during droughts as riparian plants grow in toward the channel, filling in bare spots and preparing to capture sediment during the next runoff cycle. In a healthy stream, there is a dynamic balance between streamflow forces and channel aggradation /degradation processes, so that the channel adjusts in form and slope to handle increases in stormflow or snowmelt with minimal disturbance of the channel or riparian plant communities. From a management perspective then, the width of the stream protection corridor must consider hydrology, geology/soils and vegetation to effectively maintain stream health.

A consensus answer to the question "what is a healthy stream?" has plagued managers for decades. Filing cabinets full of data on stream length, width, flow, soil moisture, vegetation types, fish species and invertebrate counts are all valuable, but without an organizing framework, they provide little useful information with which to make decisions. One standardized method of assessing stream health, known as the Proper Function Condition (PFC) assessment tool, uses seventeen criteria in the three categories of hydrology, vegetation and erosion/deposition to measure stream health. In its simplest form, the PFC tool is a qualitative field assessment conducted by an experienced interdisciplinary team that serves to identify critical factors that may put stream function at risk. Placed in their broader context, the PFC assessment criteria can be used as design criteria to restore and construct stream channels or as a management

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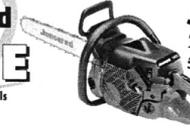
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tool to ensure that all the components of a functional riparian-wetland area are maintained.

According to the PFC criteria, a stream and its associated riparian-wetland area is considered to be in proper functioning condition when “adequate vegetation, landform, or large woody debris is present to:

- dissipate stream energy associated with high waterflow, thereby reducing erosion and improving water quality;
- filter sediment, capture bedload, and aid floodplain development;
- improve flood-water retention and ground-water recharge;
- develop root masses that stabilize streambanks against cutting action;
- develop diverse ponding and channel characteristics to provide the habitat and the water depth, duration, and temperature necessary for fish production, waterfowl breeding, and other uses;
- support greater biodiversity.”

Watershed management programs based on maintaining all seventeen

functional processes and attributes have been successfully applied in both wildland and urban streams in BC. The management program consists of five steps:

1. Identification of all watershed values; that is, what are we managing for? Timber? Fish? Drinking water? Aesthetics? Bird habitat? Once these values are identified, they are put aside until the stream/watershed can be assessed to determine if it is healthy enough to provide these values.
2. Diagnosis of stream/watershed health using the PFC assessment tool. Each section of the stream, and the entire system, is assessed according to the seventeen questions and placed in one of three categories: “proper functioning condition”, “functional-at-risk” or “non-functional”. If the stream is healthy (in PFC) then values can be considered. If processes or attributes are missing, then value extraction must be put on hold until those elements are restored.
3. Prescription. If the stream is healthy, or in proper functioning condition, the prescription is to protect it. Any of the



Texas Creek- Colorado September 1976. Non-functional. There was inadequate vegetation, landform or large wood to dissipate energy. With each storm event, the stream channel migrated, erosion accelerated, sediment was not filtered, flood-water retention and ground-water recharge were limited and water quality was altered. This caused brown trout populations to decline.

by focusing on stream

function

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key seventeen processes or attributes that are missing (thus placing the stream at risk) become the prescriptions for restoring the stream. If too many critical components are missing (stream is non-functional), then one must ask whether it is possible or cost-effective to restore the stream. If a management change, which will result in the recovery of the system, cannot be made then energy is best spent on at-risk systems that can be prevented from becoming non-functional. This system of "creek triage" allows managers to prioritize spending and use scarce funds more wisely.

4. Treatment. Treatments are based on which processes and attributes are missing. For example, if the PFC assessment determined that age-class distribution of riparian-wetland vegetation was not diverse enough, then the treatment would be a long-term planting program of diverse ages of the appropriate plants.

5. Auditing/Monitoring. The PFC assessment is reapplied to individual stream sections and to the whole watershed, as needed, in order to evaluate success. The information is then fed back to step two. Once particular processes and attributes, and thus the system, have recovered, then values can again be considered.

This program of stream triage combined with methods of keeping water on the land longer is known as Accelerated

Cooperative Riparian Restoration and Management. It has been developed in collaboration with the USDI Bureau of Land Management, USDA Forest Service and Natural Resources Conservation Service. The City of

Kimberley and City of Cranbrook actively use it, together with their timber licensees, to manage their community water supply watersheds and make decisions regarding timber extraction and recreation. It is also used by the

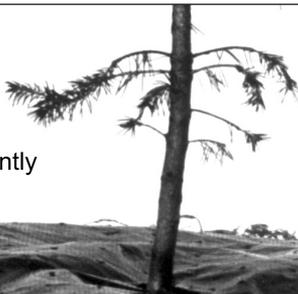


Texas Creek- Colorado. June 1978. Functional-at-risk. A change in grazing management allowed the riparian vegetation to recover. This reduced stream energy and allowed sediment to be filtered and captured, streambanks to develop, flood-water retention and groundwater recharge to improve, stream width to decrease, erosion to be reduced and water quality to improve. The system was still at risk because there was too much bare soil and desirable plant species were still lacking. The brown trout population doubled in the two years from 1976-1978.

