

JANUARY - FEBRUARY 2009

BC

Forest

PROFESSIONAL

Special Feature

2008 Registration Exams

Putting BC's Wood Products
on the Front Line in the Fight
Against Climate Change

Fertilization and Carbon Sequestration in BC's Forests

Thematic Maps Help Manage
MPB Impacted Stands

Battle of the Networks of Forest Professionals

Celebrating National Forest
Week with Kids and Crayons



FEATURE
Forestry Transportation

What's Your Problem?

Our mills are losing MONEY.
How can we generate more **REVENUE**?

— Stora Enso predicts 2.5% savings, JD Irving potential savings of 6% – 7%.

How much CARBON do we have available for trading?

— New Forests Pty, Ltd. is optimizing forestland investment opportunities by identifying carbon sequestration capacity in order to sell offset credits.

Our forest management plans are not TRANSPARENT or defensible.... We have no idea if the answers are right or what effect they will have on the future of our forest.

— Provinces and states across North America creating transparent defensible management plans and understanding the future impact of all decisions made today.

How do we PROTECT habitat and still meet financial objectives?

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— Decision makers evaluate strategies, allocate resources based on forest management objectives and fire behavior together in a transparent defensible manner.

What is the REAL value of our forestland?

— Resource Programming Inc. valuation model winning hands-down in a California bankruptcy court because they used superior technology to show the real value of the disputed forestland.

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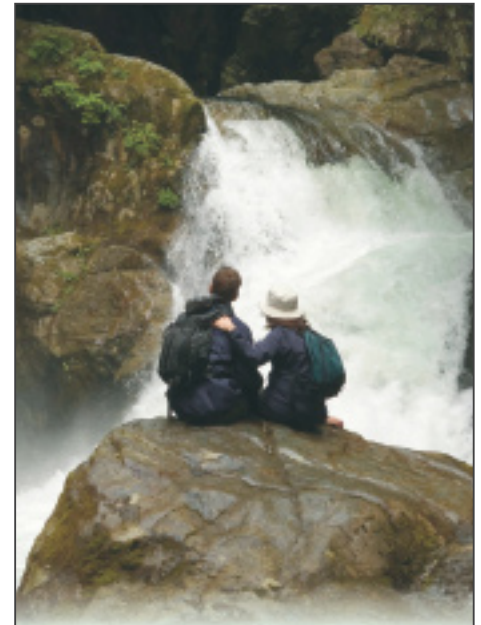
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than a waterfall.

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Choosing Livelihood Over Ethics

In Annie L. Booth's article "Forest Professionals and Failures in Ethics" published in the November/December issue of **BC Forest Professional** she mentions that a "forest professional is expected to uphold professional principles above the demands of employment," and says if professionals did so, they would surely "risk a job, a profession, or professional acceptance." I am glad to see someone else agrees the Code of Ethics is severely limited by the power an employer holds over the professional. The ABCFP has recognized this dilemma for some time. One of the Standards of Professional Practise is to practise independently of the employer or client (Standards of Professional Practise: Guidelines for interpretation, Bylaw 12.3.1 Independence Standard).

However, the Guidelines for Interpretation Code of Ethics interprets: "To uphold the professional principles above the demands of employment" to mean "members must distinguish between professional forestry decisions and the exercise of management prerogative which may result in a deferral or a modification of a members prescribed actions" (Guideline 3 11.3.2). This means that a member can make a professional forestry decision but this decision can be delayed, ignored or changed by management since they have the exclusive right or privilege to do so. The Guidelines also mentions that in the case of a "conflict between the requirements of employment and the member's professional principles, the member must inform the appropriate person about this conflict...and may seek advice and support for their position from the Association." There is some question around who this appropriate person is and what sort of advice and support the ABCFP can offer.

In reference to Ms. Booth's viewpoint, I believe a professional will feel pressure to choose their livelihood over upholding professional principles, especially in the current economic climate. Unless the ABCFP can find ways to allow members to practise in a truly independent manner, and support members upholding professional principles above the demands of employment, unethical behaviour will be the norm rather than the exception.

ALBERT VANDENBERG, RPF
BURNS LAKE

Moral Relativism

The moral relativism in the November/December ethics themed issue leaves us lost in the woods without a compass. Ethics is about goodness, righteousness and truth. That is where our compass should be pointing.

It is nice to think that we are making progress in BC and evolving toward Gifford Pinchot's ethic of the "greatest good for the greatest number." But are we really?

Pinchot advocated that timber interests should be kept out of forest management. Instead, to put the ethic of stewardship above that of ownership, the government should own the forest and act as an enduring steward by supplying independent professional forest management. He had the ideas behind the establishment of the US National Public Forests. Western timber men wanted to shoot him.

Pinchot also had the ideas behind another visionary experiment in forest sustainability. The innovative recommendations of BC's Fulton Commission matched those of Pinchot's. Read the fine print and you will see that the Commission consulted with Pinchot.

How do we really stack up against Pinchot?

- The BC Government as enduring trustee of our public forests has become a partner with timber interests.
- The government acts as a timber interest for the good of its partners and is in conflict with its role to see to the public good.
- The Forest Service, the independent professional forest management agency has delegated considerable forest management responsibility to timber interests.
- Forest managers are employed by timber interests and are not independent.
- We have major red flags on forest sustainability on the coast and the Interior.

It is about time we started to deal with the truth, rather than the truth as we want to know it. Our system of forest stewardship is a corrupted failure.

We need change; for goodness sake!

ANDREW MITCHELL, RPF (RET)
NORTH SAANICH

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Failure In Ethics Indeed

In response to the article published in the November/December issue of **BC Forest Professional**, "Forest Professionals and Failures in Ethics," I believe the teacher of ethics needs a refresher in ethics. A message I heard throughout my academic career was, "Refrain from making a decision without attaining the information required to responsibly and professionally make that decision." As most ABCFP members would recognize, the duty to collect all necessary information prior to making a decision is intimately tied to the practice of due diligence; a topic being covered very well by the ABCFP and one most professionals are well aware of.

The story involving the First Nation elder's and the RPF who blew off the elders concerns regarding his traditional hunting grounds, in my professional opinion, is an example of failing to practise due diligence. The forester's response to "go hunt somewhere else" is a complete failure in productive communication and proper ethical conduct. Such a failure makes me question the validity of the story. If the forester's response was conducted in the manner written in the story, my advice to the elder or any member of the public is to report this type of behaviour to the person's employer or the ABCFP itself to have the person dealt with appropriately.

To the article's author, to publish the details of these events without including a response by the forester is a failure in ethics indeed. My advice to all practising and aspiring forest professionals is to be dually diligent in attaining all the necessary information prior to forming an opinion or making resource management decisions. If one practises with protecting the public interest in mind then the debate of ethical behavior should not be an issue.

JEREMY SROCHENSKI, RPF
FORT NELSON

BC Timber Sales Achieves SAFE Company Certification

Along with a number of other people, I had the privilege of providing a feature story for the September/October 2007 edition of the **BC Forest Professional** magazine, which focused on forest safety. I would like to provide you with an update on the significant progress we have made in the past year with our safety program and improving forest worker safety.

In August 2008, BC Timber Sales (BCTS) marked a major safety milestone when the

Making Our Democracy Sounder

It has been said that democracy is the worst form of government except all the others that have been tried. – Winston Churchill

In the article by Dr. Annie L. Booth on failures in ethics in the November/December issue of the **BC Forest Professional**, it is not the specific conduct of the forester that is crucial to the point at hand but the lack of authority of the First Nation. While the forester may have behaved unprofessionally, the decision to harvest this area is a decision made implicitly by the provincial government.

Throughout BC, First Nations are not currently the decision makers where they claim rights. Although the courts require the government to consult and accommodate, the final decision belongs to the government; if there are two mutually exclusive options for land use the non-First Nation use will usually take precedent.

Dr. Booth states that our governments do not fully represent our values; yet, what choice do we have?

Our government is the representative of our society and therefore the values represented by the government are the values that are adhered to, warts and all. If these contradict the values of people who do not accept the authority of the government they can oppose these (legally or otherwise) or acquiesce. For the opposing side to acquiesce – i.e., to institute a land-use not consistent with the ruling party's position – would be tantamount to an ethical violation because it would violate the values set by that society.

Dr. Booth asks a very important question: "What happens if an entire system is unsound?"

organization achieved certification under the SAFE Company program of the BC Forest Safety Council. We feel this is a remarkable achievement for our organization and a significant step in our ongoing commitment to improve forest worker safety. Our success as an organization in achieving SAFE Company certification is due to the efforts of people across BCTS, many of whom are professional foresters and ABCFP members.

Then there are no winners. The solution, perhaps, isn't to chastise the foresters but to resolve the land claims (and eliminate a two-tiered system of citizenship) – this would make our democracy sounder.

COLIN BUSS, RPF
CAMPBELL RIVER

Editor's Note

The First Nations elder mentioned in Annie Booth's article, "Forest Professionals and Failures in Ethics," in the November/December issue asked to be named in the article. Unfortunately, the magazine had already gone to print at the time of the request.

Max Desjarlais, a West Moberly First Nations elder, was the person who tried to explain his hunting traditions to a forest company's RPF and was told to go hunt somewhere else.

Article Excerpt:

"One elder met with a forestry company's RPF to discuss harvest plans in the elder's hunting areas. The elder took time to explain how important hunting was for himself and for his great-grandchildren. He explained how his grandparents had hunted in the same area and how difficult it was now to find moose given the developments on the land (oil and gas exploration and wells, coal and copper mines, coalbed methane, wind farms, pipelines and forestry). Finally, he explained how concerned he was about a proposed cutblock in an area still relatively untouched. The RPF told him to go hunt somewhere else. The elder threw the RPF out of the band office."

BCTS is working to enhance forest worker safety by requiring firms bidding on BCTS fieldwork contracts such as road building and reforestation, and those directing or employing workers on timber sale licences issued by BCTS, to be SAFE Company certified after December 31, 2008.

DAVE PETERSON,
ASSISTANT DEPUTY MINISTER
VICTORIA



Significant Changes Require Significant Leadership

You don't need to be told that the forest sector in BC is going through profound changes right now. Because our neighbours to the south are our biggest market, the decline in the US economy and housing starts is affecting the price of lumber here.

Issues like climate change and the mountain pine beetle are leaving their marks on the forest and leaving us wondering how to deal with the fallout. There are still other challenges we face as forest professionals such as changing tenure, the role of First Nations, professional reliance beyond FRPA and even recruitment issues.

The ABCFP has been tackling these issues and more. The goal of the association is to ensure that forest professionals are leaders in responding to these challenges. Forest professionals are the ones who are on the front lines so we see the changes first and feel the effects of these changes before anyone else. As a result it is critical that the ABCFP continues to be in a leadership role in the work as it unfolds.

In 2008, the ABCFP took a leadership position on several occasions. We submitted a report to the Minister's Forestry Round Table and made a presentation in person. The ABCFP submitted five focus areas we feel are essential to sustainable forest development and good forest stewardship. **The Planning Gap** is a structural problem in determining land use with multiple users. Tenure is currently the primary vehicle for commercial access to forest values that the forest offers and therefore, **Tenure Reform** is an opportunity for aligning tenures with social goals. **Diversification** is an essential change in focus to encourage the promotion of non-timber commodities, investments and culture in the forest sector. **Community Foundation**

describes the multi-dimensional application that is required for a sustainable community and forest. **Expertise Succession** is the need to intensify our efforts to bring new people and ideas to the management of the forests.

