

JANUARY - FEBRUARY 2013

BC Forest

PROFESSIONAL

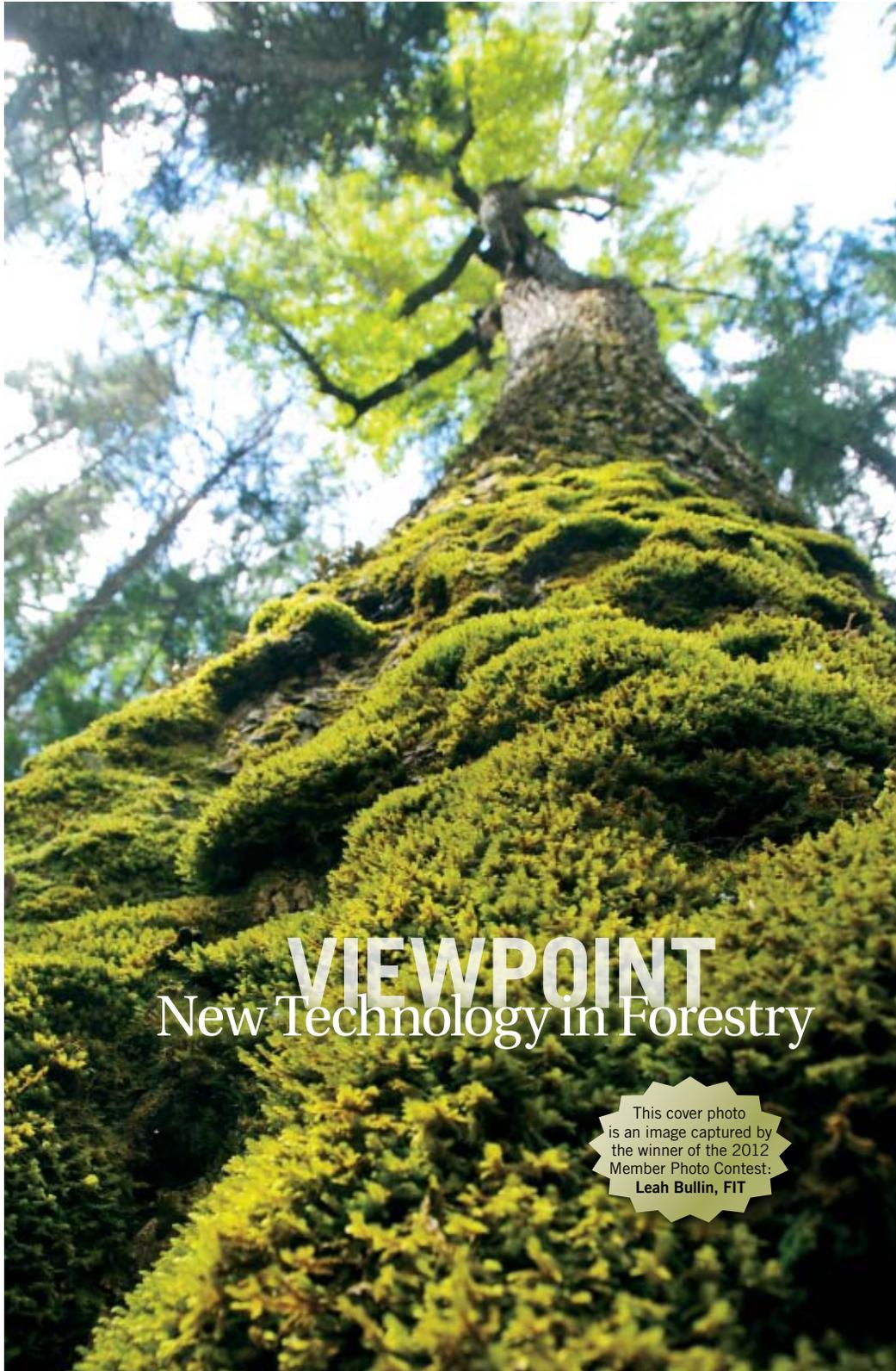
Technological Change:
From Pencils to iPads

National Forest Week
Art Winners!

Introducing LiDAR:
A Case Study in Ontario

VIEWPOINT
New Technology in Forestry

This cover photo
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Leah Bullin, FIT



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Photo: Trina Moyles

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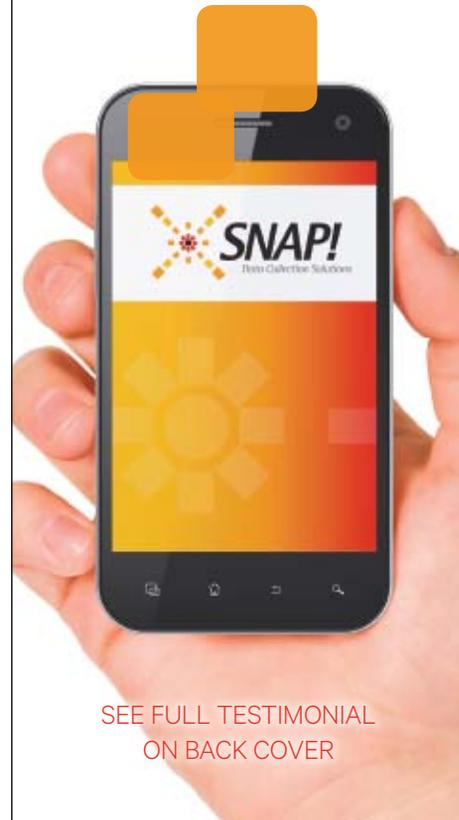
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"In the field it has saved us time and simplified field surveys. In the office it has saved us a significant amount of staff time"...



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Embracing Change, Will it Always Be on Tomorrow's Agenda?

RE: Intensive Silviculture...The Grand Illusion by Alan Vyse, RPF, and Ian Cameron, RPF, (*BC Forest Professional*, September-October 2012).

While I agree with Vyse and Cameron's opinion of intensive silviculture being a "shining grail" for most British Columbian forest professionals, I wonder what the alternative looks like and more importantly, how are we to go about implementing it? Which makes me wonder, how will change be realised? New ideas for forest management look nice on paper, but I see little progress towards the long-term vision of sustainable forests.

In light of the pressure from the mid-term timber supply the implementation of forest regeneration is an opportunity for change. How silviculture is applied may have a chance to progress towards landscape management; not only in legislature but in the field as well. Perhaps fresh opinions are needed to direct this movement, but the experience of those who have been in this industry is invaluable and not to be dismissed.

Silviculture is possibly the keystone of forest management, yet like Vyse and Cameron stated, research trials are practised on small scales. Even today, little is understood about the non-timber factors that contribute to healthy regenerating forest, and there is resistance to lessening the focus of current management standards on timber products. Is embracing change something that will always be on tomorrow's agenda?

The many demands of, and interests in, the forest landscape require that forest professionals use a variety of treatments. In thinking about variety, what are our goals for intensive silviculture? Are we willing to wait for the high volume timber to develop? Timber and non-timber values will benefit from less 'intensive' practices as more attention is lent to accepting complexity.

AMANDA MJOLSNESS
STUDENT, UNBC FOREST ECOLOGY
PRINCE GEORGE

Kudos for BCFP

As a one-time forestry worker executive, let me tell you how much I enjoyed your November/December issue and its discourse on the present state of the profession and our forests!

RALPH SULTAN, MLA
WEST VANCOUVER



UBC Faculty of **Forestry**
University of British Columbia

Master of Sustainable Forest Management

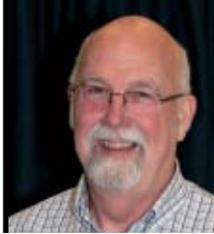
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Technological Change: From Pencils to iPads

Wikipedia defines technology as “the making, modification, usage, and knowledge of tools, machines, techniques, crafts, systems, methods of organization, in order to solve a problem, improve a pre-existing solution to a problem, achieve a goal, handle an applied input/output relation or perform a specific function.”



About the photo: Steve Lorimer, RPF, and Ken Zielke, RPF, at the entrance to the Pulaski Tunnel (Ed Pulaski invented the namesake tool). This site is featured on the National Register of Historic Places in remembrance of the great wildfire of 1910, the largest wildfire to date in the United States. Racing faster than 60 miles per hour, this fire burned over 3 million acres of land throughout Northern Idaho, Eastern Washington and Montana in just two days. During the course of the fire, many lives were endangered including US Forest Service Ranger Ed Pulaski and his crew of 45 firefighters. Pulaski led his crew to an abandoned mine to seek shelter from the intense firestorm. Threatening to shoot anyone who tried to leave, Pulaski stood watch at the entrance beating off flames entering the tunnel until he passed out. Although all the men lost consciousness during this intense time, nearly all survived. Today, the site serves as a tribute to the dedication and courage showed by Pulaski and his crew and all firefighters who risk their lives to protect our land.

So many applications to forestry; so many opportunities to improve forest management! This issue's theme of 'new technology in forestry' should provide some interesting perspectives on the opportunities open to us as forest professionals.

From a personal perspective, I find it amazing to think of the many changes in technology that have occurred during the time I've been a forester. When I graduated from UBC (in 1972 for anyone wondering), we had no cell phones, Internet, e-mail or fax machines. Computers were a pretty rare item. If you had access to one and wanted to run a program, it would involve packing a box of key-punched cards containing the program to a card reader, running them through the computer and waiting for your turn to pick up the answer – all for a small fee, of course.