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Texas Creek- Colorado. July 1987. Proper Functioning Condition. The riparian vegetation has recovered and the system can function properly.

District of Saanich to manage urban streams and as the basis for designing stormwater management facilities and it is being used by the District of Metchosin to rewrite their urban development bylaws to protect their aquatic resources. By focusing on stream function, rather than on values, we can promote healthy aquatic systems, no matter their size or location. Placing buffer zones around straightened channels or installing large wood in a system with too much bedload will do nothing to protect or enhance stream function. By promoting healthy, functional systems, we will derive the values we want and need: clean drinking water, water for healthy fish populations, riparian forage for ungulates and livestock, higher summer low flows, lower peak flows and less infrastructure damage. We will also spend our dollars more wisely by protecting healthy systems, repairing key components before they deteriorate beyond repair, and leaving Mother Nature to repair what we are unable to fix.

Cori Barraclough and Patrick Lucey are the principals of Aqua-Tex Scientific Consulting Ltd. Aqua-Tex specialises in freshwater ecology including management of drinking water supplies, urban stream restoration, stormwater management, education and policy.

WESTERN SILVICULTURAL CONTRACTORS' ASSOCIATION

by John Betts

The generally incomprehensible writings of the late Canadian media philosopher Marshall McLuhan contains at least one inscrutable aphorism applicable to this year's wildfire season in Western Canada: "Never forecast anything that hasn't already happened." To some extent that maxim summarizes the WSCA's apparent prescient prediction that we were due for a catastrophic wildfire season this year. To the observant, the events of this summer were simply the playing out of a trend that has been widely recognized across the U.S. and Australia for a decade.

After years of fire suppression, we can expect the combination of the fuel build-up and drought to produce wildfires of unnatural intensity. To put it more bluntly, as President Clinton might remind us, "It's the fuels, stupid."

Delivering that message has been the principle preoccupation on the WSCA forest policy front for the past two years, since we began to collaborate with forest fire ecologists Bob Gray and Bruce Blackwell. We continued that mantra most of the summer for obvious reasons. Gray and Blackwell are not by any stretch the only credible authorities on this topic and there are many other fellow travelers on this theme, both inside and outside of government. Nevertheless, by putting our heads above the parapets, at just the right moment, we seem to be the ones who have attracted attention.

In the early spring, we toured Forest Minister Mike de Jong through the Whistler/Pemberton corridor using it as an example of the interface fire threat many communities in BC face. (Ironically that neighbourhood didn't burn, but instead suffered flooding in the fall. Right place, wrong disaster.) That tour may have had some influence on the Minister's August announcement that prescribed burning would be renewed in BC to mitigate the wildfire threat. Later in the summer, we took West Vancouver-Garibaldi MLA and Minister of State Ted Nebbling on the same tour. We emphasized the need for a provincial wildfire strategy that includes mitigating the fire threat to communities and natural ecosystems through fuel management and eco-system restoration. A provincial initiative of this sort could generate a whole new forestry sector's worth of activities. Nebbling has asked the WSCA to prepare a presentation for the BC Liberal caucus later this fall. Little mention in the media was made this year of the considerable contribution private contractors made to the fire suppression effort in BC and Alberta. Regardless of the low profile, their work was significant. Now is the time to emphasize how important their role is to the protection program. Meetings are planned for this fall to prepare the contractor's case that they need to be more integrated into the agency program. This means resident contractors should

be deployed before outside agency resources are put to work. The WSCA is carrying this initiative to the government branches involved.

Besides the fire/forestry front, considerable progress has been made in the partnership between silvicultural contractors in BC and the Forest Industry Safety Association. Health and safety training in four areas is being specially developed for the silvicultural sector: bush driving, ATV operation, first aid for silviculture, and health and safety leadership.

The latter will have direct application to making the basic adaptation to BC's WCB results-based first aid regulations. The full FISA program will be ready for roll out in the New Year.

The 2004 WSCA annual conference, trade show and AGM will be in Victoria February 3,4,5 and will lean towards health and safety themes. Forest funding and the role of the private contractor in fire suppression will also be the subject of workshops and plenary sessions.