Another major leadership project the ABCFP took on during 2007 and 2008 was the utopia planning paper. We examined how planning is currently being done, where the gaps are and surveyed members to come up with recommendations to improve planning in BC. The result of two years of work was a letter to the Minister of Agriculture and Lands recommending that BC adopt land-based management planning that would take all potential uses of the land into account.

The Professional Reliance Task Force released a final report offering members guidance for applying professional reliance under the *Forest and Range Practices Act* (FRPA) and continues to develop a strategy to further professional reliance to other areas of business and to include other resource professions. We continue to hear how important further evolution of professional reliance is to our current forest minister as well as to MFR and industry leaders. The onus is on us as the ABCFP to continue to be leaders in this area.

Now is the time to sustain and build on this work to ensure that forest professionals' experience and expertise is part of bringing about change that is consistent with good forest stewardship. 🌲



CEO's Report

by Sharon Glover, MBA

Where do Your Fees go?

All of the staff at the ABCFP pride themselves on working hard for members. We like to think that we always put members first and often work late or on weekends to make sure members get the service they deserve.

We are well aware of the lean economic times most of our members are facing right now. We've heard about hiring freezes, a lack of pay raises, salary rollbacks and loss of employment. We know you, our members, are working harder for less pay, so we want you to know how your fees are being spent at the ABCFP.

The ABCFP breaks our work down into six major areas in addition to an area we are calling Governance because it involves the general running of the association. The 13% of fees that go to Governance include things like travel for council members and senior staff to attend meetings and meet with members as well as running the council election and other major balloting.

The two largest uses of member fees are Member Relations and Advocacy/Stewardship at 23% each. Included in the Member Relations area are most of the ways staff communicate to members such as **BC Forest Professional** magazine, the website, **The Increment** e-newsletter and major member mailings. We use these tools to not only keep you informed about what the ABCFP is doing, but also to provide some continuing education in terms of the magazine articles and to let members know about special opportunities such as workshops. Obviously the website as well as the other communication vehicles have significant external audiences such as elected officials and members of the public.

The Advocacy/Stewardship area includes all of the work the ABCFP does to promote good forest stewardship and forest professionals. This includes researching and writing guidance and advocacy papers, meeting with the minister as well as other forest stakeholders and participating in joint committees to ensure that the public's interests in the forests are maintained.

It takes a lot of effort to register and regulate almost 5,400 members and that's where 18% of your fees are spent. Registration staff evaluate applications, vet international qualifications, organize the registration exams, match sponsors with enrolled members and answer a slew of questions that come up on an ongoing basis during the registration and enrollment process.

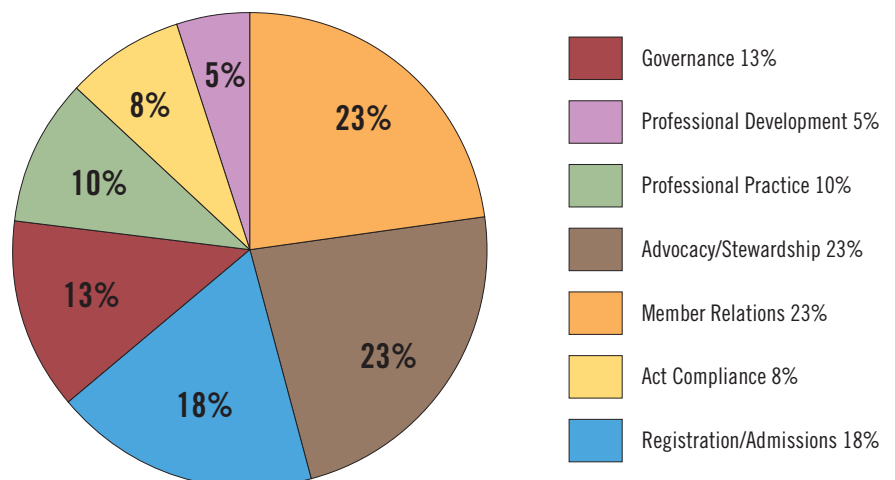
A further 8% of your fees are spent on *Foresters Act* enforcement issues. For example, in 2008 we wrote to every municipality in BC advising them of the need to abide by the Act and helping them understand when they had to hire forest professionals. The ABCFP also meets with individual employers and explains that they must also hire forest

professionals to perform forestry work.

The 10% of your fees that is spent on Professional Practice issues can be seen in the guidance papers and reports produced by committees such as the professional practice committee and its subcommittee which focuses on issues in appraisals and cruising. This work identifies issues and provides valuable guidance to members.

Professional Development includes all the costs of developing and delivering workshops as well as the visits senior staff make to coach registration exam study groups. The ABCFP offered two new workshops this year – the exam writing workshop and the two-day session on ethics and obligations. The policy review seminar and the fall workshop on professional reliance are updated each year. Because the workshops are so well attended, we hope to offer more in the coming years. We are also planning to deliver some of our courses electronically which will make them cheaper for you to take.

I hope you find this article informative. I welcome comments and questions on the Discussion Forum. 🐟



It's Time to Renew

The deadline to renew your ABCFP membership was December 1, 2008, but you can still renew without being charged any additional administrative fees if you do so by January 31, 2009. After this date, an additional \$30 will be charged on all late renewals. Members who do not renew their membership by March 31, 2009 will no longer be entitled to practise forestry in BC.

Remember, fee payment is only one of the steps required to renew your membership and depending on your membership type you may have an additional one or two steps to complete before your membership is renewed. Visit the Steps to Renew page of the website for complete details by clicking on the Members' Area menu, then My Membership and Steps to Renew.

ExpoFor 2009 is Fast Approaching

ExpoFor 2009 will take place in Prince George from February 25 to 27, 2009. Jim Snetsinger, RPF, will speak at one of the breakfasts at ExpoFor 2009 and he is just one of many excellent speakers! Another highlight is the two optional pre-conference workshops. If you missed the professional ethics and obligations workshop or the fall workshop on professional reliance, take advantage of their repeat performances at ExpoFor 2009.

Don't miss this more compact conference in beautiful Prince George! Online registration is now available. Please note that if you are GST exempt, you are not able to register online, instead please use the registration form that was included in the November/December issue of **BC Forest Professional** magazine. This form is also available on the Registration page of the ExpoFor website. The ExpoFor website (www.expofor.ca) is being continually updated with information about the program, sponsors and exhibitors.

Experience ExpoFor 2009

The ABCFP's Annual Forestry Conference and AGM
Prince George, February 26th - 27th, 2009

(with pre-conference workshops and Icebreaker on February 25th)

Delegates – Check out the schedule of events on the ExpoFor website. You'll see a number of great speakers and informative workshops you don't want to miss. Remember, you can still take advantage of the early bird discount and save up to \$125 off your registration fee.

Exhibitors – Thinking about exhibiting in the trade show at ExpoFor 2009? Sign up now to take advantage of early bird discounts and save \$250. Book now and get access to over 400 delegates. Your exhibitor package includes one full conference registration package.

Sponsors – If you would like to support ExpoFor 2009 and have your brand advertised during the event, please visit the Becoming a Sponsor page on the ExpoFor website.



For more information, visit www.expofor.ca



ABCFP Move Translates Into Considerable Savings

The ABCFP's lease on its Georgia Street office expired and the landlord wanted to raise the rent significantly making it impossible for us to remain in the same location. In addition, as three staff members do not work from the Vancouver office, we had too much space so the ABCFP opted to move to an older building in Gastown. The office is still conveniently

located close to public transit and the sea plane/Helijet terminals for committee members who travel to Vancouver for meetings. The new digs are significantly smaller (about 700 square feet less than Georgia Street) and that translates into a considerable savings on rent and utilities.

If you are coming to Vancouver, the ABCFP staff invite you to drop by to see the new office any time. Our new address is:
330 - 321 Water Street
Vancouver, BC V6B 1B8
All e-mail, fax and phone contact information remain the same.

Forest Capital of BC 2009

The ABCFP is proud to announce that it has awarded Fort St. John with ABCFP's Forest Capital of BC 2009 title.

As the most important centre for enterprise in the northeast region of British Columbia, Fort St. John caters to the forestry sector. The forestry industry alone directly employs more than 700 people in this town of 18,000 and contributes over \$98 million per year to the local economy.

"This honour recognizes and celebrates the valuable role our forests play in the economic and environmental health of our community and we are thrilled to be named the 2009 Forest Capital of BC," stated new Mayor of Fort St. John Bruce Lantz.

Surrounded by a 4.5 million hectare forest, Fort St. John has embraced its responsibility as a guardian of the forest sector by developing the Fish Creek Community Forest and reforestation initiatives that have resulted in more than 50 million trees planted in the last 20 years.

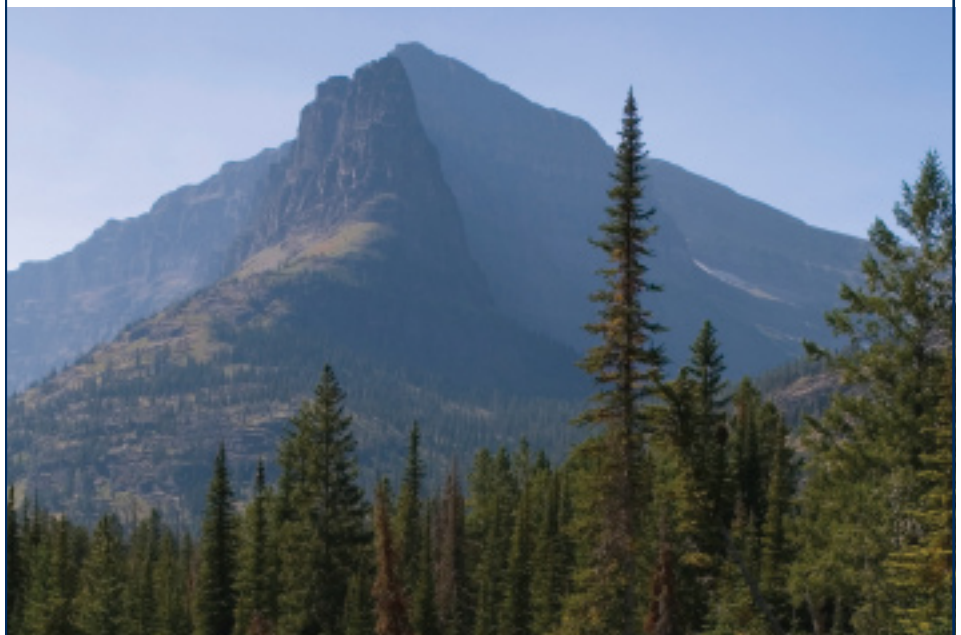
Fort St. John has planned a variety of seasonal events to celebrate their Forest Capital status. This program includes a spring tree seedling distribution, opening ceremonies, and a summer forestry themed Family Fun in the Sun week.

"The Forest Capital of BC program is a great way for British Columbians to celebrate the economic, cultural, natural and historic contributions of our forests to community life. Our forests fuel the provincial economy, provide us with spectacular recreation areas and support the incredible natural diversity all around us," said Al Balogh, RPF, ABCFP President.

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Professional Reports No Longer Required

The Board of Examiners has approved a change in requirements for RPF candidates who have previously been required to complete a professional report. The requirement for the professional report is being replaced by a requirement to complete the take-home examination. ABCFP enrolled members who are currently in the process of completing the professional report will have the option of finishing what they have started or doing the take-home examination instead. Going forward, all enrolled members who would have had to complete a professional report will be required to complete the take-home examination. The take-home examination is a test of an RPF candidate's skills and abilities in the areas of written communications skills, research and investigation, abilities to develop a cogent argument and abilities to provide relevant observations and conclusions from their research. RPF candidates who have met the professional report requirement retain the option of doing the take-home examination or only doing the sit-down examination.