One summer before I decided to go into forestry, I was fire fighting near Hope, BC. When I first arrived on site there was no access to water and our crew was instructed to hand dig a guard around the outer perimeter

of the fire. Our high-tech tools included shovels and pulaskis. I quickly discovered how hard it was to dig around rock and cut through roots so I gave no thought to the fact that the pulaski resulted from a 'technology' change some 50 years prior—one that combined the axe and mattock into one tool.

The photo above shows Ken Zielke, RPF, and I standing at the entrance to an old mine shaft near Wallace, Idaho. And what does that have to do with new technology in forestry? As it turns out, in 1910 there were massive fires in the area of Idaho, Montana and Washington state. One forest ranger and his 45-man fire-fighting crew were in danger of being overtaken by the fire which was fanned by hurricane-force winds, so they sought refuge in this mine shaft. This forest ranger was Mr. Edward C. Pulaski. While credited with saving all but one of his men from the fire as it roared past the mine shaft, Mr. Pulaski's other, and perhaps better known contribution to forestry



CEO's Report

By Sharon L. Glover, MBA

It's time to vote for updated Bylaws

The changes the government made to the *Foresters Act* last year kicked off a project at the ABCFP to update our bylaws. A subcommittee of council and staff members looked at most of the bylaws and grouped the necessary changes into several areas: compliance with the *Foresters Act*; and modernization and housekeeping.

The subcommittee tackled the most important area first – making the bylaws compliant with the Act – and members ratified those changes in 2012. Now we are modernizing and making some housekeeping changes to the bylaws. This work means updating the bylaws with current practice as well as eliminating the repetition with the *Foresters Act* that has crept in over the years.

There are more than 60 changes necessary to update the bylaws. Some changes are very simple wording changes while others are much more complex and involve completely re-writing a particular bylaw. All of these changes must be approved by a vote of our members. Because of the large number of changes, we have decided to break the bylaws into four batches and have members vote in four bylaw ballots. Beginning in mid-January, after the council election is over, you will receive an invitation to vote in a bylaw ballot about once a month for four months. With each invitation, you will receive information on which bylaws you are being asked to approve including the current wording, new wording and the rationale behind the changes. All of this information will also be available on our website.

In addition to the work that has been completed, there will be some additional work done on Bylaw 10, the Use of Professional Seal and Signature, and Bylaw 12, Standards of Professional Practice. Bylaw 10 has proved to be unworkable with members. The most common feedback the association receives when carrying out practice reviews is that Bylaw 10 is confusing and not easy to abide by. A more practical version of the bylaw of what the association requires with signing and sealing professional work will be drafted soon for member review as well as a measure or verify standard of practice.

There is very little cost to the ABCFP to run these bylaw ballots as we use our existing systems. The only real costs are printing and mailing paper ballots to members who have requested them. If you currently receive a paper ballot and would like to receive an electronic one, you can change your voting preferences on the website at any time.

Voting in a bylaw ballot is a responsibility of membership. We encourage you to take this responsibility very seriously and cast your vote in each ballot. For information on the bylaw changes, please contact Brian Robinson, RPF, director of professional development and member relations. He can be reached at brobins@abcfp.ca. For questions about the voting process, please contact Michelle Mentore, senior communications specialist and webmaster. Michelle can be reached at mmentore@abcfp.ca. 🍌

ABC FP Is Improving Our Practice Review Process

In order to offer a stronger assurance to the public of our members' competency, we will be changing our Practice Review process beginning in 2013. Instead of choosing 70 random members for an administrative-based practice review, we will be choosing 70 members based on their aspects of professional practice and requiring them to carry out peer reviews. In addition, we will carry out a small number of risk-based practice reviews which will evaluate technical and professional details of member professional practice.

Since we have received positive feedback from members who have completed peer reviews, we felt peer reviews would be more beneficial to members than administrative-based practice reviews. Members not selected for a mandatory peer review may still choose to carry out voluntary peer reviews with their colleagues.

Only registered members, special permit holders and Natural Resource Professionals will be required to participate in this new quality assurance program. Stay tuned for more details in the new year. If you have any questions, please contact Brian Robinson, RPF, director of professional practice and member relations at brobinson@abcfp.ca.



It's More than Logging: Check Out Our Second Recruitment Video

Host Steve Baumber, RPF, is back and visiting more forest professionals on the job! In this video, Steve shows you some of the different forestry jobs that are available to young people. Featured in this video are members: Mikel Leclerc, RPF; Dean Iverson, RFT; Sheldon Connolly, FIT; Tracy Godin, FIT; Johnson Ginger, RFT; and Darrell Frank, RPF. Watch the video on our website.

Official Notice of the AGM

The ABCFP's 65th AGM will take place on February 21 from 5 to 6 pm as part of the Forestry: The Future is Growing conference in Prince George. All members are invited to attend the AGM portion of the conference free of charge and pre-registration is not required. The AGM will take place in the Prince George Civic Centre at 808 Civic Plaza. The agenda will include the following items:

- Adoption of minutes of the previous annual general meeting;
- Adoption by resolution of annual reports;
- Adoption by resolution of the audited financial statements;
- Appointment by resolution of auditors;
- Appointment by resolution of one (1) or more the returning officer and scrutineers for the purposes of Bylaw 4.9;
- Reporting of council election results;
- Ratification by resolution of actions taken by council and staff on behalf of the association in the preceding year; and
- Any other business specified in the notice of meeting.

Only registered members in good standing may vote at the AGM.

Congratulations to the Valedictorians!

This year we have two excellent valedictorians who achieved the highest marks on their respective exams. The highest mark on the 2012 RFT registration exam was earned by Megan Louise G. Tandy, TFT, of Prince George who scored 86%. The overall top average mark from the two parts of the RPF registration exam was 87% and was scored by Melissa Lauren Kirk, RPF, of Black Creek. Congratulations to this year's valedictorians!

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Glen Frank, FIT, doing a cruise check on a very cold day near Chetwynd.

Photo: Trina Moyles

New Technology in Forestry

TECHNOLOGY CHANGES AT AN INCREDIBLE PACE. MANY OF US STARTED OUR CAREERS before e-mail, when faxing was the fastest way to send documents across long distances. Today, we don't remember how we survived without e-mail, laptops and smart phones. Forestry is no different... Gone are the days when you could do everything with a pad of paper, pencil, compass and prism. Today we have remote sensing, GPS and tablet computers to help us work in the bush. In this issue of **BC Forest Professional** magazine, we feature new technology in forestry. Authors explore a number of ideas including whether or not cloud computer is a benefit to forest professionals, how software revolutionized timber cruising and how LiDAR has provided a wealth of information to forest professionals and academics.

Also in this issue you'll find our exam special feature. On these pages you'll learn about the valedictorians and see a list of the successful candidates who will be formally inducted into the ABCFP at the Inductees' Recognition Lunch at the ABCFP's conference in February. Will you be there?

Finally, we have a number of articles that will be of interest to many of our members. Learn more about the new Master of Sustainable Forest Management at UBC, landscape fire management, and leadership. We've also included our National Forest Week contest winners so be sure to take a look at the cute pictures children drew to represent what forestry means to them. 🌲

The Principles of Forest Stewardship¹ and the use of New Technology (new tools in the digital age)

Forest management presents us with an interesting dichotomy. While it requires knowledge and application of age-old arts and techniques, it can be greatly enhanced when we embrace and integrate new technologies. New technology may save time or present entirely new options for managing the forest. Forestry is no longer a low-tech industry. While we still use hand tools and get our boots muddy, we also employ cutting-edge technology on a daily basis. This includes the integration of GPS receivers, high resolution aerial imagery and software that runs on hand-held devices and populates databases right from the field.

The Principles of Forest Stewardship speak to the acceptance of our embrace of new tools and technology in a number of ways. Principle 6, Spatial Strategies, states that 'stewardship ensures that an appropriate range of spatial scales are used to monitor, assess and plan forest management activities.' This principle implies that forest managers must understand the impacts of site activities on the larger ecosystem. One example would be how the removal of the overstorey in a single cut-block affects the hydrologic processes within the larger watershed. In order to measure and assess these impacts, managers use GIS systems that enable complex queries at small or large scales and use multiple layers of information. The layers of data can now be populated with speed and accuracy, from forest inventories collected remotely by aircraft or satellite, using high resolution aerial imagery.

The ability to harness large volumes of data in this way and at a variety of scales, allows the landowner or manager to predict impacts before they occur. Once verified, this information can then be used by forest professionals to minimize negative impacts by modifying practices, such as varying the size and location of riparian and wildlife leave patches, thereby improving forest stewardship over the landscape.

¹ The main document can be seen at http://abcfp.ca/publications_forms/publications/committee_reports.asp

New Technology in Forestry:

Forestry Managed

PROFESSIONAL FOREST MANAGEMENT HAS ALWAYS RELIED ON DETAILED information, but recent technology has changed the way we store, reference, and analyze this information. When I began my forestry career in the late 80s, the forestry databases were filing cabinets, maps were hand drawn, finding your current location on a map was almost an art form, and a GPS device was so big it was usually carried in a customized backpack. This has all changed dramatically and, as most of us are aware, it is still changing.