To keep momentum on the broad fire policy front, the WSCA is taking a lead role in holding a major international conference on wildfire and urban interface issues in May 2004 in Whistler. Speakers are just now being gathered to address, not only fire specialists and practitioners, but community groups, municipal governments, fire chiefs, forestry contractors and other wildfire stakeholders.

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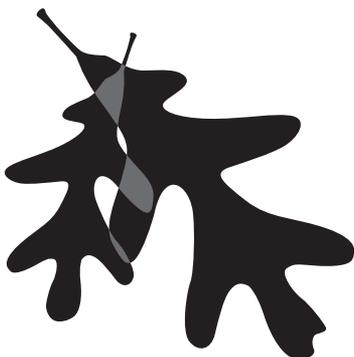
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QUEL EST L'AVENIR DE L'ÉCLAIRCIE PRÉCOMMERCIALE AU QUÉBEC ?

par Fabien Simard, ing. f., Directeur général



Depuis quelque temps, des études scientifiques ont remis en question les hypothèses sur lesquelles sont basées les activités d'éclaircie précommerciale au Québec. En effet, le Comité consultatif scientifique du Manuel d'aménagement forestier a émis l'hypothèse, après analyse de différentes études scientifiques, que le volume marchand, dans un peuplement à maturité qui a subi une éclaircie précommerciale, ne serait pas supérieur à celui d'un peuplement non éclairci. Cette conclusion remet donc en question la pertinence de poursuivre ces traitements alors que le but premier (augmentation considérable du volume total à maturité) ne semble pas atteint. Devant cette éventualité, l'AETSQ a pris l'initiative de rassembler certains spécialistes pour travailler conjointement à des projets de recherche, afin de valider le constat du Comité du Manuel d'aménagement.

Cette équipe multi-disciplinaire sera formée notamment de M. René Doucet, ing.f. et Ph.D, chercheur en sylviculture, M. Marc-André Lapointe, Ph.D, économiste, M. Réjean Gagnon, Ph.D, chercheur en biologie végétale, et finalement, M. Sylvain Parent, Ph.D, chercheur.

En partant donc de la prémisse que l'EPC n'augmenterait pas le volume marchand du peuplement, l'équipe désire démontrer qu'il faut aussi considérer les autres gains possibles. D'ailleurs, la majorité des pays industrialisés et même les autres provinces du Canada s'entendent sur cette affirmation, qu'il est quand même rentable au point de vue de la forêt et de l'économie de faire de l'éclaircie précommerciale. Elle est profitable pour la forêt parce qu'elle permet d'augmenter la croissance en diamètre des tiges et donc le volume moyen par tige du peuplement à maturité. Cet aspect permet, dans un contexte forestier, d'atténuer l'ampleur des chablis, de modifier la composition des peuplements, et parfois, de diminuer sa vulnérabilité aux insectes et aux maladies. De plus, sur le plan économique, l'augmentation du diamètre des arbres permet de diminuer les coûts

de récolte (abattage, débardage, ébranchage) et de transformation ainsi que d'augmenter la valeur des produits. Enfin, plusieurs forestiers d'expérience ont remarqué, sans toutefois le quantifier précisément, que la proportion du volume marchand effectivement récupérée lors des opérations de récolte est moindre pour les tiges de petit diamètre. Nous croyons que plusieurs de ces éléments pris ensembles pourraient justifier largement l'éclaircie précommerciale. Cependant, nous remarquons, qu'à ce jour, ces différents aspects n'ont été que partiellement étudiés, et ce, le plus souvent de façon isolée. Or, ils devraient tous être considérés simultanément pour établir la valeur des éclaircies précommerciales. Beaucoup de questions restent donc sans réponse. Cette année, l'AETSQ se consacrera à trois projets de recherche qui, nous l'espérons, procureront les données suffisantes pour permettre d'y voir clair. Ces projets sont : L'impact sur l'augmentation en croissance du diamètre, L'«enfeuillage» de la forêt boréale, c'est-à-dire l'envahissement des peuplements résineux par les feuillus, et L'impact socio-économique des travaux sylvicoles dans les régions ressources.

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WHAT IS THE FUTURE FOR PRE-COMMERCIAL THINNING IN QUEBEC?

by Fabien Simard, RPF, Executive Director



For some time scientific studies have been questioning the hypotheses on which pre-commercial thinning activities in Quebec have been based. In fact, the scientific advisory committee of the Manual of Forestry Management, after analyzing various scientific studies, has proposed the hypothesis that, in a mature stand that has undergone pre-commercial thinning, the marketable volume might not be any greater than that of a stand that has not been thinned. This conclusion therefore questions the usefulness of carrying out these activities if the primary aim (a substantial increase in the total volume at maturity) does not seem to be achieved.