Put in Your Two Cents

The **BC Forest Professional** letters' section is intended primarily for feedback on recent articles and for brief statements about current association, professional or forestry issues. The editor reserves the right to edit and condense letters and encourages readers to keep letters to 300 words. Anonymous letters are not accepted. Send letters to:

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Fax: 604.687.3264
E-mail: editor@abcfp.ca**

Please refer to our website for guidelines to help make sure your submission gets published in **BC Forest Professional**.

Official Notice of the AGM

The ABCFP's 61st Annual General Meeting will take place at ExpoFor 2009 in Prince George, BC. The AGM will be held on Thursday, February 26, 2009, from 2:15 to 3:00 pm at the Prince George Civic Centre. The AGM, council hot seat and resolution sessions are free for all members and registration at ExpoFor 2009 is not necessary to attend these events. The preliminary agenda for the AGM is as follows:

1. Adoption of the minutes from the previous annual meeting.
2. Member recognition.
3. Adoption of annual report.
4. Adoption of the audited financial statements.
5. Appointment of auditors.
6. Appointment of one or more returning officers and scrutineers.
7. Reporting of council election results.
8. Ratification of council and staff actions.
9. Business resolutions (if any).
10. Adjournment.

Any matters requiring a vote are restricted to eligible voting members in good standing.

Geographical Information Systems (GIS) Certificate

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Feb 19 - Jun 19, 2009

Other programs available include:

- ArcInfo for Forestry Level I and II
- ArcPad GIS/GPS for Handheld PDA's

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industry

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Toll free 1-866-352-0103
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www.okanagan.bc.ca/gis



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The Hard Facts Behind Hauling Logs

EVER SINCE WE'VE BEEN HARVESTING TREES IN BC, we've needed to move them from where they were cut to where they were processed. At the very beginning, that meant harvesting trees near the water so they could fall in water and float to the mill or using oxen and horses to bring the logs out of the forest. Forestry transportation began to evolve as engines and motors took over from hoof and harness.

Roads have come a long way from the first skids roads of the 1800s. In our first article, Dennis Bendickson, RPF, takes us through this transportation evolution in his article,

"Forest Transportation in BC: From Oxen to Hydraulic Excavator." Then Mark Boyce, PhD, *et al.* goes on to explain how forestry roads are affecting grizzly bear populations today and Phil Zacharatos, RPF, discusses the *Resource Road Act* – Bill 30 and how it will affect the builders and users of resource roads in BC.

Another aspect of resource roads is crossings – bridges, culverts, etc. – which make the roads passable. Allan Bradley, RPF, PEng, takes a look at geotextile reinforced soil structures and how they are changing the engineering behind forestry transportation in

his article, "GRS: Putting Dirt to Work." Road structures and their management also seem to be undergoing their own evolution at the moment. Doug Johnston, BSc, EIT, and Julien Henley, MAsc, PEng, discuss the pros and cons of using asset management systems (AMS) to track the wear and tear, maintenance and costs of forestry transportation structures in their article, "Asset Management Systems Become Affordable with Third-Party Hosting."

Forestry transportation is a technical and diverse topic. We hope that everyone can find something of interest to them in this issue. 🐾

Forestry Transportation in BC: From Oxen to Hydraulic Excavators

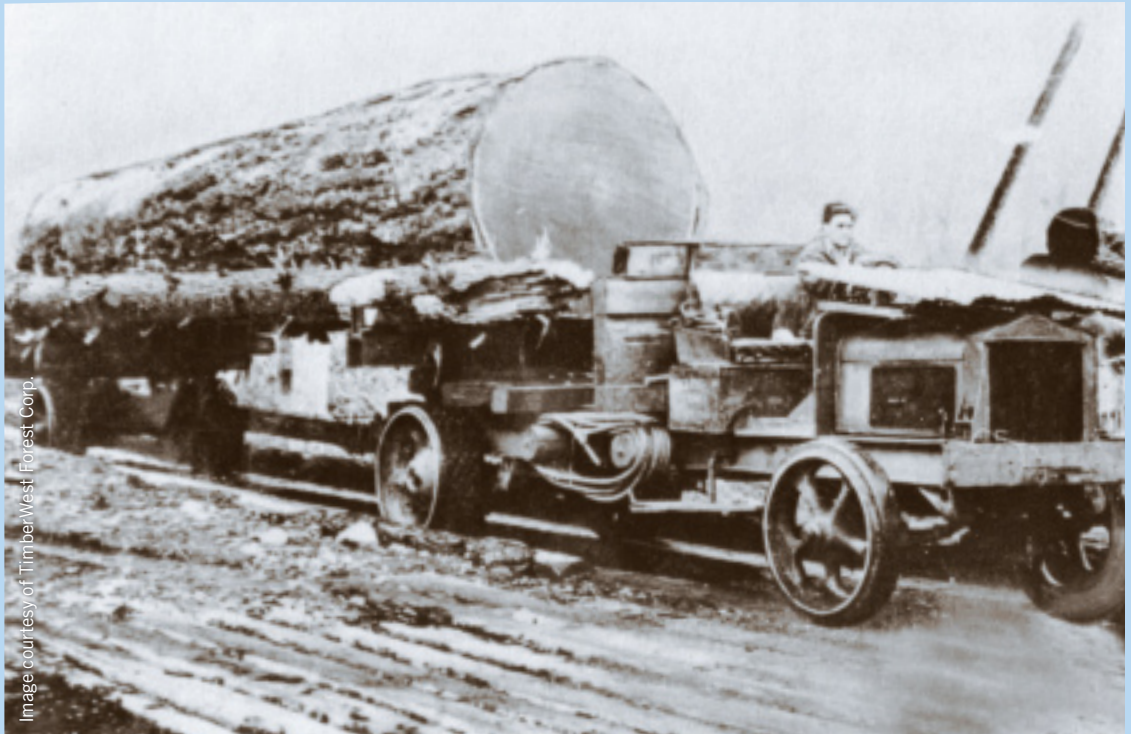


Image courtesy of TimberWest Forest Corp.

This hard-tired truck is hauling one log. The driver is protected by only the railroad ties behind him. Taken in 1924.

Roads and trucks, now considered standard in forestry transportation, have only been a significant presence since the late 1940s. Through the first half of the 20th century, the forest industry developed close to the ocean, or navigable rivers and lakes and water was the primary transportation tool. It's been a long and bumpy road to the high-powered forestry transportation of today.

In the beginning, primary transportation of logs was not an immediate concern as hand logging at the water's edge was expanded upslope by the use of oxen or horses on skid roads—the earliest form of forest road. Skid roads were cleared earth trails, usually stabilized with log skids laying in the direction of travel or puncheon laid perpendicular. Animals were soon replaced with cable systems powered by wood and steam. During this same period, timber was also harvested along existing major rail lines where it was economical to do so.

As timber from these easily accessed

areas became increasingly scarce, the forest industry needed to develop an intermediate means of getting logs out of a forest operation and to a manufacturing site. Steam-powered logging railroads appeared on the coast within a decade of the completion of the Canadian Pacific Railroad in 1885, and by 1917 there were sixty-two of them in operation¹.

Along with steam-powered logging railroads, the use of trucks for hauling logs was well established in the 1920s. Initially equipped with hard solid-rubber tires, early trucks often operated on plank roads 'floating' on railroad-style ties. Power limitations and poor braking hindered the use of trucks as an intermediate transportation system. However, they did complement the railroads as a feeder system and helped develop areas the railroads could not reach.

In this era, roadbeds did not significantly alter the landscape. Large excavations and fills were beyond the economic and physical means of most forest operations. This meant

excavation was avoided and the gullies and rivers were spanned with large elaborately constructed trestle bridges. Railroads peaked through the 1920s and 1930s and steel rails would develop the forest resource for almost half a century before several significant developments took forest operations into a new era.

World War II brought an intense period of technological development in earth movement equipment and vehicle transportation. Machines like bulldozers, mechanical shovels and large capacity trucks – all powered by internal combustion engines – were capable of developing access beyond the physical or economic limits of the railroad. In addition to the new technology, equipment was suddenly available and affordable as the war effort ended.

Simultaneous with the physical and economic ability to develop new territory, a significant political development provided a complementary incentive. The Royal Commission of 1945² led to changes in the

By Dennis Bendickson, RPF



One of the first steam-powered logging railroads, this train of logs was on its way to the Royal City Mills Camp, near Vancouver in 1894.

Hauling logs by oxen down a skid road in the early 1900s.

forest tenure system, the concept of forest (or more accurately timber) sustainability and the availability of an increased land base for forest operations. The new technology and the additional available land base were a perfect combination for rapid expansion. By the early 1950s, forest operations had dramatically shifted from rail to road as the basis of intermediate transportation.

By the early 1970s, foresters and other resource scientists began to expand sustainability principles to non-timber resources sharing the same land base. Forest development planning began to focus on the rate, pattern and sequence of forest harvesting to address management objectives of resources such as fish, wildlife, visual quality and biodiversity. This generally required dispersing harvest activities as much as possible, and as quickly as possible and that dispersal required more road...immediately.

Fortunately, transportation technology was advancing quickly. Log trucks and other

vehicles were becoming more powerful, more durable, and much more 'stoppable.' The versatile hydraulic excavator was proving to be an efficient road construction tool and drilling and blasting rock was now routine. The bulldozers and power shovels of the 1950s were crude and imprecise, typically mixing organics, soils and water to the structural and environmental detriment of the constructed road. The control and power of modern equipment (materials can now be optimally separated and placed) has allowed precision road construction that meets resource managers' objectives.

Bridges were a major limiting factor in forest transportation as long as the only economically practical materials were logs and timber. Glue laminated (glulam) timber beams became popular for spans up to 27 metres in the 1960s but the weight and handling difficulty limited use for longer spans. However, by the late 1970s, steel and concrete became financially viable as alternatives. This ability to efficiently build

bridges made many more areas accessible.

Forest transportation has changed with the evolution of forest lands resource management. Forest resource management has moved from exploitation to sustainability, from financial prosperity to survival, through pro-active and reactive cycles. The long and bumpy road of forestry transportation continues. One of the next challenges in forest transportation is carbon neutrality—perhaps those old-timers were on to something with wood-fired steam.

Dennis Bendickson is an RPF with a career background as a logger, forester and consultant. He is currently with the Faculty of Forestry at the University of British Columbia.

¹ Gould, Ed. 1975. Logging; British Columbia's Logging History. Hancock House Publishers Ltd.

² The Honourable Gordon McGregor Sloan, Chief Justice of British Columbia. 1945. Report of the Commissioner Relating to the Forest Resources of British Columbia.

GRS: Putting Dirt to Work

A N ANCIENT CONSTRUCTION PRACTICE HAS recently been brought to BC and adapted to fit current forestry practices. It is creating a stable earthen structure from alternating horizontal layers of tensile reinforcement and compacted soil. The result is stable and very long lasting; examples include 3,100-year-old ziggurats in Iraq and 2,000-year-old sections of the Great Wall of China in the Gobi desert. Today's structures are called geotextile reinforced soil (GRS) structures and feature modern materials, such as woven geotextile and welded wire mesh facing frames, in addition to local soils.