In the past two decades, most of the information we manage in forestry has moved from paper to databases and now, just recently, the 'Cloud'. At the same time, we have also seen the portability of our computers change from bulky desktop PCs to small, ultra-portable tablet computers such as the iPad with built-in GPS, high-definition camera, and Internet connectivity all in a device that weighs less than a kilogram. This evolution in data storage and portable computing devices is the driving force behind new computer programs being used in forest management.

'Cloud computing' generally refers to data and applications that are accessed over the Internet. These applications and data are usually replicated to multiple servers working remotely in concert to provide scalable storage space and computing power. Typically these cloud servers are accessible via the Internet, which makes the applications and data in the cloud available from any place with Internet access.

We are at the dawn of cloud computing for forestry. Almost everything we do in forest management, such as prescribing, planning,

coordinating, monitoring and recording forest activities, is recorded and related to maps. Most of this data is stored in a GIS database that requires large amounts of data storage and powerful computer systems to access it. This is where cloud computing really fits well by offering cheap data storage and scalable computer processing power on demand. ESRI, a major provider of GIS software, is now offering its software as cloud-based services so that customers can avoid the cost of owning and maintaining their own servers and get improved processing power and future scalability. In addition to potential cost savings, moving GIS to the cloud opens the door for new potential uses by making it more available in the field on portable devices (such as an iPad). And since most of the computing is done on servers in the cloud, even small devices can deliver speedy GIS performance. At JRP Solutions, we have been adding cloud-based services to our software platforms as well by utilizing a central server for sharing data across multiple users. For example, we make it simple for someone using our software on an iPhone to share data with someone using an Android or laptop.

Another huge advantage of cloud-based software is the improved accessibility of data via Internet connections, which are more available than ever. Near urban centres, cell phone networks now offer inexpensive, fast Internet access that is comparable to your home or office. In remote locations, Internet access can be easily set up with satellite phone providers. To attract summer student workers to their company, many silviculture contractors now provide satellite Internet access in their remote camps as an added employee benefit



in the Clouds

Photo: iStockPhoto.com

for their planters to 'stay connected' during their summer planting season. JRP Solutions is taking full advantage of this increased access to the Internet by allowing customers to synchronize their planting or surveying data from any Internet connection. The servers take care of user authentication and permissions, as well as perform all the synchronization algorithms to minimize the bandwidth requirement, making the most of even a poor cell phone connection.

Small computers are everywhere. Research In Motion got the business world addicted to email and Internet access on-the-go with its BlackBerry 'smartphone'. Now smartphones come in many brands, are incredibly popular with all walks of life, and are predicted to soon be the primary way people access the Internet. For forestry, it means that forest professionals with a smartphone are now carrying the electronic equivalent of a Swiss Army Knife: computer, GPS, digital maps, camera, phone, e-mail, calculator, PDF reader, etc., and access to cloud-based programs and data. I believe this will generate a positive cycle, increasing demand for forestry software to be available on smartphones which will increase the demand for forest professionals to carry smartphones.

In between laptops and cell phones, we now have the rapid emergence of tablet computers. Dominating the market is the Apple iPad device but other manufacturers are ramping up competition in this market including Microsoft, which just released its own Windows 8 tablet named 'Surface'. There are many consumer and industrial grade tablet-style computers that have similar capabilities to the smartphones, except with much larger screens and longer battery life. Consumer grade

devices tend to be inexpensive and can usually be 'ruggedized' by adding an aftermarket case, while industrial grade hardware is relatively more expensive, but sold as fully weatherproof, shockproof devices right out of the box. Tablets are a great computing platform away from the office and will add even more incentive for software vendors to offer cloud-based software to take advantage of this new technology.

For years now, many of us have witnessed a career paradox for forest professionals. That is, they generally join the profession with the aspiration to spend time outdoors in the forest, but as information systems have become more computerized, forest professionals have become more tethered to their desks. There is a valid argument to be made in favor of computerized access to information and the use of that information to improve the speed and quality of management decisions, however, an equally valid argument can be made that more time spent in the forest also results in better decisions. I believe that the combination of cloud computing and super-portable computers will usher in a new era for forest professionals where they will have convenient access to all of their software and data even while in the forest. 🌲

Rod Poirier, RPF, is president of JRP Solutions Ltd. Rod graduated from UBC's Forest Resource Management program in 1993. He previously worked as a silviculture forester, field engineer and consulting forester. Currently Rod is working on design and deployment of multiple software programs specific to forestry. JRP Solutions currently provides forestry specific software solutions to clients in the Canada, United States and Australia.

Remote Sensing Advances for Forestry Landscape Assessment

REMOTE SENSING REMAINS AN ESSENTIAL TOOL in forestry as images captured from the air and space provide important and often unique information on the spatial patterns on the Earth's surface. Aerial photos have been acquired of the Earth's surface since early in the last century and satellite-based remote sensing began in the late 1950s. Since then, over 100 satellite-based sensors have been launched by many countries as part of national and international remote sensing programs. Remote sensing systems can be categorized as either active or passive. Passive, or optical, remote sensing systems utilize sensors which are sensitive to radiation reflected from the 400 – 2,500 nm region of the electromagnetic spectrum. Active remote sensing systems are different than passive systems in that energy is emitted from the sensor and either the return time, or amount of the energy reflected back, is measured by the sensor. The most common active remote sensing sensors are RADAR, which sends and detects microwave wavelengths of 1 mm to 1 m, and Light Detection and Ranging (LiDAR), which is a more recent active remote sensing technology using near-infrared laser pulses. LiDAR is an extremely successful technology for deriving information on tree height, canopy structure and topography and is the focus of another article in this issue.

Remote sensing is uniquely capable of synoptically covering large areas in a repeatable and cost effective manner. Data from sensors onboard these aircraft and satellites have already improved our insights into land cover and land cover change, forest growth and function, as well as allowed for delineation of anthropogenic and natural disturbances. The wide variety of satellite and airborne remote sensing imagery available to users has allowed many applications to be developed and made operational.

Broad Scale Ecoregion Assessment:

At broad spatial resolutions (pixel sizes greater than 500m) remote sensing can capture unique aspects of BC's physical environment, vegetation productivity, and available energy by acquiring and transforming satellite imagery and elevation data into landscape information. Using 1 km Moderate Resolution Imaging Spectroradiometer (MODIS) imagery, researchers at University of British Columbia and the University of Victoria have created geospatial models of annual maximum vegetation production, annual seasonal vegetation growth and spring snow cover melt (Figure 1). From analysis of latitude positions, changes in elevation, and surrounding topography they also derived models of potential solar radiation and soil moisture and integrated these layers into an ecosystem classification scheme using a robust and repeatable clustering method. The results provide BC with a consistent and continuous ecosystem modelling approach. The success of traditional ecosystem classification products such as the BC Biogeoclimatic Zones indicates the benefits of ecosystem mapping tools to support

resource management and conservation. As satellite data is readily updatable, their approach provides information for monitoring changes in vegetation production and climate seasonality. The integration of remote sensing builds upon holistic ecosystem modelling theory to include current and seasonal ecological dynamics into ecosystem classifications and provides ecological information in the under-sampled regions of BC to complement existing ecosystems maps (Figure 2).

Forest Health and Condition Assessment

At moderate spatial resolutions (10 – 500m), imagery from the Landsat series of satellites has become a critical tool in monitoring changes in the Earth's surface. During the 1980's and 90's the large cost of Landsat imagery limited its application to single scene analysis, for example, land cover map generation. However, since 2009 the entire Landsat image archive is freely available which opens access to all products from the Landsat Thematic Mapper and Enhanced Thematic Mapper sensors. This has resulted in a revolution in the type and accuracy of products derived from this sensor. Every pixel on the Earth's surface can be considered as having a "life history" captured from hundreds of images over the past 40 years. We can then use statistical tools to develop for each pixel a spectral-temporal trajectory which can indicate vegetation stability and change across large areas. Researchers at UBC, with the Canadian Forest Service, have used this newly developed capacity to map the mountain pine beetle epidemic in BC and assess time of stand death and the state of the vegetation post recovery. A suite of landscape pattern indices (such as patch size, perimeter-to-area ratios and compactness) were extracted from time series of Landsat satellite images from 1993 – 2006 (Figure 3). Using these trajectories of change the impact of the beetle infestation on forest spatial pattern is apparent with observed increases in the number of patches, an increase in forest patch shape complexity, a reduction in forest patch size, an increase in forest patch isolation and a decrease in interspersions. This information provides managers with information on how the beetle infestation has altered the landscape and can provide information on replanting strategies to mimic pre-infestation conditions.