In the light of this possibility, the AETSQ has undertaken to bring together certain specialists to work

jointly on research projects in order to validate the findings of the Manuel committee. This multidisciplinary team will include the silviculture researcher Mr René Doucet, RPF and Ph.D; an economist, Mr Marc-André Lapointe, Ph.D; a researcher in vegetal biology, Mr Réjean Gagnon, Ph.D; and a further researcher, Mr Sylvain Parent, Ph.D.

Starting from the premise that PCT might not increase the marketable volume of the stand, the team is attempting to show that other possible gains should be considered. Moreover, most industrialized countries and even the other Canadian provinces are agreed that it is nevertheless advantageous from the point of view of the forest and of the economy to practise pre-commercial thinning. It is profitable for the forest because it permits an increase in bole diameter and thus of average trunk volume of the stand at maturity. This feature, in the forestry setting, reduces the number of windfalls, allows the recomposition of stands, and may limit its vulnerability to insects and disease. Furthermore, on the economic level, increasing the diameter of trees can lead to a reduction in the cost of harvesting (cutting, loading, lopping)

and processing, as well as increasing the value of the timber. Finally, several experienced foresters have noted, without being able to quantify the phenomenon exactly, that the proportion of marketable volume actually recovered in harvesting operations is less in the case of small-diameter trees. We believe that several of these considerations taken together might amply justify pre-commercial thinning. We note, however, that until the present these various items have received only limited attention, and usually only in isolated contexts. They should now be examined simultaneously if we are to establish the value of pre-commercial thinning.

Thus many questions remain unanswered. This year the AETSQ will concern itself with three research projects that will, we hope, furnish sufficient information for us to see our way clearly. These projects are: The Impact of Diameter on Increased Growth, The Hardwood Invasion of the Boreal Forest, i.e., the pressure of deciduous trees on softwood stands, and The Socio-Economic Impact of Forestry Activities in Resource Regions.



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PRINCE EDWARD ISLAND

FOREST IMPROVEMENT ASSOCIATION

by Wanson Hemphill, Manager

Fall has arrived on PEI with the traditional winds, cooler weather, rain and softer ground. Hurricane Juan knocked down and snapped off a lot of trees on PEI, especially those with shallow roots and large foliage including poplars, larch, linden and spruces. Cleanup has been completed in urban and residential areas but cleanup and salvage in PEI forests has just begun. Dangerous situations are present where several trees are piled on top of each other and hung up on other trees.

Prices have improved for studwood and the firewood market for dry hardwood is the strongest since the oil shortages in the 1980's.

A Non-timber Forest Products Workshop is scheduled on October 17-18 at Mill River with many good speakers on maple syrup, wreath making, nutraceuticals,

mushrooms, trails, eco-tourism and chainsaw art.

A van-load of PEI forest owners recently visited Jim Dretcher of Windhorse Farms (www.windhorsefarm.org). This is truly a worthwhile visit to see the best forest in Nova Scotia and the many values placed on the large standing and harvested hemlock. A tour with Jim provides wonderful insight into the spiritual and ecological forest processes while providing an independent income for 7 families with the harvested and finished wood products.

PEI's new Forest Enhancement Program with 2/3 of the cost incentives on non-clearcut treatments has been slow to gain much uptake and many completed treatments. Reasons for the low response include: shortage of skilled silviculture workers; lack of established

training programs and training funding; management plan backlog; large number of forms and approvals to complete program steps; lack of promotion of program and other unknown reasons. However, it takes time to work out the gaps in any program and I believe we can make this program successful. I also believe it was important to get the program established with funding first, rather than work out all the unknown wrinkles and then start the program. With our recent election, we have a new Minister, Kevin MacAdam, who comes from an agriculture background. We plan to meet with the new Minister and staff shortly to coordinate efforts regarding silviculture programs as well as a list of other issues that we are working on. Work Safe and enjoy the forests.