GRS structures are now being designed by several practitioners in BC, however, Terratech Consulting Ltd. of Salmon Arm initiated the concept in BC and has been the most prolific and innovative to date. More specifically, Terratech has developed designs for GRS retaining walls, GRS bridge abutments (with wing walls), box culverts that utilize GRS abutments and composite GRS and steel superstructures, and open-bottomed GRS arches that require no footings and employ a steel arch as a form for the surrounding GRS fill and headwalls.

Attributes of GRS structures make them ideal for forest transportation construction. They are largely composed of locally sourced granular materials. Only a small number of manufactured, lightweight, modular components are required and these can usually be easily and cheaply transported to the site. Construction is normally done with an excavator, hand compactor(s), and a few hand tools and labourers. Permanent GRS structures are anticipated to last well over 50 years with minimal maintenance requirements. These attributes minimize both the life-cycle cost and the embodied energy of GRS structures making them an attractive, green technology. GRS structures are tolerant of post-construction settlement and can be readily re-engineered on-site, if required. This makes them ideal for coping with actual and unexpected site conditions (e.g., bedrock, soft soil pockets and poor quality fills) and



Fig. 1: Outlet of GRS open-bottomed arch founded on in-situ soils.

typical forestry construction conditions.

FPIinnovations-Feric Division has monitored the construction of several road embankment and stream crossing structures and is publishing its findings in a pair of upcoming Advantage reports about GRS. One of these structures was the prototype open-bottomed GRS arch constructed at the Englewood Division of Canadian Forest Products (now Western Forest Products). Reversing conventional arch function, this crossing consisted of a GRS arch constructed around a structural plate arch 30 metres long and 2.4 metres wide. Because loads are all carried by the GRS, the structural plate arch is only a form for construction and erosion protection, and therefore needs no footings. The structural plate arch is bolted with tie-backs to the surrounding GRS arch (Figure 1).

This design offers significant advantages over conventional arches built on footings and is both more settlement tolerant and easier to construct. Construction cost was about \$80,000 and was estimated to be less than half the cost of the next cheapest alternative—a structural plate arch on concrete footings.

To date, 16 open-bottomed GRS arches have been constructed in BC with the latest using an economical arch form created from half of a Hel-Cor corrugated steel pipe.

GRS structures are being used to solve a variety of resource road challenges, including:

- reducing full bench construction and end hauling requirements for steep slope road building;
- improving vertical or horizontal curve alignments;
- buttressing failing cut slopes and protecting infrastructure from rockfalls;
- stabilizing sliding or settling fill slopes; and
- creating avalanche and debris torrent-resistant road embankments.

FPIinnovations documented a GRS retaining wall constructed by Western Forest Products near Holberg across a steep mountain gully. The GRS retaining wall was safer, easier, and cheaper to construct and resulted in a superior alignment to the full bench road alternative. Using GRS saved an estimated \$20,000 (mostly in end hauling costs) because it incorporated much of the excavated rock.



Photo: FPInnovations

Fig. 2: Geotextile laid across pile caps is backfilled to form the GRS base.

Calvin VanBuskirk, owner of Terratech, recently designed and supervised construction of a pile-supported GRS road embankment to cross a four metre-deep bog near 100 Mile House (Figure 2). A first in Canada, pile-supported GRS embankments have been used in Europe and the USA where space constraints forced construction on weak foundation soils. Design constraints for the BC job included an eight metre-wide running surface (as per British Columbia Ministry of Transport requirements), a pile-supported bridge at mid-span, and non-settling road embankments to either side. Pile-supported GRS offered significant advantages in cost, ease of construction, and environmental impact over excavation and placement of a rock causeway. On-site engineering modifications were required to overcome a variety of construction challenges.

Terratech and Armtex received the 2008 award of excellence from the Industrial Fabrics Association International for this project. VanBuskirk believes that forest bridges constructed in areas with soft foundation soils could be supported on abutments made from pile-supported GRS instead of conventional but more expensive pile driven steel towers.

The concept of GRS is ancient and is all about putting dirt to work. New understandings, developed by researchers and practitioners, are allowing GRS to better meet the transportation needs of the BC forest industry. For example, these structures are easy to construct, can be modified to deal with unexpected site conditions, have a small environmental footprint and have low life cycle costs. The technology has numerous potential applications and practitioners are developing new ones as needs arise. 🐦

Allan Bradley, RPF, PEng, is a senior researcher with FPInnovations – Feric Division. He has 20 years experience in applied research on roads, bridges, truck-road interaction and variable tire pressure.

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Consolidating Resource Road Legislation on Crown Land

CURRENTLY, BC RESOURCE ROADS ON CROWN land are governed by a complex array of legislation administered by separate provincial government organizations. Each organization applies different tenures, levels of enforcement and standards for construction, maintenance, use and deactivation. As resource development and road construction have increased, so have the challenges associated with the current regulatory framework.

Current Regulatory Framework

Multi-industry resource development is expected to intensify and move into more populated and sensitive areas of the province. This will further exacerbate problems with the current regulatory framework. For example, different road-use rules and road safety enforcement levels create challenges for road safety for industrial users and the general public. Meanwhile, disincentives to share existing roads between industrial users create the potential for duplicate road systems and an increased foot print on the landscape.

As standards and enforcement varies across government, companies may have several different administrative and maintenance responsibilities over different sections of the same road. Differences in the fees paid for use of road aggregate between industries also cause problems. In cases where industrial users cannot agree on issues such as user fees, maintenance levels and design standards, there is no efficient and effective dispute settlement mechanism that helps industry resolve issues quickly.

Also, due to differing tenure approaches, forest companies may initiate a process to deactivate a road (as required by legislation) – even though it is still in use or could be used by companies from another industry. Oil and gas companies may be unable to obtain secure tenure over a road into which they have invested millions of dollars and due to differences in the way resource industries recover capital investments in roads, there are disincentives to transfer the road tenure between industry users. Finally, liabilities associated with untenured roads are unquantified, but are known to be increasing.

The Resource Road Act

In response to these issues the government introduced the *Resource Road Act* - Bill 30 into the Legislative Assembly in April 2008. Bill 30 was a very complex piece of multi-industry legislation. This caused government to not proceed with Bill 30 to allow time for further review and discussion with the numerous industries that would have been subject to the legislation. Government sees merit in a single legislative framework for multi-industry resource roads on Crown lands, but recognizes that further analysis is required before proceeding.

Considering a Revised Legislative Framework

The purpose of resource road legislative consolidation would be to establish a single Act covering the administration, construction, maintenance, deactivation and multi-purpose use of resource roads on Crown land. Consolidated legislation would allow a more predictable, fair and cost-effective management framework. This would improve safety and access for all resource road users and bring efficiencies and consistency for industrial users in forestry, oil and gas, and mining.

In particular, new legislation would establish a foundation for addressing resource road safety which has been the subject of recommendations from several key initiatives including:

- Final Report of the Forest Safety Task Force: A Report and Action Plan to Eliminate Deaths and Serious Injuries in British Columbia Forests. (January 2004);
- BC Coroners Service. Frank Leroux Coroner's Inquest. (June 2007);
- Forest and Range Evaluation Program. Report #12: Worker Safety Impacts Associated with Legislation, Policy, Planning and Implementation of Forest Harvesting Activities in BC." (October 2007);
- BC Officer of the Auditor General: Preventing Fatalities and Serious Injuries in B.C. Forests: Progress Needed. (January 2008);
- WorkSafeBC's Proposed Amendments of Occupational Health and Safety Regulations Part 26: (January 2008). Note: WorkSafeBC has deferred new regulations on resource roads under Part 26 pending the progress of Bill 30; and

- BC Forest Safety Ombudsman report "No longer the road less traveled" (February 2008).

In addition, new resource road legislation should ensure there is no impact on existing access management or land-use planning and approval processes. It should maintain the existing levels of free public access and maintain the current access provisions for users such as free miners and for non-industrial commercial recreation users and tourism operators. Finally, it should establish consistent compliance and enforcement programs across industries and establish a level playing field between industrial users in terms of cost recovery, as well as facilitate inter-industry communication and road tenure transfer.

Additional Policy Issues for Further Consideration

Developing a regulatory model that will meet the needs of multi-industrial and multi-purpose users of resource roads on Crown land will require solutions for complex policy questions.

Several key policy challenges must be considered including harmonizing multi-industry standards for construction, maintenance and deactivation, and harmonizing the administration of multi-industry permitting processes. We need to protect existing access provisions for public and non-industrial users. We also need to clarify responsibility for road maintenance and improvements and identify which roads and which road users are to be regulated. Finally, we need to identify which government agency or agencies would be tasked with the administration of resource roads on Crown land.

How to Learn More and Provide Input

The BC government continues to invite input on the overall aims and objectives of resource road legislative consolidation and a website can be found at <http://www.for.gov.bc.ca/mof/rra/>. You are invited to provide your comments by e-mail through the webpage's comments feature. 🐟

Phil Zacharatos assumed the role of Assistant Deputy Minister, Operations Division in November 2008. He will assume the full role of Assistant Deputy Minister during his assignment. Prior to this opportunity, Phil was the Regional Executive Director for the Southern Interior Forest Region.

By Doug Johnston, BSc, EIT
and Julien Henley, MASC, PEng



Asset Management Systems Become Affordable with Third-Party Hosting

FROM BOX CULVERTS CROSSING SEASONAL CREEKS to bridges spanning major rivers there are tens of thousands of structures on thousands of kilometres of resource road throughout BC. Users responsible for the infrastructure usually maintain and update inventories and condition information in many locations and in a variety of formats including binders filled with inspection sheets, spreadsheets containing annual costs, and maybe a database too. Often there is no single source for all the information.

An Asset Management System (AMS) provides fast, simple access to asset information from anywhere Internet access is available without the requirement for specialized software. It is made up of an enterprise database, a Geographic Information System (GIS), and a User Interface (UI).

AMS In Action

In 2004, the BC Ministry of Energy, Mines & Petroleum Resources retained Ledcor CMI to construct a new 22.5 kilometre bypass road and upgrade of the remaining 157.5 kilometres of the Sierra Yoyo Desan (SYD) Road in Fort Nelson. The 188 kilometre SYD Road is multi-user resource road that provides the main access to over 27,000 square kilometres of oil, gas, and forestry terrain in northeast BC, and connects to the Alaska Highway. It is open to the general public, but it is mainly used by the oil and gas industry.

The Ministry of Energy and Mines Concession Agreement set the standards for road maintenance. To meet these standards, Ledcor Highway Maintenance Ltd. was retained to provide road maintenance services. Ledcor hired Associated Engineering to help develop an AMS for road maintenance.

Associated Engineering developed a purpose-built, web-based AMS to manage the large volume of information on the roads and structures and to analyze the results. This database provides Ledcor with a knowledgebase from which to make defensible decisions and perform scenario management for road maintenance priorities and future budget determinations.

The information is current, provides an accurate picture of infrastructure condition and is all in one place. This makes the information easy to share throughout an organization foresters, engineers, accountants, technologists, and maintenance crews can all check the same system and get the same information from it.

In the past, implementing an AMS was a daunting endeavour, in part, because of the large initial capital investment required. This includes hardware and software as well as staff to run the system and their training. There's also on-going maintenance fees and upgrade requirements.

For example, the BC Ministry of Forests and Range runs their own AMS called BRIMS (Bridge Inventory Management System). They conduct annual, close proximity inspections and review of their structures, which include glulam, sawn-stringer, and steel I-girder bridges. Through these inspections, the ministry documents all bridge component conditions, such as potential rot, damage or cracks, and any vehicle safety concerns. Annual reports include recommendations for repairs, cost estimates, priority of repairs, recommendations for load rating, next inspection date, proposed replacement date and photos. By tracking costs and knowing what maintenance and repairs are required, the ministry is able to plan for replacements in the future, undertake capital planning and track their spending. One example of this is the move away from timber rails as they are becoming expensive to maintain when compared to steel railings which have a higher initial cost but lower maintenance cost.