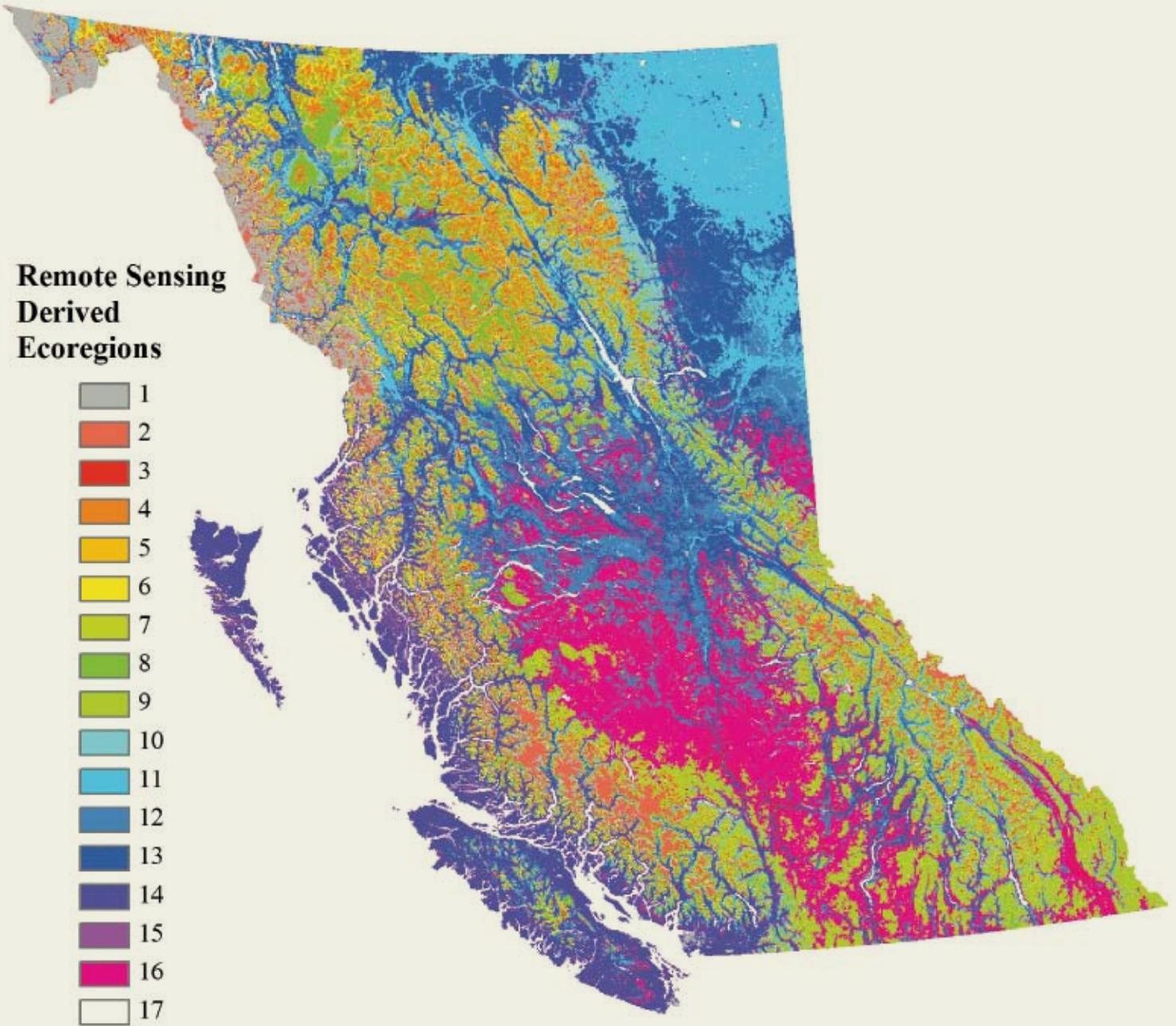
Fine Scale Detection

Recent advances in remote sensing techniques have not only focused on the temporal aspects for forestry and landscape management, but also on the availability of fine scale, sub-metre spatial resolution data such as IKONOS, Quickbird and World-view. This high spatial resolution satellite data, as well as sub-metre digital aerial imagery was, until recently, the purview of field-sampling programs and the mainstay of traditional field ecology, forestry professionals, and field managers. However, because of the recent availability of this type of data, sampling schemes can be developed which utilize these finer spatial resolution



Viewpoints

By Nicholas C. Coops, MSc, PhD
and colleagues



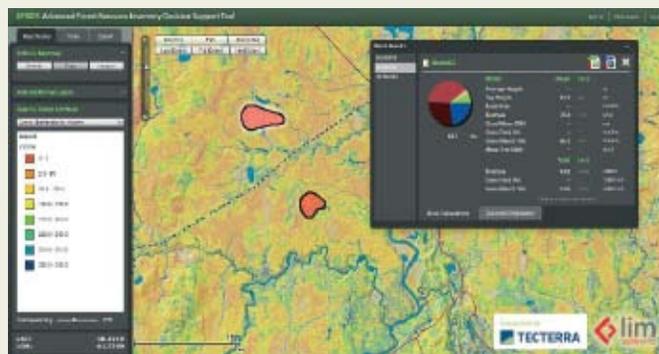
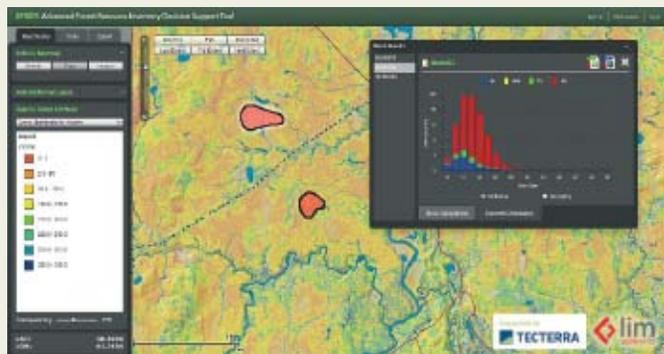
sources of data. High spatial resolution data allows the characterization of ecosystem vegetation structure and has been used to discriminate stands by species type, and by age or structural (seral) type and is particularly recommended for small ecosystems. For example, at Lost Shoe Creek and the adjacent forests on Vancouver Island, BC, high spatial resolution satellite image data has been used to discriminate vegetation structural stages in riparian and adjacent forested ecosystems. Changes in the spatial patterns of these pixels allows vegetation structural stages to be separated and then mapped over the landscape. Using the spatial pattern in addition to the spectral response observed by the satellite increases the accuracy of classifications in excess of 10% and provides

additional information that can be combined with LiDAR data to provide a comprehensive inventory of vegetation type and condition. Using this high spatial resolution data and subsequent increased accuracy allows targeted mapping of less abundant, fragmented habitats which are typically prone to being mapped with lower accuracy.

Conclusion

Remote sensing can provide significant insights into landscape pattern and process. The past decade has seen a push towards more freely

See **SENSING** continued on Page 24



Operational Implementation of LiDAR for Forest Inventory Purposes in Ontario

AN INVESTIGATION OF HOW AIRBORNE-ACQUIRED Light Detection and Ranging (LiDAR) technology could improve forest inventory information in Ontario has been an ongoing research and development program of the Canadian Wood Fibre Centre (CWFC), Queen's University, and the Ontario Ministry of Natural Resources over the past six years. This project is known as the Advanced Forest Resource Inventory Technology (AFRIT) project. AFRIT is the Ontario portion of the CWFC's national program to investigate and develop more accurate forest inventory tools to improve forest management decisions and industry competitiveness.

LiDAR is an active remote sensing technology that consists of the emission of many thousands of pulses of laser light per second. A LiDAR sensor is capable of measuring the precise time it takes for each pulse to reflect back from as many as eight objects in its path, allowing conversion of these measurements to distance or range. The accuracy of today's GPS systems allows the position of these measurements to be known in three-dimensional space, rendering a 'point cloud' of measurements of the objects encountered. When these objects include trees and the forest floor, the resulting point clouds depict forest structure.

Forest industry, along with municipal and provincial governments, have partnered on the acquisition of wall-to-wall LiDAR coverage at approximately 0.5 to 1 pulse per m² for two large boreal forest management areas in Ontario totalling 2 million hectares.

Within each of these two areas (Hearst Forest and the Romeo Malette Forest), we defined forest types that were of interest to local managers and sampled each with approximately thirty 400-m² field plots distributed through the range of development (maturity) stages present. Stand-level inventory attributes measured from these plots were regressed on selected LiDAR point-cloud statistics (e.g. canopy density metrics, skewness, kurtosis, ratios of return types, etc.) by forest type, to produce parametric and non-parametric predictive models for basal area, average tree size (height, diameter, stem volume), stems/ha, volume (gross total, gross merchantable, and sawlog proportion), above-ground biomass and tree size distribution.

The traditional parametric regression approach demonstrated significant differences in prediction models by forest type, making an inventory forest type layer prerequisite to model application. Such a layer is usually derived from manual interpretation of aerial photographs and assumes that species are distributed evenly within the labelled polygon. For mixed species polygons, this is usually a false assumption that can lead to prediction errors.

RandomForest (RF) is non-parametric technique that uses 'forests' of classification and regression trees to predict attributes. Calibrated across the same forest types as the above-mentioned parametric models, a single RF solution was implemented across all forest types, performing as good as or better than the by-forest-type implementation of parametric regression. As applied, RF did not require the prerequisite forest-type layer and permitted species heterogeneity to be dealt with directly at the 20m x 20m raster scale.

With independent validation data, both model approaches exhibited minimal bias and had coefficients of variation for predicted versus observed values that were typically about 10% for average tree size variables, and about 20% for stand volume variables. The models were then used to produce 20m x 20m predictive rasters for the forest inventory variables across each of the forests.