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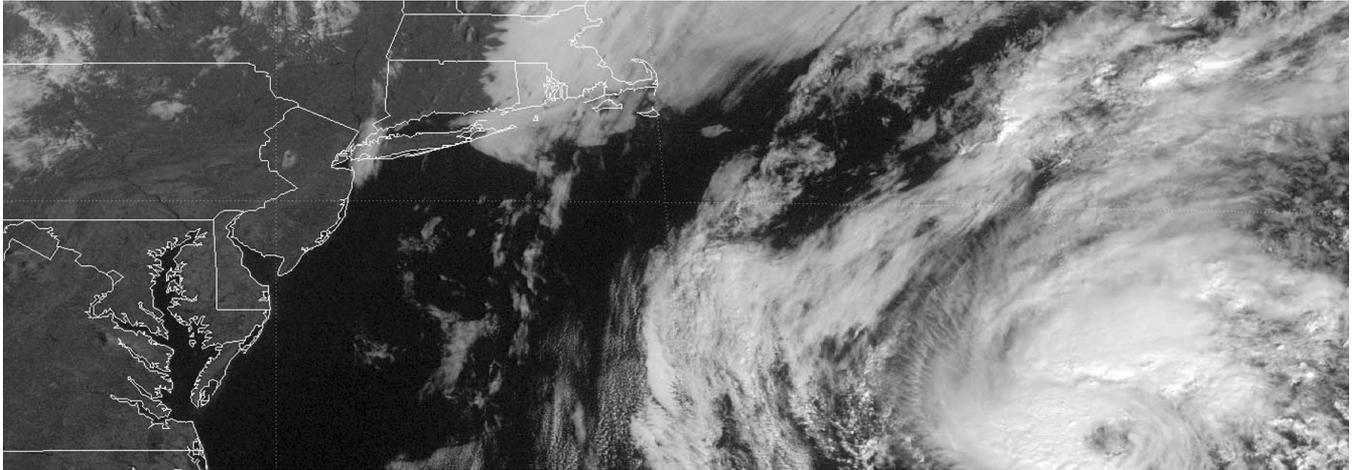
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NOVA SCOTIA

SILVICULTURE CONTRACTORS ASSOCIATION

by Allen O'Brien, President



Hurricane Juan hit the central region of Nova Scotia, on September 29, leaving many woodlots drastically altered, from small private woodlots to multinational Kimberly Clark. Wind speeds of up to 183km/hr were recorded during the storm. A friend in Stewiacke compared it to the scene in the Wizard of Oz when Dorothy was sent skyward. Both recently treated commercial thinning, as well as overmature Spruce and Fir stands were left wind thrown. Harvesting these areas will be no easy task. Mechanical processing heads are designed to fell standing timber or felled bunched stems. Although a feller buncher may be the most practical tool to be used in harvesting these areas, availability for use on small private woodlots may be an issue. With the

majority of silviculture contractors and logging contractors switching to mechanical operations in the past 5 to 10 years (largely due to unreliable workforce), there is little hope of salvaging all the downed timber. Areas left unharvested will make a nice fuel base in the years to come.

On a positive note, the provincial government has promised some financial aid to affected woodlot owners, with some specific stipulations applying. For more information regarding eligibility, woodlot owners can call, 1-800-670-4357.

Changes have been made to the sustainability legislation. The amount of compulsory silviculture work required to be completed by the Registered Buyers (mills) is to be

decreased by thirty percent for 2003. This decrease is based on the fibre portion of the sawlog that eventually becomes chips in the sawing process. The government (DNR) basis for the decrease was to grant a grace period for negotiating between pulp and saw mills. The irony in this decision is that some of the pulp mills currently have chip agreements related to silviculture credits. This leaves the silviculture contractor in a less than favourable negotiating position ... the reality of the situation is that there is no negotiating. Rates and mandatory technical standards are dictated (1980's pricing, 2000's technology). For the current situation to improve, there MUST be a demand for completed silviculture work. We'll keep you posted!

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by Gaston Damecour



The summer of 2003 saw increases in silviculture activity on both private and Crown tenures. The Province's Select Committee of the Legislature is expected to begin consultations in November or December on the Jaakko Pöyry report: New Brunswick Crown Forests: Assessment of Stewardship and Management. All groups or individuals interested in the future of our forests are invited to intervene and share their vision.

Private Lands

Private lands silviculture was spared the budget cuts experienced by other government programs. The 8 million dollar provincially funded program remained unchanged and was

supplemented by 1.6 million dollars from landowners and industry-woodlot organization funding initiatives.

Preliminary results indicate that pre-commercial thinning continues to dominate the silvicultural activity charts with approximately 80% of the area treated compared to 20% for reforestation. Planting was up approximately 20% with planting stock in tight supply.

The North Shore Forest Products Marketing Board acquired the Provincial tree nursery at Madran near Bathurst New Brunswick in 2001. The nursery had been closed since 1999 as part of the province's seedling production rationalization. According to Frank BRANCH, the Board's general manager, this is the second year of operation producing just over four million seedlings for the private woodlot sector and Crown lands. They are on track to produce six million seedlings using superior seed sources next year. BRANCH also indicated that with sufficient notice, they are in a position to begin producing custom orders. The facility has generated 30 part-time and full-time much needed jobs in the region.