Some organizations which aren't able to make the capital investment to run their own AMS are opting for a more flexible solution—third-party hosting of the AMS on an external server and on-going technical support. Under this model, the third-party AMS provider is responsible for obtaining and licensing the component software upon which the AMS is built, and providing hosting services for the site, including the guarantee of service and required data security, as well as technical support.

Cost for such a service usually involves an initial purchase of the AMS system, and then an on-going fee (monthly, quarterly or annually) for the hosting service. The price varies



Two people using a snoop truck to check the structural integrity of the bridge.

with the size of the project and the amount of customization demanded by the client. This method minimizes the initial capital outlay and ongoing staff and maintenance costs.

For situations where there are multiple users of a road, or section of road, AMS allows for cost apportionment to the users based on the capital and maintenance activities and associated costs that have occurred, or are scheduled. In British Columbia, where our resource infrastructure assets are shared by multiple user groups, private and public, this feature can provide fair distribution of costs.

Under current economic conditions, resource companies and government agencies are continually looking to accomplish more with less. At the same time, there is a requirement to target available funds to areas where they are needed. Third-party hosting of an AMS system is one solution to this problem. 🐟

Doug Johnston, BSc, EIT, is a water resources engineer with Associated Engineering. He has 14 years of water resource experience focusing on fluvial geomorphology, hydrologic and hydraulic modelling, and GIS analysis in the forest and resource sectors.

Julien Henley, MASC, PEng, is manager, resource infrastructure and a senior bridge engineer with Associated Engineering. He has 13 years of experience in bridge design and inspection specializing in projects for the forest and resource sectors.

By Mark S. Boyce, PhD;
Scott Nielsen, PhD; and
Gordon Stenhouse



Grizzly Bears Benefit from Forestry – Except for the Roads



Photo: iStockphoto

The smaller annual harvest footprint created by two-pass forestry benefits grizzly bears.

THERE ARE FAR FEWER GRIZZLY BEARS IN ALBERTA than managers thought—likely fewer than 500 animals province wide—according to recent DNA data published by Alberta Sustainable Resource Development. Some forest ecologists have suggested that larger clearcuts might better simulate the natural disturbance regime that creates good grizzly bear habitats. So, we wondered if changing timber harvest might reverse the continuing declines in bear population. However we found that limiting vehicular access and reducing road density to reduce conflict between bears and humans was the real key to increasing grizzly bear survival.

Working in the foothills of Alberta, we recently compared two models of forest harvest, a traditional two-pass design versus a design with clearcuts of an area that mimics historic fire patterns (Nielsen et al. 2008). We conducted our study using the popular forest simulator PATCHWORKS, which we connected with our research results on grizzly bear habitats and survival. We thought fewer harvest blocks and reduced periods of human activity associated with natural-disturbance-based forestry would benefit grizzlies.

However, just the opposite turned out to be true. Forest patterns in rugged terrain are often highly variable (say compared to

extensive even-aged stands in the boreal forest) so lower volume patches were included in natural disturbance-based forestry. As a consequence, the annual harvest footprint, when trying to mimic natural disturbances, was actually larger than that of two-pass forestry approach. Due to stand silvicultural needs and this larger overall footprint, road densities were higher when attempting to simulate natural disturbances than with Alberta's standard two-pass forestry even though both models logged the same volume of wood.

The grizzly bear is long-lived species with low reproductive rates such that adult survival (particularly females) is the most sensitive demographic parameter influencing population growth. Limiting open road access through planning (road sharing), gating and decommissioning of unnecessary and costly roads has been shown to be an effective conservation tool for recovering threatened grizzly bear populations. (For example, population recovery in Yellowstone and the Northern Continental Divide population in Montana). Limiting vehicular access enhances survival of grizzlies because it reduces the frequency of contact (and hence conflict) between people and bears.

From a habitat perspective, two-pass forestry appears to better serve grizzly bears

because it lowers road density while increasing forest edge, reducing forest patch size, and increasing stand-age variability at scales most relevant to individual grizzly bears. Grizzlies benefit from this fragmented pattern of forests because there are fewer vehicles on the roads, the forests produce more forage and fruit, as well as enhancing populations of ungulates, such as moose. With access management designed to reduce conflict between bears and humans, we suggest that forestry (especially traditional approaches) provides a unique 'win-win' opportunity for conservation of grizzly bears and forest management. 🐻

Mark Boyce is professor of biological sciences at the University of Alberta. His position is supported by an endowed chair from the Alberta Conservation Association. He was a member of the Alberta Grizzly Bear Recovery Team.

Scott Nielsen is an assistant professor of conservation biology in the Department of Renewable Resources at the University of Alberta.

Gordon Stenhouse is a research biologist and program leader with the Foothills Research Institute in Hinton Alberta.

REFERENCE: Nielsen, S. E., G. B. Stenhouse, H. L. Beyer, F. Huettmann, and M. S. Boyce. 2008. Can natural disturbance-based forestry rescue a declining population of grizzly bears? *Biol. Conserv.* 141:2193–2207.

Battle of the Networks of Forest Professionals



Photo: Lisa Brown

Students tour a harvest site and get an on-the-ground forestry experience.



Photo: Jill Werk

Smokey the Bear and a Campbell River forest professional visit an elementary school to read *The Special Gift*.

And the winner is...North Island NFP

First, a large interactive National Forest Week booth was set-up at the local Regional District of Mount Waddington Fall Fair, held September 6th-7th in Port McNeill to promote the upcoming National Forest Week activities. Over 1,500 people walked through the National Forest Week booth, and it received a 1st place award from the Fall Fair organizers. In addition to government, industry, consulting and ABCFP displays, the booth included prize draws, a kids' area and a cross-cut saw competition.

During National Forest Week, the following forestry educational activities were undertaken:

- Local forest professionals presented grade 10 students from the two local high schools with an overview of different career options within forestry.
- Local forest professionals presented Grade 8, 9 and 10 students from one of the local high schools with information relating to the mountain pine beetle.
- Grades 4, 5, 6 and 7 students from 12 local elementary schools participated in interactive forest tours, which included stops at an active harvest site, a tree planting site and a forest trail site. The forest tours were hosted over two days, each forest tour approximately five hours in duration, with the schools combined into a total of six tour groups. The forest tours included a traditional First Nation salmon BBQ for all participants and

volunteers. About 800 seedlings were planted during the event tours to help make the total event Carbon Neutral.

- Local forest professionals presented Kindergarten, Grade 1, 2, and 3 students from 13 local elementary schools (26 classes) with tree identification information. The presentations were interactive, and a copy of the *Tree Book* was given out to each class.

The National Forest Week activities were organized and carried out by 48 dedicated volunteers from Central Coast Forest District, BC Timber Sales, Western Forest Products Inc., Mill and Timber Forest Products Ltd., Strategic Forest Management Inc., and Access Forest Management.

Fifteen schools participated and approximately 850 students benefited from educational presentations or interactive forest tours. No one organization could have carried out the National Forest Week activities, but through collaboration between government, industry and the local consulting companies, all of the planned events were a great success. The feedback received from the various schools involved has been very positive, and it is hoped that similar activities can be planned again next year.

For more information contact:
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BC Timber Sales
E-mail: Lisa.Brown@gov.bc.ca

Miles Trevor, RPF (North Island NFP Chair)
Access Forest Management
E-mail: accessfm@telus.net

An honourable mention goes to...Campbell River NFP

This year we focused on educating elementary school students about forests. At each school we visited students in Kindergarten to Grade 3. We lined up the Smokey the Bear costume and arrived at the school in full forest attire one of us in the Smokey the Bear costume and the other three in our cruise vests and hard hats. We read *The Special Gift* story as we handed out fir cones and cedar seedlings. We demonstrated how to use all the instruments in our cruise vests. We demonstrated the diameter tape by doing a dbh around Smokey's waist! Finally, we had an interactive discussion with the students about trees, wildlife and fire prevention. The students were all smiles as they said goodbye to us and each gave Smokey a high five as he gave away erasers and crayons.

In addition to the elementary schools, we arranged to have the local public library read the story, *The Special Gift*, during their story time session. To supplement the story, we delivered a bag of fir cones and some goodies to be handed out to the children during the session.

For more information contact:
Jill Werk, RPF (Campbell River NFP Chair)
Campbell River Forest District
E-mail: Jill.Werk@gov.bc.ca

Celebrating National Forest Week with Kids and Crayons

WHAT DOES THE FOREST MEAN TO YOU? That's the question over 200 kids answered this September when they submitted their National Forest Week Art Contest drawings. This event, sponsored by the Truck Loggers Association, the BC Forest Safety Council and the ABCFP, was part of the ABCFP's National Forest Week celebration.

Each category had a winner and two runners-up. The winners received a \$50 gift certificate to Chapters and all the kids received a certificate of achievement. Thank you to all everyone who took the time to submit a drawing. Picking the winners was very difficult—so many of the drawings were outstanding. 🐾

Age Category 4-5 Years



Winner: Zachary Noel, Age 5, of Port Hardy, BC



First Runner-up:
Alexis Conroy, Age 5, Pouce Coupe, BC
(Daughter of Rob Conroy, RFT)



Second Runner-up:
Alyssa Bollefer, Age 4, Revelstoke, BC

Age Category 6-8 Years



Winner: Arista Floritto, Age 8, Surrey, BC



First Runner-up:
Elysa DeLuca, Age 8, Comox, BC

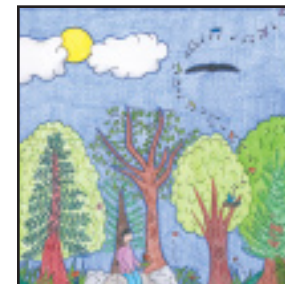


Second Runner-up:
Chantal Cavers, Age 8, Chase, BC

Age Category 9-12 Years



Winner: Taylor Charles, Age 9, Surrey, BC



First Runner-up:
Ranjoat Kaur Chana, Age 12, Surrey, BC

Second Runner-up: Our second runner up couldn't be contacted for permission so we are unable to feature their name and drawing here.



Photo: iStockphoto

Rocky Mountains Losing Whitebark Pine

A FUNGUS INTRODUCED FROM EUROPE IS WELL on its way to rendering whitebark pine trees extinct in some North American national parks, scientists warn. A large proportion of whitebark pines in Canada's and Montana's Rocky Mountains are infested with or already dead from white pine blister rust.

As a keystone species, whitebark pine's absence will cause repercussions throughout the harsh mountain ecosystems it once thrived in. Its presence on exposed spots enables other plants to grow. The tree's ample seeds also nourish wildlife ranging from birds to grizzly bears.

Whitebark pine seed yields have already dwindled. Long before killing a tree, the blister rust can shut down seed production. It strangles the upper branches where the cones in this species are confined. The lack of whitebark pine trees less than 1.3 metres high in 14% of the areas surveyed indicates that seed supply is substantially curtailed.

Where seedlings do sprout, up to one-

quarter are under attack from the rust. Once a young tree develops cankers, it usually succumbs within three years.

Throughout the mountains stretching from Glacier National Park in Montana to Jasper National Park in Alberta, blister rust has infested 57% of the thousands of whitebark pine trees examined by park scientists. Out of the 170 sites inspected, 98% harboured blister rust.