LiDAR-derived inventories offer an opportunity to shift from a static polygon inventory system to a raster-based architecture, permitting resource management decisions to be made unencumbered by pre-defined stand-level boundaries. However, where polygons are still needed, strong correlations between patterns in LiDAR predictive rasters, for variables such as volume, DBHq (quadratic mean diameter), and height, and independently derived photo-interpreted stands suggest that LiDAR may aid polygon generation in the inventory process. Generated in an automated fashion, such LiDAR-derived polygons could provide tentative stand boundaries for manual photo-interpretation, dramatically improving efficiencies in the photo-interpretation process and strengthening the link



Viewpoints

By Murray Woods
and colleagues

between species composition and volume or other size attributes.

To assist forest managers in working with and maximizing the decision-making power of LiDAR predictive rasters, a decision-support software system (Advanced Forest Resource Inventory Decision Support (AFRIDS) tool has been developed in partnership with Lim Geomatics (Limgeomatics.com) and the CWFC (with financial sup-

port from Tecterra (Tecterra.com)). This web/desktop-based software allows quick interrogation of the LiDAR predictive rasters, overlay of imagery and digital terrain models, harvest block creation, import, and most importantly, provide on-the-fly user-defined block calculations (with measures of variation) for predicted attributes of interest.

See **LiDAR** continued on Page 26

LiDAR Predicted Dom-CoDomht Raster

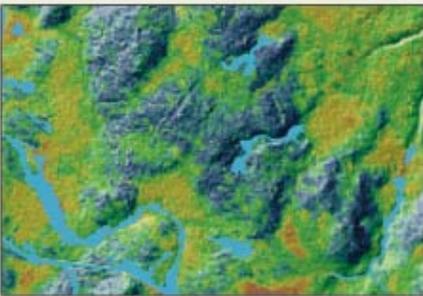
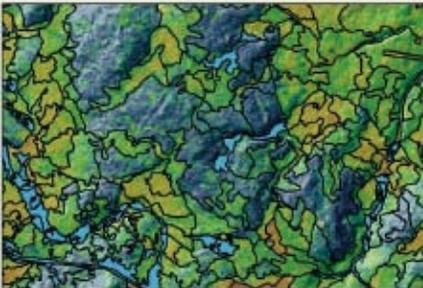


Photo Interpreted Stand Boundaries



LiDAR Predicted Dbhq Raster

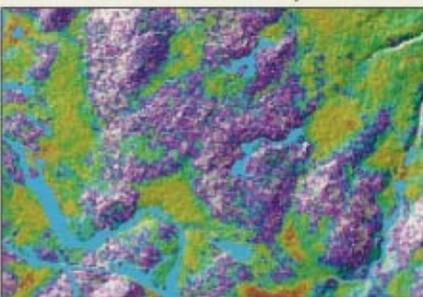
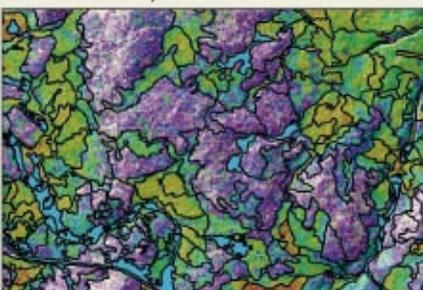


Photo Interpreted Stand Boundaries



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Timber Cruising in BC: The Sky is the Limit

HISTORICALLY, CRUISERS RECORDED THEIR CRUISE DATA ONTO CRUISE

Tally cards. Ugly weather and swarming insects were not always conducive to 'neat' hand writing. Not to mention having to flip back and forth to plot radius, age and slope correction tables in our notebooks in order to determine whether a tree was in or out and how old it was. When we finished the plot, we chained on to the next one. No matter what lay ahead, we traversed a straight line to the next sample point. These were the good old days!

Technology advanced to the point that rugged outdoor PDAs became small and reliable. It was now time for a change! In 2000, CruiseMate software was developed. This eliminated the need for hand-written cruise cards, correction tables and third-party data entry. In a few years, most cruisers in BC were using CruiseMate software. And, in 2007 we received the Northern British Columbia Business & Technology award for being Technology Provider of the year. However, with the availability of affordable sub-metre real-time GPS receivers, technology had much more to offer.

The story goes like this: a fellow cruiser dragged his chain across a road on the way to the next plot. He heard an ATV coming up the road, so he ran out to pull the chain out of harm's way. The ATV driver stopped and waited patiently. He then asked the cruiser: "What is that rope thingy for?" The cruiser explained in detail how he used it to find his way around the woods. The ATV operator chuckled, pulled out his GPS unit and asked: "haven't you ever seen one of these?" Our honour as forest professionals had now been challenged. We needed a solution.

In January 2010 we started developing a process for using GPS to locate cruise plots for appraisal purposes. We knew that the plot centre could be located accurately by setting the coordinates into a GPS unit and going directly to that point. And, we also knew that when using real-time GPS, the point position will 'drift' as the coordinates are continually updated and re-calculated. This 'drifting' presented the perception that the final plot centre location could be influenced or chosen by the cruiser.

Therefore, our goal was to create an open, transparent, auditable and repeatable procedure that meets the current ministry check-cruising standards by placing the cruise sample point as close as possible to its intended location on the cruise plan map. And, to provide the timber cruiser with a process that contributed to the 'integrity' of that sample point location. Our goal was accomplished by developing a simple procedure dubbed as TPP - True Point Position - and by programming that procedure into our CruiseMate software. This simple and easy to use application provides the

cruiser with the satisfaction of knowing that they are locating the sample point very close to its true position as presented on the Cruise Plan Map while maintaining sample point integrity.

CruiseMateGPS imports the Cruise Plan Plot Point shape file and produces a Plot Reference Point Table and displays the Cruise Plan map. From the Cruise Map on the handheld, the cruiser selects the plot to traverse to. The bearing and distance is displayed. With a compass, the cruising crew makes their way to the sample point around instead of through obstacles. CruiseMate warns the cruiser when he/she is within 15m of the cruise plan plot location. At that point, the cruiser is prompted to find a fixed reference point (small tree, rock, stump, windfall root, etc) and establish the PRP (Plot reference point). At the PRP, 50 individual GPS coords ('hits') are taken, CruiseMateGPS averages the hits and calculates the final bearing and distance from the PRP to the actual Cruise Plan Plot location. The cruiser then traverses from the PRP to the Plot Centre with loggers tape and compass and establishes the plot. All of the PRP data (e.g. PDOP, number of hits, statistics, coordinates of PRP and PC, etc) is locked into the CruiseMate Data file and stamped with the satellite time and date. When the card is created, this locked PRP data is also sent to the plot card and is printed on the card. This produces two sets of data to compare with the physical marking for verification and auditing.

To ensure that the process, software and equipment were sound, we were able to re-establish our plots well within the acceptable tolerance from the original sample point establishment over a period of weeks, regardless what direction we chose to come from.

Using GPS to establish plots also reduces the risk of injury, as the cruiser can avoid obstacles instead of having to pull a chain straight through whatever is on bearing. And, since there is no wasted time associated with conventional traversing, productivity is increased substantially.

In looking back to those good old days and at my first cruise plot as a summer student in 1976, technology has definitely made our job easier. It has also helped us to increase productivity, accuracy and safety in the ever changing environment that we work in as forest professionals. At the end of the day, cruising is the foundation of the appraisal process. Therefore, as professional cruisers we understand the importance of having the right tools, and the assurance that the data produced with the help of these tools is auditable, open and transparent. 🌲

John Armstrong, RFT, ATE, is a forestry consultant (Infinite Forestry Solutions Ltd.) with 34 years of timber cruising, auditing and training experience throughout BC. He is also a board member of the Forest Measurements Board of ABCFP. CruiseMate software was developed and written with the help of Chris Kovalcik of Emerald Computers.



Stumbling into a Forestry Career



Photo: Deb DeLong

SHE IS TWO MONTHS INTO THE NINE MONTH PROGRAM AND HARD AT work but Kat Gunion says she is enjoying the intense pace of the new course-based Master of Sustainable Forest Management program at the University of British Columbia.

Kat did what many university students do to pay for their university education—she planted trees! In 2008, she had finished a Master's in Computer Science and was about to start her PhD when an old planting buddy called up and asked her if she wanted to come and plant trees in Revelstoke. An avid snowboarder and ready for a break from university, Kat took her up on the offer. She ended up staying in Revelstoke for the next four years doing an ever increasing variety of work for a small forestry consultant.

Kat came to realize that she didn't really miss computer science—she loved working in the outdoors and living in a small town. She also started to see that her career choices would become limited without formal training in forest management. Kat completed distance education courses in forest ecology, soils and economics and then discovered that UBC would be launching its new course-based Master of Sustainable Forest Management (MSFM) program in August of 2012. Armed with her pre-requisites, she realized that this would be an efficient and integrated route towards her goal of becoming a Registered Professional Forester in BC.

The MSFM is an intensive 9-month course-based program that provides students with Bachelor's degrees in ecology, physical geography, environmental sciences or related disciplines, opportunities for advanced scholarship and professional growth in natural resource management principles and practice. Kat is one of a diverse group of 14 students from across Canada, Europe and Asia in this year's class. They

come from a range of academic and professional backgrounds including forestry, landscape architecture, engineering and biology but all share a love of the natural world and are intent on pursuing careers as professional forest land managers here and abroad. They enjoy the outdoor classes and have already been on extended field trips to the Kootenays and Vancouver Island.