There is a growing demand to undertake harvest-based silviculture, which is not

eligible for provincial funding. However, industry initiatives estimated at 1,2 million dollars are often used to fund silvicultural treatments that do not meet the provincial funding criteria; many are commercial or semi-commercial, or are non-traditional in nature.

Crown Lands

Crown lands saw their silviculture budget increase by 6 million dollars to 26 million. The increase is a one-time increase and a full uptake by the forest sector is expected. The main activities are pre-commercial thinning at 80% and planting at 20% of the area treated.

Multiple pass harvests (non-clearcut) now account for 25% of the volume harvested off Crown lands. This trend is expected to continue increasing over the next five years.

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

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Crisis is never easy, but preparing now while you are not staring down the barrel of a full blown incident will help you and your company survive.

Take the test below to assess your state of readiness to handle a crisis.

1. Do you have a written crisis response plan? All employees should have a copy and it should contain a checklist of assigned tasks.

2. Does your plan have contingencies for action if you are not available?

3. Do you have a trained crisis response team? One person should be assigned to handle media and other external communications. One is responsible for internal communications.

4. Have you and your assigned spokespersons been trained in how to do interviews with media, how and when to release information, how to keep track of the deluge of media, how to protect your employees and the families, etc.?

5. Do you have a complete and accurate list of all employees, including names of next of kin, addresses, phone numbers, etc.? (I have had clients who found that these lists are often out of date, incomplete and inaccurate—in a crisis that can be devastating.)

6. Is someone in the company in charge of verifying and updating that list at least quarterly?

7. Do you know how to develop key messages about the incident to use in communication to employees, the public,

and the media? Good communication can help preserve the health of your company in spite of crisis.

8. Do you have a one-page backgrounder on the company for media and other interested publics? Date started, president's name, number of employees, where located, how many offices, nature of the business, association memberships, awards, safety record, responsible actions training, policy, etc.

9. Do you have a plan for communicating crisis information to employees who are at dispersed sites?

10. Do you have the number of a crisis communication expert? This person can advise you over the telephone of what to do and what to say to media and employees or assist you on site.

If you can answer yes to all of these questions, you will have a better chance of successfully leading your company through a crisis.

Leslie Habetler is president of Dynamic Communication Strategies, a crisis management consulting firm, 541-338-4333, leslie@dcsconsulting.biz, www.dcsconsulting.biz



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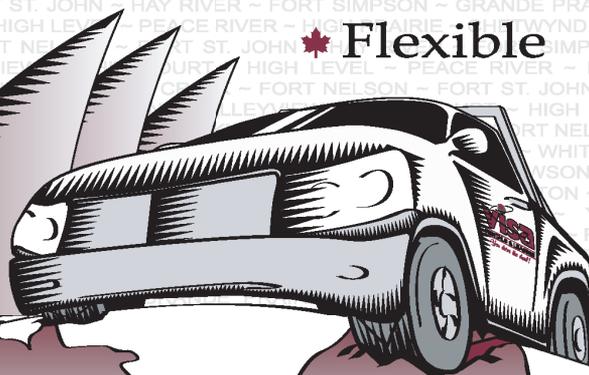
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Canada

hosts the World Forestry Congress

What an incredible congress! The quality and value of the experience of the 3200 guests from 140 countries made all 800 Canadians who attended proud. Initially it was overwhelming and disorienting to navigate the multitude of congress event options. The plenary was made up of more than 70 main events. There were also over 200 side events, 150 booths (some of which were staging additional events) and 25 field trips.

Of course, the congress was also an opportunity to reconnect with colleagues and plan individual and group meetings. All of this was scheduled to take place over the course of 7 days. It soon, however, became clear that it was impossible to be in the wrong place at the wrong time. Even relocated events and lost attendees could have valuable, if unplanned, meetings. The abundance of amazing people with uniquely different backgrounds made every meeting a thoughtful and valuable encounter. The WFC 'Forests for life' was jointly organized by Canada's Natural Resources Ministry, Quebec's Ministry of Natural Resources and the UN Food and Agriculture Organization (FAO). With FAOs' involvement, the themes of the World Forestry Congress were firmly woven into the international processing of global issues that takes place at World Congresses and Summits.