The numbers of dead and infested trees are rising. In Waterton Lakes National Park, where the extent of blister rust was tracked over seven years, infested trees increased by 3% a year. Blister rust had spread from 43% of the pine in 1996 to 71% by 2004. Over the same period, mortality had grown from 26% to 61% of whitebark pines.

The areas most intensively invaded by rust are in northern Montana and southern British Columbia and Alberta, where 73% of whitebark pines are infested. At the northern end of the species' range near McBride, BC, infestation rates are also high, comprising

60% of trees. In between, about 16% of whitebark pines have rust in Yoho, Banff and Kootenay National Parks. The fungus concentrates in moister climates on the western flank of the Rockies, and where other plant species that host blister rust exist.

At the time of this field research in 2004, white pine blister rust had caused most of the whitebark pine mortality. But the demise of whitebark pine is being hastened by mountain pine beetle, whose populations have recently been expanding and spreading. The insect targets older pines, while the rust tends to take younger trees. With the two pests working in unison, both the time left and the options available for saving whitebark pines have diminished.

REFERENCE: Cyndi M. Smith, Brendan Wilson, Salman Rasheed, Robert C. Walker, Tara Carolin and Brenda Shepherd. 2008. Whitebark pine and white pine blister rust in the Rocky Mountains of Canada and northern Montana. *Canadian Journal of Forest Research*. 38(5): 982-995. <http://dx.doi.org/10.1139/X07-182>

Rate Arbitrations Under Bill 13— Distinction Without A Difference

O ON JUNE 21, 2004, THE BC GOVERNMENT AMENDED THE *Timber Harvesting Contract and Subcontract Regulation* (Bill 13) and replaced the rate dispute mechanism. The Government's motive was to establish "a new method to set contract rates that reflect market conditions..."

Undoubtedly, these amendments have implemented some changes of note. For example, they have expedited the completion of rate disputes with mandatory, short-fuse time frames. More obnoxiously, the procedure now requires an arbitrator to limit an arbitration award to five pages. A more childish and short-sighted rule is difficult to imagine. As one arbitrator has already commented, this is "a limitation that does not permit an exposition of the evidence and the submissions which the case deserves." The existence of the five-page rule is unlikely to reduce the efforts of a party to win a rate dispute; it will merely ensure that those efforts are not reflected in the decision, and ensure that the decision provides little guidance in future rate disputes. But at least it's a quick read (and, if necessary, an arbitrator is still free to reduce font and margin sizes).

However, whether the amendments changed the substance of a rate dispute is not so certain—at least on the coast. The new test for an appropriate rate is what "a willing licence holder and a willing contractor **acting reasonably** and at arm's length would agree is a **fair** market rate [boldface added]." Apparently, this language will ensure that the process focuses on market rates. But what does the word 'fair' add to the equation: what is the difference between a 'fair market rate' and merely a 'market rate'?

The old test provided for a rate that "a licence holder and a contractor **acting reasonably** in similar circumstances **would** agree is a rate that ... is competitive by industry standards, and ... **would** permit a contractor operating in a manner that is reasonably efficient in the circumstances in terms of costs and productivity to earn a reasonable profit [boldface added]." This test was said to have led to a subjective 'cost-plus' approach to rates (and, admittedly, a cost-plus approach was taken in many arbitration awards under the old test).

However, with all respect to the many who have suggested otherwise, there is nothing in the old test that mandated subjective cost-plus: it was as objective and market-oriented as the new test. Like the new test, it speaks of license holders and contractors 'acting reasonably' and what they 'would' agree upon if they acted reasonably (as opposed to how they actually operate). While an arbitrator could consider a contractor's actual costs, those costs only had relevance insofar as the contractor was reasonably efficient under the circum-

stances. Cost-plus rate awards were the product of the evidence and submissions that licence-holders and logging contractors placed before arbitrators; they were not a necessary product of the old test.

In both cases, the tests attempt to establish a rate that reflects what the market would set under the 'circumstances.' Under the new mechanism, an arbitrator may still have regard for 'costs' (see section 26.01(2)(e) and (f) of the new mechanism); and under the older mechanism, previous rates that the parties agreed upon were of primary importance (see section 25(2)(a) of the old mechanism).

The simple fact is that the goal of a pure market rate illusory in circumstances where the parties are unable to agree upon that rate. As noted in a recent rate award released under the new mechanism, available comparables may "necessitate so many adjustments and extrapolations that they are not practically meaningful as comparables." If the parties are unable to agree upon a rate, an arbitrated rate will necessarily involve a measure of artificiality. Whether that artificiality is described in terms of a 'fair' market rate as under the new test, or in terms of a rate that "is competitive by industry standards, and ... would permit a contractor operating in a manner that is reasonably efficient to earn a reasonable profit" as under the old test, seems a distinction without a difference. 🐦

Jeff Waatainen is an adjunct professor of law at UBC who has practised law in the forest sector for over dozen years, and currently works as a sole practitioner out of his own firm of Westhaven Forestry Law in Nanaimo.



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Building a Forest Professional Workforce:

The 2008 Registration Exams

CONGRATULATIONS TO EVERYONE WHO WROTE AND PASSED THE 2008 registration exams. These exams were held on Friday October 3, 2008, in 32 locations throughout BC. There were 156 people who wrote the RFT registration exam and 111 who wrote the RPF registration exam.

Each year, coordinating of all the exams seems like an enormous undertaking. But three very dedicated ABCFP staff make it happen by coordinating all the moving parts required to set up exams in 32 different locations across the province. At each location we are very fortunate to have volunteer invigilators who do a wonderful job of ensuring the exam is written according to specific rules. The exams are then marked by a dedicated group of just under 20 volunteers from the board of examiners (BOE) who marked all 267 exams.

The BOE understands that exam writing is stressful for most people. With that in mind, they made a special effort to make out tired handwriting and understand choppy essay structure. I can attest to the hard work they put in to make sure every candidate was fairly assessed.

This year we have three valedictorians—two RFTs and one RPF. The highest mark on the 2008 RFT registration exam Part A was earned by Andrew Davies, RFT, who scored 92% and on Part A and B was Julius Huhs, TFT, at 78%. The top mark on the RPF registration exam was 83% and was scored by Amanda Davey, RPF. Congratulations to this year's valedictorians.

The names of the 2008 successful examinees are available on page 25. These new RPFs and RFTs will be welcomed into the profession at the Inductees' Luncheon at ExpoFor 2009, the 61st ABCFP forestry conference and annual general meeting. This year, ExpoFor is being held in Prince George, BC, from February 26-27, 2009. Visit the ExpoFor website for more information on the technical sessions, social events and registration (www.expoform.ca).



Photo: iStockphoto

Registration Exam Statistics

2008 RFT Exam

A total of 156 candidates wrote the RFT registration exam and the overall pass rate was 94%. Most of the exam candidates were eligible for an exemption from Part B of the exam. The pass rate for people who only wrote Part A, 120 people, was 98%. The pass rate for the 36 people who wrote both Part A and Part B was 78%.

RFT Part A Exam Stats				
RFT (Part A)	2008	2007	2006	2005
Pass Rate	98%	82.0%	79.0%	79.7%
Average Mark	73%	65.0%	63.0%	61.5%

RFT Full Exam (Part A and Part B) Stats				
RFT (Part A & B)	2008	2007	2006	2005
Pass Rate	78.0%	37.0%	55.0%	61.5
Average Mark	63.0%	54.0%	59.0%	59.2%

2008 RPF Exam

The overall pass rate for the 111 candidates who wrote the RPF exam was 71%. Candidates had the option of writing a take-home exam. If they chose this option, they were only required to answer seven of the 14 questions on the October 3rd exam. The pass rate for candidates who chose to write the take-home exam was 72%. The take home continues to be the best evidence of professional quality work from our enrollees.

The pass rate for the two people who did not choose to write the take-home exam, and were required to write 10 of the 14 questions on the October 3rd exam, was 50%.

RPF Exam Stats							
RPF Exam	2008	2007	2006*	2005*	2004*	2003	2002
Pass Rate	71.0	77.0	73.4	68.3	81.0	67.8	72.5
Average Mark	66.0	69.1	67.7	64.1	65.0	62.1	64.3

Successful RFT Examinees

Stuart Abels, RFT
 James Andrew Aitken, RFT
 Gino Amato, RFT
 Graham Herschel Anderson, RFT
 Leona Marie Antoine, RFT
 Jeffrey Yoshio Aoki, RFT
 Robert Stephen Arisman, RFT
 Michael Scott Aspeslet, RFT
 Brian William Atwood, RFT
 Terrell John Douglas Balan, RFT
 Darrell Francis Ball, RFT
 Clive Charles Baudin, RFT
 Sean Joseph Baumann, RFT
 Robert Gordon Bell, RFT
 Brian Roy Scott Bissett, RFT
 Mark William Boucher, RFT
 David Murray Brandon, RFT
 Pieter Broersen, RFT
 Shaun David Bronswyk, RFT
 Brian Emilio Clozza, RFT
 Barry Peter Comin, RFT
 Patrick Edward Cutts, RFT
 Andrew Leslie Davies, RFT
 Shelley Louise Dawson, RFT
 Brian John DeBoice, RFT
 Timothy Lawrence deGrace, RFT
 Justin Brian Dexter, RFT
 Rhonda Lori Dougherty, RFT
 Krista Anne Dunleavy, RFT
 Terrance Conrad Elliott, RFT
 Jeffery Ryan Ernst, RFT
 Leonard Anthony Farrell, RFT
 Anthony William Fast, RFT
 Brian James Feeney, RFT
 Michael Edward Ferguson, RFT
 Robert Charles Ferris, RFT
 David Anthony Flegel, RFT
 Susan Marie Forshner, RFT
 Glen Edward Franz, RFT
 Charles John Gallagher, RFT
 James Kirkman Garbutt, RFT
 Thomas Adelbert Gardner, RFT
 Michael Gregory Gelz, RFT
 Steven Gary Gillette, RFT
 Kelly Lynn Glenn, RFT
 Peter John Goode, RFT

Christopher Philip Gordon, RFT
 Robert Bruce Gray, RFT
 Ryan Richard Gremaud, RFT
 Harminder Grewal, RFT
 Andrew Paul Groom, RFT
 Todd Stephen Gryschuk, RFT
 William George Hazard, RFT
 Gwenn L. Hetherington, RFT
 Dana Timothy Hicks, RFT
 Kelly Peter Houlden, RFT
 Lisa Jane Hudema, RFT
 Julius Huhs, TFT*
 Robert E. Hyde, RFT
 Korinne Fay Anne Isbister, RFT
 Raymond Fredric Jacob, RFT
 Mark Adrian Jones, RFT
 Dennis C. J. Kelly, RFT
 Warren Alexander King, RFT
 Anthonie W.J. Knevel, RFT
 Lyle Joseph Knight, RFT
 Daniel Joseph Krywonos, RFT
 Timothy Edward Larade, RFT
 Kenneth Gary Larsen, RFT
 Donald Clive Lemp, RFT
 Darren Keith Lichty, RFT
 Bradford Monson Lingard, RFT
 Duncan John Mactavish, RFT
 Phillip Aaron McAleer, RFT
 Eric Malcolm McCormick, RFT
 James Ian McDonald, RFT
 James Douglas McIntosh, RFT
 Sean Peter McLean, RFT
 John Brian McPherson, RFT
 Tim Mergen, RFT
 Daniel J. Meronek, RFT
 Donald Gordon Mockler, RFT
 Mary Delina Moran, RFT
 Keith Daniel Mullens, RFT
 Lawrence George Musgrave, RFT
 Yari Ingemann Nielsen, RFT
 George Ove Nohr, RFT
 Timothy Mark Nowe, RFT
 Angela Marie Palmer, RFT
 David W. Panchuk, RFT
 Kevin R. Parker, RFT
 Steven George Payne, RFT
 Mark Everett Petrovic, RFT
 Otto Henry Pflanz, RFT