Balancing the conservation and protection of forests with the production of goods and services is complex. According to program director Steve Mitchell, PhD, RPF, UBC's primary motivation for launching the program was the need for graduates who have a solid foundation in forestry related academic disciplines combined with the competencies needed by forestry professionals who can apply these to contemporary land management challenges. Master of Sustainable Forest Management graduates will be well prepared for careers in professional forest management and many of this year's class have already signed up as ASFITs with the ABCFP.

For more information about the Master of Sustainable Forest Management Program, including profiles of participants and internship possibilities, please contact the program coordinator, Deb DeLong, RPF, MSC at Deborah.delong@ubc.ca or visit www.cbm.forestry.ubc.ca. The application deadline for the 2013/14 academic year is February 28th, 2013. 🌱

Deb DeLong is the coordinator and a lecturer for the new Master of Sustainable Forest Management (MSFM) program at UBC. She has Master's degree in wood science from UBC and is a Registered Professional Forester in BC. She has worked in several capacities over the last 25 years including time as an operational forester, a researcher with FP Innovations, a consultant in the wood products industry and over a decade as a Research Silviculturist with the BC Ministry of Forests.

Interest

By Kelly Osbourne, RPF
with assistance from
Ed Korpela, RPF;
Dana Hicks, RFT; and
Lyle Gawalko, RFT



Landscape Fire Management in British Columbia

BC AND CANADA SHOW TRENDS OF INCREASING WILDFIRES WITH ASSOCIATED rising suppression costs and threats to communities and infrastructure. The effects of climate change are driving this trend, in addition to other factors such as the new mountain pine beetle fuel type, increasing community wildland urban interface, critical infrastructure and natural resource development on the forested landbase. A predicted increase of 4°C in mean annual temperature by 2080 (Haughian, S. et al, 2012) as a result of climate change suggests significant future impacts including: increased fire size, fire severity, fire season length and severe fire behaviour along with a decrease in extent of fire free areas. Also, dead mountain pine beetle pine stands have created a new fuel type estimated to be increasing at a rate of 808,327 ha annually (Hvenegaard, S., 2012). Fire behaviour changes associated with this fuel type include rapid crown fire initiation, high intensity fires and mass spotting, and associated fire control suppression challenges. (Perrakis, D., et al, 2012).

Historically, wildfires have always played an important role in the evolution of terrestrial landscapes across BC; however, by effectively removing wildfires from forests to meet resource management objectives, forest ecosystems in many areas have exceeded natural disturbance intervals resulting in decreased forest health and increased hazardous forest fuels conditions. Recent history has shown that along with increased threats to communities and critical infrastructure, threats to resource values are also increasing. Over the 2004, 2009, and 2010 seasons, wildfires affected 414,000 forested hectares with 340,000 hectares being in the timber harvesting land base (FLNRO, 2011). This represents an estimated 51 million cubic metres of timber volume.

An innovative approach is required to meet the upcoming challenges around forest and wildfire management. Landscape fire planning and management (LFPM) aims to create a more fire resilient landscape that will mitigate fire impacts on priority values in an era of increasing fire hazards and risks. LFPM extends fire management initiatives from the Wildland Urban Interface of municipal lands adjacent to communities, to provincial forests to further mitigate impacts to communities, critical infrastructure, cultural and natural resource values (values at risk). The government of British Columbia has recognized the value of proactively reducing wildfire risks/threats. Wildland Urban Interface (WUI) fuel reduction and landscape fire management are recognized as key objectives in the BC Forest Sector Strategy, the BC Forest Stewardship Action Plan for Climate Change, and more recently in the recommendations of the report of the Mid-Term Timber Supply Review Committee.

LFPM provides an opportunity to coordinate a wide array of management actions from ecological restoration (ER) to the use of modified response fires, modified stocking standards, species composition and other silviculture or harvest treatments to mitigate impacts to communities, and other values at risk. This can be accomplished by: modelling current and predicted wildfire risk and threat probability over the next 20 years; analysing fire related impacts of land management options; and creating landscape level fuel breaks through targeted harvesting, establishing linear fuel breaks, and utilizing alternative silviculture practices.

LFPM allows forest and other qualified professionals to plan for and identify where fire is either beneficial or detrimental to values on the landscape. These areas can then be prioritized for management through ecological restoration and/or prescribed fire or, where appropriate, through natural fire. By proactively managing the landscape to create more fire resilient landscapes, BC can mitigate the increased risks and impacts to communities and natural resource values. The result will be fire adapted communities, and fire-resilient ecosystems over the long term. This integration of wildfire suppression activities, the identification and prioritization of values (infrastructure, SAR habitat, watersheds etc.), and proactive practices and fuel treatments on the land base in the context of fire ecology and behaviour will be a bold step forward for forest management in BC.

The successful and more deliberate integration of wildfire considerations into resource management planning in BC will also require a focused commitment by forest professionals, all industries, communities and agencies. Recognizing fire as part of the ecological process and a major driver on the landscape is critical for professional resource management activities and resource investment decisions.

A technical session on LFPM in BC will held Wednesday, February 20th, from 1:00 to 4:00pm at the February ABCFP AGM, which will involve a more detailed presentation and discussions with participants focusing on the requirements to move this initiative forward. Topics include:

1. What are the barriers and proposed solutions within forest practices policy and legislation;
2. How can fire management considerations be incorporated into all land management decisions? (And, perhaps conversely, how can land management decisions form part of fire response and management?)
3. What is required to support professional, industry, stakeholder, and community participation in landscape fire planning and management?
4. Do we bring together tenures and fuel management ? If so, how might this be achieved?
5. What is the role of professional reliance in landscape fire planning and fuel management?
6. What competencies are required of professionals who provide advice in fire and fuel management?

Be part of this important proactive approach to land and fire management and complement your annual professional development. www.abcfp.ca/conference. 🐾

Kelly Osbourne is currently the Fire Management Planning Forester with Wildfire Management Branch in Victoria, BC. Previous to that, Kelly was the Forest Rehabilitation Planning Specialist with Resource Practices Branch, a Practices Forester with BCTS in Haida Gwaii, and a Silviculturalist with Tembec in Fernie. She is a RPF, with a BSF from UBC, and a Diploma in Forest Technology from BCIT. In her spare time, Kelly likes backcountry skiing and climbing mountains all over BC and the Rockies in addition to hanging out at home with her two dogs, Boomer and Sitka.



Learning Leadership: The Role of a Forest Professional in the Industry

OVER THE LAST 20 YEARS, SIGNIFICANT REGULATORY CHANGES HAVE put more reliance on forest professionals and less on prescriptive regulations. However, I believe we are missing effective leadership and leadership training within the practice of professional forestry to successfully work within this change.

Daniel H. Pink is author of four provocative books about the changing world of work. He has an excellent YouTube video, “Dan Pink on Motivation, Performance and Challenging Business Orthodoxies,” where he talks about the science of performance. Counterintuitively, he argues that performance is not based on money. He shows that we perform much better in an environment where we have:

1. Autonomy
2. Mastery
3. Purpose

Clearly, a highly regulated and prescriptive environment, such as the one created by the *Forest Practices Code*, doesn't provide for autonomy. Under the Code, far too much energy went into mastering the bureaucratic process rather the practice of forestry. This situation hardly gave forest professionals a sense of purpose.

The *Forest and Range Practices Act* (FRPA) was supposed to solve these problems and create more opportunities to innovate. Since forest professionals wouldn't be bogged down in the bureaucracy of the *Forest Practices Code*, they would have more time to master their practice. And their more involved role in the practice of forestry would increase their sense of purpose. Sounds like a good compliment to professional reliance doesn't it? But have the changes made for a better professional reliance environment? If not, what is missing?

First I would like clarify what I mean by effective leadership and professional reliance before I explain the importance of the relationship.

Effective Leadership

When I discuss effective leadership, I am not talking about positional power. I am definitely not talking about dominant individuals who bully their way through life. I am talking about individuals who motivate people well. They value employees, coworkers, stakeholders and the public. They provide environments where individuals have autonomy, mastery and purpose. Leaders provide clear goals and outcomes but they don't tell you how to get there. They know when to step in to provide coaching. A leader is self-aware and able to build effective relationships.

Professional Reliance

Definition of Professional Reliance, published in September 2004, describes professional reliance as “actively engaging in dialogue with interested parties to build trust and understanding.” *Applying*

Professional Reliance under FRPA, published in April 2008, talks about trust and confidence. *Standards of Professional Practice: Guidelines for Interpretation*, published in January 2010, describes professional reliance as an attitude or approach and guarantees of service. Most professional reliance documents talk about respectful interaction; respectful dialogue is supposed to be our first approach.

The Relationship

The more reading I do or workshops I attend on leadership, the more I see a strong connection to professional reliance. Isn't professional practice about autonomy, mastery and purpose? For example, our right to practise professional forestry (autonomy) and our obligation to high standards and continuing education (mastery) is another example.

Self-awareness is critical in the practise of forestry. What are our strengths and weaknesses? Self-awareness is also the key to effective leadership. Do we have the training to know where we focus our attention (extraversion versus introversion), the way we take in information (sensing versus intuition), the way we make decisions (thinking versus feeling) and the way we deal with the outer world (judging versus perceiving)? There is not a right or wrong; but there are strengths and weakness. We need to understand what they are.