For some, the international pace of gradually evolving understanding and change is slow. But there are vast differences in experience and background from different regions and they have to be accommodated. This was well illustrated when one attendee asked two speakers how they dealt with the asymmetry of power between men and women in implementing successful community forests. Ms. Gopa Pandey from India answered, "Knowledge can be imparted overnight, skills take time, but attitudes takes a very long time, sometimes a generation." Ms. Marilyn Headley from Jamaica replied, "We women in Jamaica are kind of strong minded. We do not have any trouble making ourselves heard. I don't think any man would care to ignore us."

The Canadian International Development Agency funded the attendance of over 700 people from the poorer countries. The WFC embraced the eradication of poverty as a key priority for its working sessions. The Congress Center in Quebec City is set alongside the Citadel, the old city of Quebec, the Plains of Abraham, Hotel Frontenac and the Quebec legislature. Rich in history as one of Canada's first European settlements, it made a telling setting for the Indigenous people's conference at the congress. Dressing in brilliant indigenous colours, singing, drumming and dancing, the Indigenous Peoples carried their

Wendake Action Plan to the Forestry Congress - a joyous message through concrete streets steeped in the history of Canada's aboriginal people. The Wendake Action Plan captures its essence in the core statement: "That the United Nations and its bodies and specialized agencies, Nation States, international and regional inter-governmental organizations and international multi-lateral agencies recognize and guarantee Indigenous Peoples' right to self-determination, including the right to govern the use of natural resources and maintain the integrity of our cultures and ecosystems in accordance with our respective world views."

The voice of indigenous peoples, and the assertion of their place in the forest, was strong and clear throughout the congress. Indigenous people represent the oldest forest communities and residents. The emerging congress vision, in the face of the decline of rural resource communities, of finding a sustainable balance for the livelihood of residents and communities within natural forest ecosystems was generally receptive to the indigenous people's statements. Indigenous communities, unlike many resource boom towns, are growing and form an opportunity for realizing the congress vision. But the indigenous peoples concluded, "Nation states must stop taking the resources from

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our lands and must stop using our issues to promote their national goals in the international arena without ensuring that they have fulfilled their commitments at home.” This includes “developing a framework to promote and protect traditional knowledge”.

The structure of the main congress sessions facilitated an expression of the broad convergence of concepts that is emerging, despite the differences in cultural and eco-regional backgrounds across the world.

The first 2 ½ days of sessions were focused on presentations and discussion on ‘Forests for people’ and the ‘Forests for the planet’. This set the stage for resolving the conflict between the ecosystem and the social, economic and cultural values of people in a day of roundtables organized into five global forest eco-regions—boreal, temperate, dry sub-tropical (including Mediterranean), dry tropical, sub-tropical and tropical humid.

I choose the boreal session, which represents 43% of the world’s forest area. Facilitators ensured that there were a mix representing different regions and sectors seated at each table. Each group was challenged to give a broad portrait of their eco-region in 2021 (the projected date of the XV WFC) referring to people and communities, the state of the forest and structures and capabilities. Then they had to detail the interim actions that would take place by 2009 (the

projected date of the XIII WFC) to result in that outcome and finally, who needed to take those actions.

The animated discussion at our table resulted in moments of clarity, though often from different perspectives, but about the same key issues. It was clear that there was a common interest in achieving sustainability through putting forest communities and residents back at the center to achieve “people and forests in harmony” - the theme of the next day’s session.

The collation of statements from the 1,000 other participants was completed for presentation to the morning plenary session the next day and supplemented by comments from the floor. The statements from our table were well reflected in the final statement: “Forests have enormous potential to make an invaluable contribution to the imperatives of this era: for environmental security, poverty alleviation, social justice, enhancement of human well being, equity for present and future generations. However, harmonization between people and the planet cannot be achieved by forest managers alone. Bridges must be built with other sectors.

With 1.6 billion people worldwide relying on forests for their livelihoods and 12.4 million hectares of tropical forest being destroyed annually, a United Nations-backed international congress has called for a worldwide political commitment to reducing

deforestation significantly over the next decades.”

The call for setting a goal of 50% for reducing deforestation was not embraced. The congress listened to the resistance to the ‘forestry colonialism of the developed countries’ from the representatives of the developing world. Most of the natural forests worldwide are owned by the states, and not privately, and in many areas the land is still being deforested for extending agriculture settlement.

It was recognized that all of the world’s forest product demand could be met from 5% of the forest land base with intensive plantation forestry. This could take the pressure off the demand for products from the natural forests. The congress vision is for sustainable forest management in natural forests, as well as conservation that ensures the preservation of the world’s forest ecosystems.