Aaron Michael George Phillips, RFT
 Stephen Vincent Platt, RFT
 Kenneth James Price, RFT
 Ryan Mathew Price, RFT
 Paul Ricketts, RFT
 Trent Donald Rivet, RFT
 Cara Lee Robertson, RFT
 Michael Gregory Robinson, RFT
 Carl T. Roesch, RFT
 Katherine Rose Rogers, RFT
 Herbert Roodenburg, RFT
 Donald George Rosen, RFT
 Joel Aubrey Runtz, RFT
 Donato Sacino, RFT
 Eric Neil Sankey, RFT
 Jacclyn Marie Saugstad, TFT*
 Michael Glenn Schmah, RFT
 Shane Eugene Sexsmith, RFT
 Trevor Lee Shannon, RFT
 Craig Daniel Shook, RFT
 Daniel Kyle Skafte, RFT
 James Keith Smith, RFT
 Jason Malcolm Leonard Smith, RFT
 Andreas Michael Spangl, RFT
 Greg Donald Spence, RFT
 David Michael Spinks, RFT
 Jay Terrance Strand, RFT
 Daniel Gordon Swan, RFT
 Larry Lesly Taylor, RFT
 Robert Walter Taylor, RFT
 Robert John Thomas, RFT
 Neil Andrew Thronson, RFT
 Maria Suzanne Toms, TFT*
 Julianne Trelenberg, RFT
 Trudy Tremblay, RFT
 Peggy R. Tremblay, RFT
 Benjamin John Trevena, RFT
 John Roger Trevor, RFT
 Richard Turgeon, RFT
 Glen Michael Waatainen, RFT
 Hack Albert Waldon, RFT
 Lisa Helene Waldon, RFT
 Paul Joseph Walsh, RFT
 Robert James Wellsman, RFT
 Debbie Maureen Wheeler, RFT
 Steven Donald Williams, RFT
 John Steven Wilson, RFT
 Richard Lee Winje, RFT

Stefan William Winter, RFT
 Tiffany Gail Wyatt, RFT
 Kenneth Ward Yorston, RFT
 James David Yule, RFT

Successful RPF Examinees

Jesse Thomas Ahtiainen, RPF
 Lori Susan Bartsch, RPF
 Jamie E. Beaulne, RPF
 David Clinton Berg, RPF
 Ryan Richard Biller, RPF
 Katherine P. Bleiker, RPF
 Christopher Andrew Bowie, RPF
 Brendan Brabender, RPF
 Kieran John Broderick, RPF
 Colleen Broekhuizen, RPF
 Nigel Leslie Burrows, RPF
 Rene Jacques Hermus Buys, FIT*
 Jacqueline Cavill, RPF
 Catherine Anne Cunningham, RPF
 Ryan James Cunningham, RPF
 Amanda Elizabeth Davey, RPF
 Laura Leann Gilbert, RPF
 Shane Michael Goretzky, RPF
 Jeremy Luc Hachey, RPF
 Stephanie Nadine Haight, FIT*
 Peter Sean Gregory Hale, RPF
 Jeffery Jason Hamilton, RPF
 Kelvin C.A. Hatfull, RPF
 Kelly Lee Hays, FIT*
 Renata Herrera, RPF
 Thomas William Hoffman, RPF
 David Bradley Holland, RPF
 Shannon Jonasson, RPF
 Kevin James Kenny, RPF
 Eric Michael Kishkan, FIT*
 George Gregory Knoll, FIT*
 Wendi Knott, RPF
 Jodie Krakowski, RPF
 Piotr Kazimierz Kuras, RPF
 Kevin Michael Lafond, RPF
 Steven Richard Lehnert, RPF
 Catherine Lynn Wayland MacKenzie, RPF
 Scott Ryan MacKinnon, RPF
 Christopher James MacNeal, RPF
 Sandra Yin Mah, RPF
 Rodney Walter March, FIT*

Chad Robert Marchand, RPF
 Dieter A. Marder, RPF
 Robert Dean Marshall, RPF
 Sean Mastervick, RPF
 Christopher Paul Maundrell, RPF
 Rick Owen McCordic, RPF
 Lindsey Jack McGill, RPF
 Cameron Stephen Meroniuk, RPF
 Carmen Aldea Minor, RPF
 Sarah Jean Mukai, FIT*
 Leroy Charles Naeth, RPF
 Shane Clifford Neukomm, RPF
 Angeline S.B. Nyce, RPF
 Dion Grant Oake, RPF
 Mark Andrew Pedersen, RPF
 Michael Joseph Pitre, FIT*
 Norma E. Pyle, RPF
 Orrin Christopher Charles Quinn, RPF
 Andrea Rietman, FIT*
 Colleen Ann Ross, RPF
 Kyle Douglas Runzer, FIT*
 Megan Saprunoff, RPF
 Ruby Deanna Saunders, RPF
 Karen Margaret Scheffers, RPF
 William John Schulte, FIT*
 Sharon Jean Sims, RPF
 Johannes Hugo A. Sloos, RPF
 Dillon Thomas Stuart, RPF
 Les J. Szerencsi, RPF
 Lia Catherine Thiesmann, RPF
 Nicholas Ukrainetz, RPF
 Kori Vernier, RPF
 Andrea Karen Vienneau, RPF
 Miguel Viveiros, RPF
 Darrell Joseph Whelan, FIT*
 Lana Elizabeth Wilhelm, RPF
 Terri Louise Worthen, RPF
 Todd Michael Yakielashek, RPF

*Has work experience remaining to complete as of October 3, 2008. Section 7.1. of the Enrolment Policy, allows a candidate to write within 6 months of completing articling/work experience requirement as at the date of the exam. Must meet this requirement before he/she may apply for RFT and RPF status.



Putting BC's Wood Products on the Front Line in the Fight Against Climate Change

OUR FOREST SECTOR IS FACING CHALLENGES NEVER before seen. The US housing market collapse, export losses due to the rise in the Canadian dollar and the catastrophic consequences brought on by the mountain pine beetle have had widespread impact throughout our province.

Surprisingly, as bad as things are, BC's forest industry has before it one of the greatest opportunities in more than a generation. It's an opportunity that will benefit our entire province.

That opportunity lies in the key role that wood can play as a solution to tackling climate change.

Increasingly around the world, people want to learn how to put less pressure on the planet. They want to reduce waste and choose products that are gentle on the environment. Sometimes this means using less, but more often it means choosing products that have a lighter carbon footprint and come from responsible and sustainable sources.

That's why the BC forest industry, Premier Gordon Campbell and then Forests and Range Minister Pat Bell came together recently to launch an unprecedented initiative. It aims to ensure that British Columbians and consumers around the world know that when they purchase BC wood products, they're reducing their carbon footprint and helping to tackle climate change.

So how do BC wood products make a difference?

First, trees help to counteract the effects of harmful greenhouse gases. As they grow, trees absorb carbon from the atmosphere into their leaves, woody stem and roots. In the process, they release oxygen back to the atmosphere.

What few people know is that the wood and paper products we make from trees continue to store this carbon for the lifetime of the product, and many times longer when those products are recycled. In fact,

wood products are 50% carbon by weight. Moreover, the amount of carbon stored in a typical wood-framed house is equal to the cumulative emissions (30 tonnes of carbon) from a car over five years.

Second, wood products are produced using the energy of the sun (in a factory called the forest). That process requires just a fraction of the carbon dioxide (CO₂) emissions of products like concrete, steel and plastic which consume a lot of fossil fuel as they're manufactured. So if we substitute wood for these products, we can achieve further CO₂ reductions, since producing less of them requires less fossil fuels.

Third, wood waste materials and logging 'leftovers' can be used to create bio-energy. This carbon-neutral energy source can help us replace fossil fuels throughout the province and further reduce our carbon footprint. That's why BC's forest industry is already the largest producer of green energy after BC Hydro. And given the extensive volumes of dead wood available – including the pine beetle-killed stands – the potential to increase this green bio-energy production is substantial.

So in a world full of choices, why should customers buy their wood products from British Columbia? Put simply, because, unlike a number of our international competitors:

- Our forests are harvested legally, regenerated promptly and managed sustainably;
- Our industry makes use of fully 97% of the logs during manufacturing and promotes re-use through recycling;
- Our industry welcomes independent scrutiny of how our forests are managed; and
- Our industry is a leader in using wood-waste and converting it into bio-energy.

Of course it all starts with BC's sustainable approach to forest management and keeping

our forests healthy and growing. BC's forests represent an important carbon reservoir, but they don't absorb carbon dioxide at the same rate over time. With effective, long-term management of our forests, we can increase the amount of carbon stored.

A tree absorbs the most CO₂ when it's young and growing. As it gets older, its ability to absorb carbon gradually declines. And when it starts to decay and dies, it begins to release its stored carbon back into the atmosphere. As beetle-killed forests decompose, for example, the carbon they release contributes to global warming. They're also more susceptible to lightning strikes and fire—and that means a rapid release of CO₂.

We can prevent this carbon release and at the same time, increase the size of BC's carbon reservoir, by:

- Managing our forests to keep them healthy and growing;
- Harvesting at the right time and manufacturing products that continue to store the carbon;
- Switching from using fossil fuels to wood waste bio-energy; and
- Using wood products in place of higher impact products like steel and concrete.

As the world increasingly understands the role of forests and wood products in helping to tackle climate change and BC's value in this regard, our province and industry are well-positioned to be the global "supplier of choice."

And as we realize this potential, we will revitalize BC's forest industry and provide new hope and economic stability to families and communities throughout our province. 🌲

Ric Slaco, RPF, is the vice-president and chief forester for Interfor, based in Vancouver. He is also the chair of the BC Forestry Climate Change Working Group.



Interest

Mel Scott, RPF; Jane Perry, RPF; and Ralph Winter, RPF

Fertilization and Carbon Sequestration in BC Forests

Introduction

Forest fertilization is a silviculture treatment used throughout the world to increase tree growth and reduce rotation age. Fertilization of BC forests began on the coast in the late 1970s and in the Interior during the next decade. Approximately 18,000 ha of Crown land were fertilized in BC in 2007, and the Forest Investment Account will fund the fertilization of 25,000 ha in 2008. British Columbia has extensive research results on stand growth response to fertilization based on site, stand conditions, nutrient mix and other criteria, to add to significant operational experience.

The fertilization program is expanding to address three key purposes in BC. Coastal forest fertilization will help make second-growth stands available sooner for harvest. Fertilization of Interior forests will help to address the mid-term timber supply falldown after the mountain pine beetle epidemic by reducing rotation length. And finally, the additional wood produced from fertilization will sequester, or store, carbon from the atmosphere. With the carbon sequestration role of forests included in the new Climate Action Plan, fertilization has become an even more useful and practical silvicultural tool.