A big key to professional reliance is good communication and trust. I would want to be able to ask good questions and develop strong listening skills. You cannot build trust without a relationship. Ask yourself before your communication:

1. Has a relationship of trust already been well established?
2. Is one of us likely to be upset by the conversation?
3. How can I stand up for my rights without impacting their rights?

It is about taking your communication skills to another level. For example, asking good questions is a learned skill. I personally find asking good questions is difficult and requires practice. Questions are commonly asked as leading questions. It suggests we have already made up our mind and are just trying to get that confirmation. Hardly the way to build trust, but we so often do it.

Just as forestry is a life-long journey in learning so are leadership skills. I think it is the complement to professional reliance that we have been missing. It will help to create the environment for that will give us autonomy, mastery and purpose. We can still have that environment that encourages innovation. 🐾

Greg Yeomans, RPF, graduated from UBC in 1985. He worked on the coast consulting and with Western Forest Products until 1993 when he started with Canadian Forest Products. He has been working with them in the Interior supervising and coordinating silviculture, harvesting, road construction, layout, permitting and planning. His current role is planning coordinator for their western operations in Houston and Vanderhoof.



North Island wins Battle of the NFPs



CONGRATULATIONS TO THE NORTH ISLAND NETWORK OF FOREST PROFESSIONALS who have won the 2012 Battle of the NFPs! The Battle was very close this year and North Island just edged out the East Kootenay NFP for the win. North Island reached almost 800 students from 13 schools and several home-schooled families.

- Grade 8 and 10 Planning students received presentations on careers in forestry, which included the opportunity to discuss forestry with a couple of passionate forest professionals.
- Over 450 primary-level students received presentations on predator education, which included a visit from Smokey Bear, some hands-on time with various predator pelts and skulls, and handouts.
- Over 220 intermediate-level students participated in full-day forest tours, in the vicinity of Marble River. The forest tours were held over two days, and included a

hike along an interactive forest trail, an opportunity to plant trees, a mini-logger sports competition and a salmon BBQ lunch.

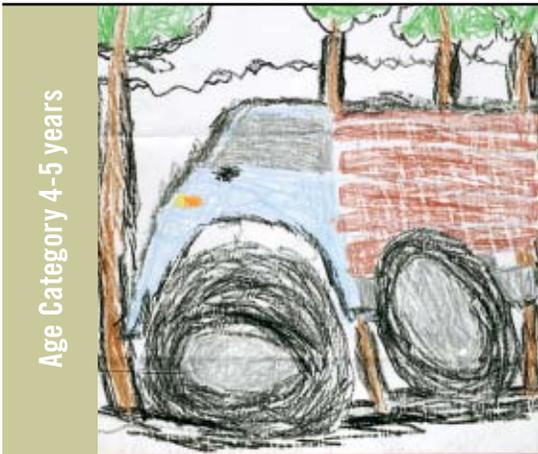
- The students at Woss School were treated to their own forest tour by local Western Forest Products staff, which included a hike along an interactive forest trail, an opportunity to plant trees and pick cones, some fun activities and a BBQ lunch.
- In addition, 100 members of the public attended two bug-themed events in honour of National Forest Week.

These activities were made possible by 65 volunteers from 10 organizations. The East Kootenay NFP reached over 375 students in four schools. They planned a fun day of forest-related activities for the students including fire-fighting and visits with Smokey Bear. 🐻

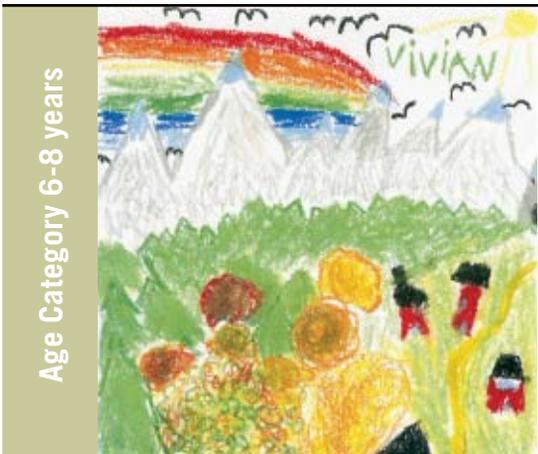
National Forest Week Celebrations

More than 600 children put on their artist hats and created pictures that demonstrated what the forest meant to them. Entries included paintings, oil pastels, crayons, pencil crayons and paper piecing. Nine children emerged as winners and runner ups of the National Forest Week contest held by the ABCFP and the Truck Loggers Association (TLA).

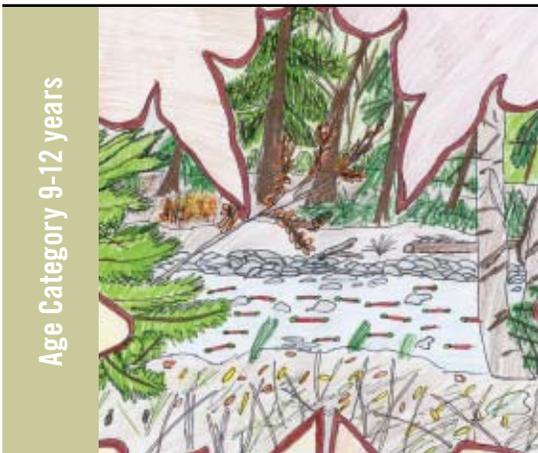
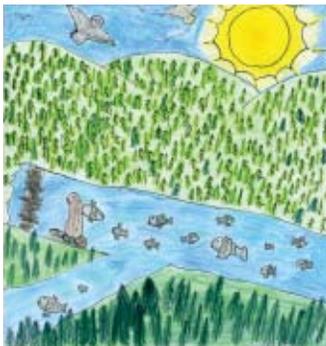
Each category had a winner and two runners up. Each winner received a \$50 gift card to Chapters and all the kids received a certificate of achievement. Thank you to everyone who took the time to submit a drawing. Picking the winner was very difficult—so many of the submissions were outstanding.



Winner - Jack Copley, age 5 of Lac La Hache
 Runner Up - Giselle Breton, age 5, of Victoria
 Runner Up - Alexandra Heywood, age 5, of North Vancouver



Winner - Vivian Thomas, age 6 of Smithers
 Runner Up - Sara Laderas, age 8 of Vancouver
 Runner Up - Zoë Barak, age 8 of Vancouver



Winner - Evan Smith, age 11 of Salmon Arm
 Runner Up - Nick Sakiyama, age 11 of Revelstoke
 Runner Up - Ayla Roche, age 12 of Revelstoke



The 2012 Registration Exam: Building a Forest Professional Workforce

CONGRATULATIONS TO EVERYONE WHO WROTE AND PASSED THE 2012 registration exams!

The sit-down exams were held on Friday October 4, 2012, in 27 locations throughout BC. A total of 58 people wrote the sit-down registration exams – 15 RFT candidates and 42 RPF candidates. One RFT candidate wrote the special registration exam on November 16. A further 57 RPF candidates wrote the RPF take-home exam in January and February of 2012.

This year we have two excellent valedictorians who achieved the highest marks on their respective exams. The highest mark on the 2012 RFT registration exam was earned by Megan Louise Genevieve Tandy, TFT, of Prince George who scored 86%. The top mark on the RPF registration exam was 87% and was scored by Melissa Lauren Kirk, RPF, of Black Creek. Congratulations to this year's valedictorians!

The names of the 2012 successful examinees are available on page 23. Congratulations to these successful exam writers. These new RPFs and RFTs will be welcomed into the profession at the Inductees' Luncheon at Forestry: The Future is Growing, the ABCFP's annual conference and 65th AGM. This year, the conference is being held in Prince George from February 20-22, 2013.

Registration Exam Statistics

2012 RFT Exam

A total of 15 candidates wrote the RFT registration exams in October and all of those candidates passed the exam. There were nine candidates who wrote the RFT exam in the new format, five people wrote only the part B exam and one candidate wrote Part A only. This year one candidate wrote and passed the RFT Part B special exam that is available in November for those candidates who cannot make the October exam date due to circumstances beyond their control.

RFT Registration Exam Results					
	RFT	# of Writers	Average	2012 Pass	2011 Pass
	Part A Only	1	60%	100%	n/a
	Part B Only	6	74%	100%	50%
	New Format	9	75%	100%	100%
	Overall	16		100%	85%

2012 RPF Exam

The take-home exam has become a mandatory requirement for all candidates pursuing the RPF designation. Applicants must achieve a mark of at least 60% on each of these exams in order to pass. The overall pass rate for both the RPF exams (take-home and sit-down) in 2012 was 79%. Of the 99 sit-down and take-home exams that were marked, 78 passed and 21 failed. The pass rate for the 57 candidates who wrote the take-home exam in January and February 2012 was 81% (46 candidates passed and 11 failed). The pass rate for the 42 candidates who wrote the sit-down exam in October 2012 was 76% (32 candidates passed and 10 failed). This year no one applied for or wrote the RPF special exam that is available in November for those candidates who cannot make the October exam date due to circumstances beyond their control.