In retrospect, beside the friendships renewed and acquaintances made, the greatest satisfaction was finding some clarity of vision through the experience of meeting with, talking to and hearing other people from around the world. Each of our minds extend beyond our brain, seemingly across time and space but require human contact to develop the kind of consilience of ideas across disciplines that creates a coherent picture of how to find a balance between people and forests.



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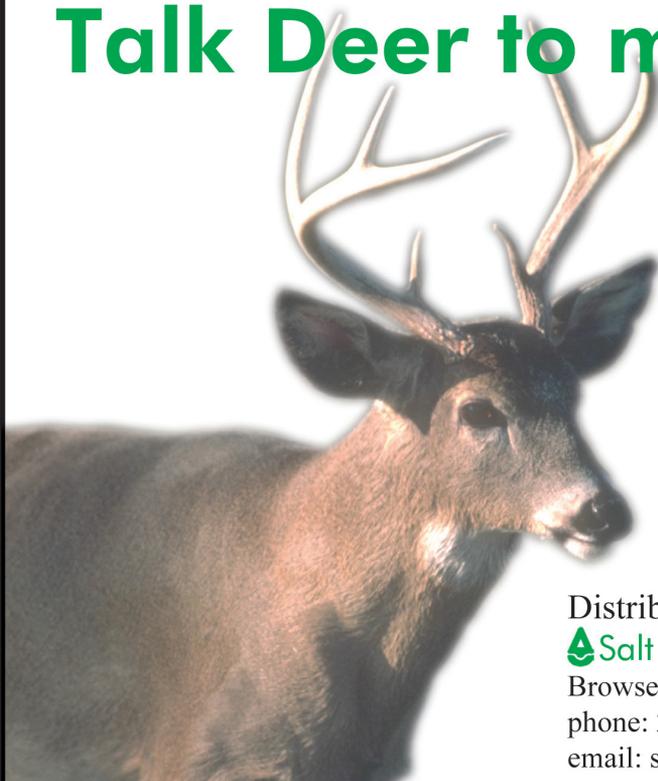
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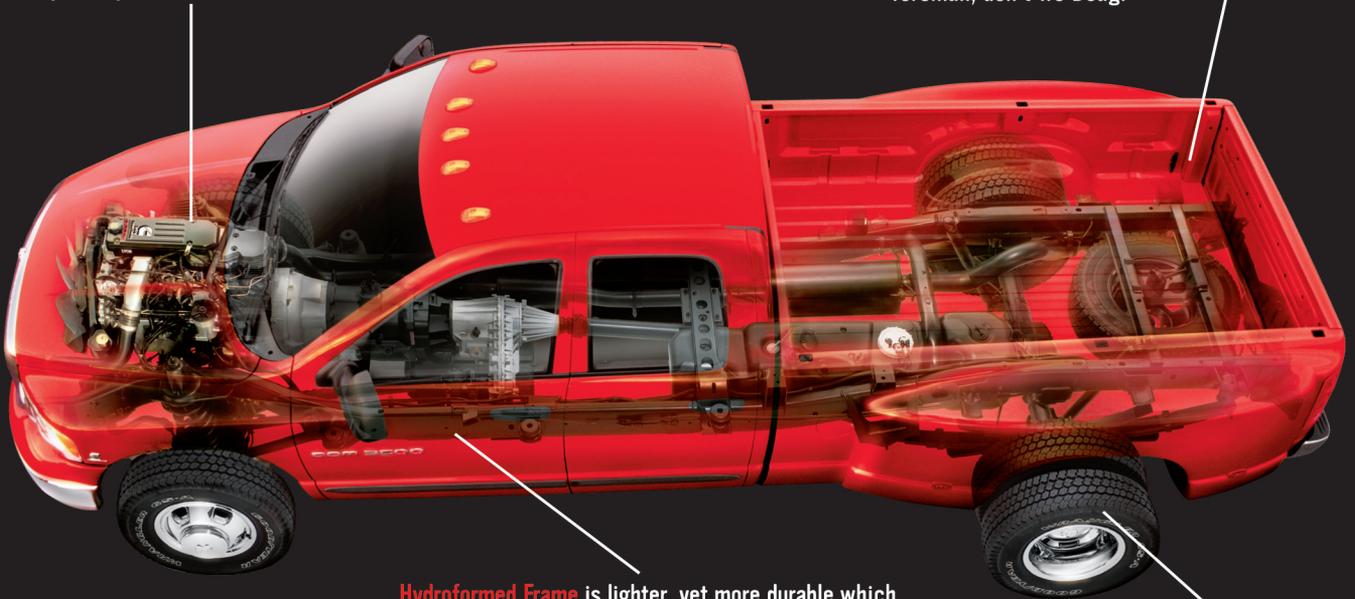
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