Carbon Sequestration

Trees sequester carbon as they grow by taking in carbon dioxide (CO₂) from the atmosphere and converting it to biomass. Using BC Ministry of Forests and Range projected stemwood growth responses, with 1 m³ of wood containing about 0.25 tonnes of carbon and 1 tonne of stored carbon removing 3.67 tonnes of CO₂ from the atmosphere, approximate rates of carbon sequestration from fertilization, for the coast and Interior, can be calculated, as shown below:

	Coast	Interior
Project stemwood growth (m ³ /ha)	30.0	15.0
CO ₂ removed from the atmosphere (tonnes/ha)	27.5	13.8

Forest managers have begun to investigate the relationship of carbon inputs and outputs for different management practices and regimes. This summary provides estimates of the amounts of CO₂ (or equivalent) produced through all stages of forest fertilization using urea (46% nitrogen [N]), from fertilizer manufacture through to greenhouse gas emissions after application. Notes explaining the origin of the numbers are provided in the full document, which is posted on the Forests for Tomorrow website in the Guidelines and Standards section.

Greenhouse Gasses Resulting from Urea Production, Transport and Application

Increased CO₂ in the atmosphere is linked to climate change and is therefore being examined as a byproduct of forest management practices. Nitrous oxide (N₂O) and methane (CH₄) are also important greenhouse gasses and can be referred to in terms of carbon dioxide equivalent (CO₂e).

Fertilizer manufacture

The manufacture of each tonne of urea results in about 1.8 tonnes of CO₂e emitted to the atmosphere. A typical application rate in BC forests of 0.435 tonnes of urea/ha means that about 0.8 tonnes of CO₂e/ha is attributed to urea manufacture.

Fertilizer transport and application

Fertilizer transport requires an average of five litres of diesel per hectare fertilized, which produces 0.014 tonnes of CO₂e. Fertilizer application requires six litres of aviation fuel per hectare fertilized; a helicopter engine burning that amount of fuel emits 0.016 tonnes of CO₂e.

Greenhouse gas emissions following fertilizer application

Using an estimate of one percent of applied N converting to N₂O leads to the equivalent of 0.95 tonnes of CO₂e/ha being emitted as N₂O. (The carbon in urea is released as CO₂ upon hydrolysis after application and is not included as an emission, since it was considered in the manufacture process.)

Total equivalent carbon dioxide emission

$0.8 + 0.014 + 0.016 + 0.95 = 1.8$ tonnes of CO₂e/fertilized hectare

Summary

The ratio of carbon sequestered by fertilized trees to the amount of greenhouse gas released into the atmosphere through all stages of forest fertilization (i.e., CO₂ stored/CO₂e emitted) is approximately 15.3 for coastal forests and 7.7 for Interior forests (27.5/1.8 and 13.8/1.8, respectively).

Fertilizing 25,000 hectares in 2008, based on roughly equal portions of coastal and Interior forest, will result in approximately half a million tonnes of net CO₂ sequestration in the boles of fertilized trees, while helping to boost coastal Douglas-fir second-growth and the BC Interior's mid-term timber supply. This estimate, however, excludes carbon storage in roots and soil organic matter, which may also increase following fertilization.

Acknowledgements

The authors thank Rob Brockley, RPF, and Gordon Weetman, PhD, RPF, for their technical contributions and guidance in the development of this summary.

Websites

Forests for Tomorrow

www.forestsfortomorrow.ca/GuidelinesAndStandards/Fertilization/related-docs-websites/related.htm

Coastal Forest Action Plan

www.for.gov.bc.ca/mof/CoastalPlan/cap07.pdf

Mountain Pine Beetle Action Plan

www.for.gov.bc.ca/hfp/mountain_pine_beetle

Climate Action Plan

www.livesmartbc.ca/plan/index.html

Silviculture Strategies

www.for.gov.bc.ca/hfp/silstrat/index.htm

Malfair (Mel) Scott, RPF, is a graduate of UBC Forestry and the Silviculture Institute of BC. Mel is a consultant involved in silviculture.

Jane Perry, RPF, is a consultant specializing in facilitation and technical writing. She enjoys continuing to work with other stand tending veterans from her earlier Forest Service days.

Ralph Winter, RPF, is a stand management officer for the Ministry of Forests and Range.



Thematic Maps Help Manage MPB Impacted Stands

AT BOTH THE PROVINCIAL AND LOCAL LEVELS, thematic maps will provide a better understanding of the severity, age and location of mountain pine beetle (MPB) attack. MPB thematic maps are GIS-based (Geographic Information Systems), which enable the depiction of different layers of spatial information, including MPB attack status, severity, site productivity, age of the timber and the attack.

Thematic maps have been reconciled to the Timber Supply Area boundaries; Tree Farm License boundaries and major fires which occurred after 1997 are also indicated. In addition to the MPB material, an interactive thematic map has been developed for each management unit. Layers of information may be added or removed at the user's discretion, such as biogeoclimatic zones, streams, roads and protected areas.

When planning operational activities in MPB impacted stands, forest professionals may use some or all of this information, depending on the work and activity they are considering. For example, the severity of attack and age class are important considerations in locating salvage and reforestation opportunities in severely impacted mature pine. The date of the MPB infestation, which relates to the shelf-life of the timber, may be inferred from the attack status—red, new grey and old grey (or one, three to five, and six or more years old, respectively). This information may be collectively utilized to organize reconnaissance work, surveys and further planning of operations.

Forests For Tomorrow contractors and Ministry of Forests and Range planners are expected to be key users of this information. Silviculture strategies which are in place for each management unit may be adjusted to reflect the changing MPB conditions across the landscape. Five year operational plans can be developed with more clarity, given the perspective of MPB damage outlined in the maps. Reconnaissance work and field surveys may be located and organized more efficiently, which will assist in the preparation of future annual business plans.

Map sets have now been posted for 22 Interior management units. Maps such as the



This thematic map shows the MPB attack status of trees in the area.

example shown here can be downloaded by region (northern or southern) or management unit. For ease of use, they may be viewed in PDF format on any computer with Adobe Reader version 7.0 (or newer) installed. To access the MPB thematic maps, please refer to the Remote Sensing, Geo-Spatial Applications website at: http://www.for.gov.bc.ca/hts/rs/mpb_impact.html

MPB thematic maps were developed from several sources of information, including three years of federally funded MPB inventory and monitoring work, orthographic photos, remote sensing, red/grey attack maps and forest health surveys. Future updates and refinements will be funded through the provincial Forests For Tomorrow program.

This project was a collaborative effort involving the Regional Forests For Tomorrow and Inventory staff, and the Forest Practices, and Forest Analysis and Inventory Branches of the Ministry of Forests and Range. Technical support was provided by Caslys Consulting Ltd. of Brentwood Bay, BC.

Local Information Sessions

Several sessions will be scheduled to introduce MPB thematic mapping and its uses. Licensees, Forests For Tomorrow and general silviculture contractors/planners are encouraged to attend these sessions, which will be held in some regions/districts during the first quarter of 2009. Please contact Ann Blyth of Caslys Consulting at ablyth@caslys.ca or me at Graham.Hawkins@for.gov.bc.ca for further information. ☺

Accessing MPB Thematic Maps

Please visit the Remote Sensing, Geo-Spatial Applications website at: http://www.for.gov.bc.ca/hts/rs/mpb_impact.html

Graham Hawkins is a registered professional forester and team leader for Inventory Planning and Implementation. He has worked for the Ministry of Forests and Range for over 18 years, where he has been involved with operational and forest development planning, information management, MPB mapping and the provincial forest inventory.

In Memoriam

It is very important to many members to receive word of the passing of a colleague. Members have the opportunity to publish their memories by sending photos and obituaries to **BC Forest Professional**. The association sends condolences to the family and friends of the following members:

Bernice Patterson

RFT #213
1950 - 2008

Bernice passed away on Remembrance Day after a long battle with cancer.

She leaves a legacy of high work standards, a tremendous work ethic and a dedication to the work she chose. Originally from Ontario, Bernice attended Selkirk College and graduated from the forestry program. She worked in the East Kootenays, in the Stewart area and since 1994 in the Pemberton area. She recently became a Registered Forest Technologist in order to better serve her clients. In Pemberton, she worked for CRB Logging Co. Ltd. and Garibaldi Forest Products and through a variety of joint ventures, did much work on First Nations tenures for the N'Qua'Qua (D'arcy), Mt. Currie and Skatin bands.

Bernice was committed to her clients and determined to see grass roots economic and forestry success from her efforts. She was especially devoted to her First Nations clients, always trying to improve commerce and employment. She often went far beyond the call of duty to help young band members get work in the woods.

Bernice's recreational interests were golfing, cycling and kayaking. She was active in her community including her work on improvements to the Pemberton Industrial Park.

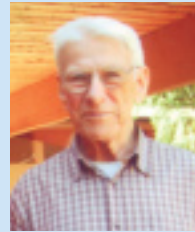
Bernice always set a good example in forestry, business and in the community. She cared and made a difference.

Bernice is survived by her mother, two sisters and two brothers and their families. She also leaves many friends and forestry colleagues in the Pemberton area and beyond.

Submitted by Don Avis, RPF

Richard Kempson Vivian

RPF(RET) #223
1922 - 2008



Dick Vivian passed away on Sunday, October 19th in North Vancouver at the age of 86 years.

Dick was born in 1922 in Vancouver. He graduated from Victoria High in 1940 and then apprenticed as a land surveyor. He joined the military in 1942 where he served as a bombardier in the RCA Corps in Europe. Following WWII he attended UBC and graduated with a BSF in 1951.

He spent his entire career with Alaska Pine and Cellulose and successor companies until his retirement as chief forester of Western Forest Products in 1987. He played an important role in developing working relationships between logging and forestry in the company and strong linkages with his colleagues in the BC Forest Service.

Dick was a conservationist at heart and instigated a series of fisheries awareness programs and supported industry involvement in salmon enhancement. As a practical forester, Dick placed high importance on understanding the information he was given making sure the numbers fit with his "back of the envelope" calculations. Nevertheless, he put much energy and persuasion into acquiring a new GIS mapping system for the company.

Dick was a quiet man of high integrity, soft spoken and a consummate professional forester. His knowledge and perception of issues, particularly government policies and actions was impressive. Loath to "jump on the train" without lots of thought, he needed to know the direction it was heading. He was a good and loyal friend to many and respected by all who knew him. Loggers appreciated his understanding of their challenges and his efforts to keep operations running smoothly.

He had a passion and love for drama and history and visited many London theatres following retirement. He was an expert spinner and his yarn won several awards at competitions around the Lower Mainland.

Dick is survived by his wife Arlene, his brother Ben and many nieces and nephews.

Submitted by Dick's colleagues, friends and family.

BRIAN BARBER, RPF

Brian recently won the competition for Director, Tree Improvement Branch, BC Forest Service. Brian also received his MA in Environment and Management from Royal Roads University in November 2007. Brian still resides in Victoria with his wife, Yoshi, and their three children (16, 14 and 9 yrs).

ADAM CULOS MBA, RPF

Adam was awarded an MBA in Executive Management in June from Royal Roads University. He accepted a new position as the Director of Forest Resource Valuation with Triton Logging Inc. in September.

JOHN GOODING, RPF

John was recognized at the BC Forest Safety Council's appreciation day. He won the Safety Leader of the Year Award for advancing forest safety in BC through delivering or developing new standards, training, systems, tools and other methods of improving safety practices.

ANDREA LYALL, RPF; DAVID PATTERSON, RPF; AND MICHAEL NASH, PAST ABCFP LAY COUNCILLOR

Andrea, David and Michael were appointed to the Forest Practices Board in December. Bruce Fraser, chair of the Forest Practices Board, said in a written statement, "This trio brings an extensive knowledge of forestry-related issues to the table, and will make a significant contribution to our work."

Congratulations to all from the ABCFP.

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