RPF Registration Exam Results					
	RPF	# of Writers	Average	2012 Pass	2011 Pass
	SIT-DOWN EXAM	42	65.4%	76%	83%
	TAKE-HOME EXAM	57	64.6%	81%	66%
	OVERALL	99		79%	76%

On behalf of the ABCFP and the profession, I would like to express our gratitude, and a huge thank you for a job well done to all of the volunteers and staff who have worked so hard to ensure that the exam process is conducted in a fair and efficient manner. 🌲

David Douglas: A Naturalist at Work

Jack Nisbet
2012, 191pp, illustr.
Sasquatch Books, Seattle, WA
ISBN-13:978-1-57061-829-1

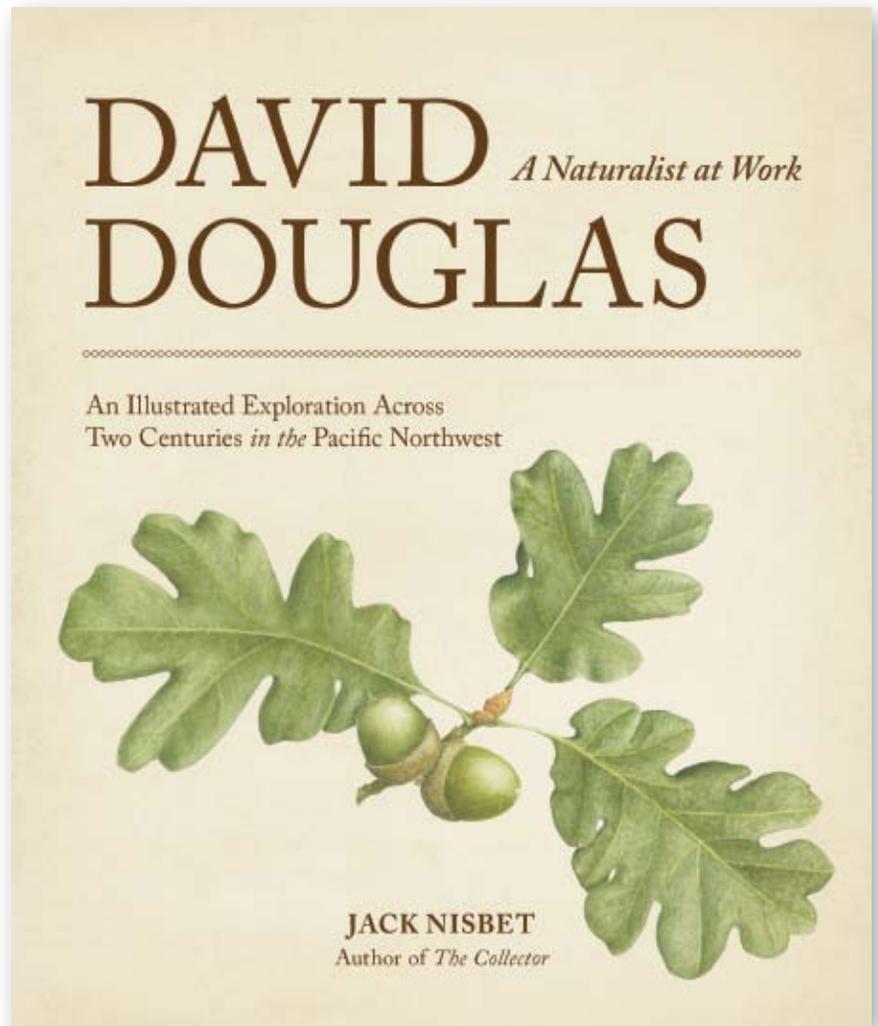
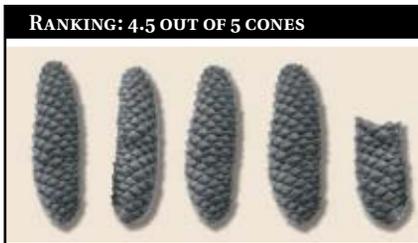
This is not another chronological account of Douglas' exploratory journeys—there are already five such books. Rather, it is a very readable and handsomely illustrated set of ten essays each focussed on one particular aspect of his travels in the Pacific Northwest, interspersed with the author's current experiences in the same locales.

This novel approach to storytelling about the remarkable David Douglas fleshes out the image developed in previous books and gives a fuller picture of the breadth of his interests. Here readers learn that Douglas was something of an anthropologist, observant natural historian and taxidermist, had an understanding of the basis of ecology and geological processes; not a bad record for someone who often skipped school in his early years!

A prologue introduces both Douglas and Nisbet showing their attention to detail and outlining Douglas' mandate. The successive essays discuss past and present maritime challenges to entering the Columbia river mouth at Astoria; Douglas' dealings with resident natives and wise use of their knowledge and expertise; a first venture to the Interior; his welcome and invaluable support by Hudson Bay Company staff; the complex social relations of fur traders with natives; his return to London and reception there; his examination and classification of oaks and many conifers; demonstration of his skills as a naturalist beyond botany; and, lastly, his studious and successful acquisition of ability as surveyor.

Nisbet's book is a valuable complement to the corpus of Douglas literature but it has a few minor flaws. Sentences without verbs are unacceptable in serious writings and the wording in one or two places strives for effect rather than accuracy. Probably only a Scot will know that "Auld Reekie" refers to just Edinburgh and not Scotland, and that the bibliography omits Archie Smith's short, 1997 booklet "All for a Handful of Seed: the Life and Adventures of David Douglas." These are not damaging shortcomings and I'm happy to add the book to my collection. 🌱

Reviewed by Roy Strang, PhD, RPF(Ret)



SENSING continued from Page 13

available and high end remote sensing products, such as land cover and other biophysical datasets. In addition, the widespread adoption of LiDAR and other technologies offers advances that will be of interest to many forestry professionals across Canada. 🌱

Nicholas Coops is a Canada Research Chair (CRC) in Remote Sensing and leads the Integrated Remote Sensing Studio (IRSS) at UBC which has MSc, PhD and postdoc's undertaking a range of multidisciplinary projects. Nicholas has been at UBC since 2004, prior to which he worked at the CSIRO in Australia. Nicholas' interests include utilizing remote sensing for a wide range of environmental applications, such as the application of broad scale satellite imagery for regional biodiversity assessment, LiDAR data for both urban and forestry applications and forest growth and carbon modeling. Nicholas has published over 200 refereed journal papers and enjoys discussing the use of remote sensing to anyone who will listen. Please feel free to contact Nicholas at Nicholas.coops@ubc.ca

Attendants on the Journey of Good Forest Stewardship

“steward ... 1 a passengers’ attendant on a ship or aircraft or train. ...”

The Concise Oxford Dictionary

The Foresters Act AND THE ABCFP’S CODE OF ETHICS ARE REplete WITH references to “forest stewardship.” Under section 4 of the Act, one object of the ABCFP is to “advocate and uphold principles of stewardship.” Under the Code of Ethics, members have a responsibility to the public “to advocate and practice good stewardship of forest land.” The Act goes so far as to define conduct unbecoming a member to include conduct that “undermines the principles of stewardship that are the foundation of the practice of professional forestry.” All of this begs the question: What are these foundational principles of good forest stewardship?

One might pass the buck and suggest that principles of good forest stewardship are whatever the association’s council says they are given that that council is empowered under section 11 of the Act to pass resolutions for “the promotion of good forest stewardship.” This is a cop out—surely the profession’s foundational principles are not something that successive councils can tinker with from time to time through passage of mere resolutions (or even bylaws!). Besides, the Act speaks to council’s ability to pass resolutions for the promotion of good forest stewardship, not for the definition of good forest stewardship.

‘Good forest stewardship’ is one of those phrases that takes substantive content from the individual or group who uses the phrase at any particular time. In other words, substantively good forest stewardship (that is, what actually happens on a given piece of forest land) can mean different things to different people. To some it might mean planning a timber harvesting operation for a given site in a manner that minimizes soil disturbance and that otherwise ensures the regeneration of a healthy forest. For others, good forest stewardship might mean that the same site is reserved from timber harvesting altogether to minimize disruption of habitat for some endangered species. Substantive good forest stewardship would include, for some, timber harvesting activities on a site that, for others, it could not.

Good forest stewardship must take meaning from something other than on-the-ground forestry outcomes since reasonable people can so easily disagree on what constitutes good on-the-ground forestry outcomes in any given case based upon their own personal, subjective values. It must mean something other than what is in the eye of the beholder. Forest professionals can take guidance in this regard from the duties of the association. The first duty of the association under the Act is to “serve and protect the public interest.” The first responsibility of a member in the Code of Ethics is to the public.

Clearly, the question of what is in the public interest is equally as confounding as the question of what is good forest stewardship in the

sense that there is a diverse public with a diversity of interests. But it gives direction in terms of the principles of good forest stewardship: principles of good forest stewardship promote the public’s interest in forestry management decisions. This suggests that the principles of good forest stewardship are part of a process, not merely substantive forestry outcomes. It is the process of translating the public interest in terms of on-the-ground forest management decisions.

The public interest is principally determined through our sovereign legislatures. However, implementation of sovereign determinations of the public interest often requires arbitration among competing thoughts about those sovereign determinations—in other words, it requires the exercise of judgment. Even with sovereign determination of the public interest, the exercise of judgment necessary to execute upon those sovereign determinations can become hugely complicated: that’s why we have forestry professionals. Principles of good forest stewardship relate to the use of knowledge, methodologies and procedures that forest professionals accumulate through their specialized education, training and experience. They guide the use of this specialized knowledge, training and experience in a manner that allows forest professionals to exercise the judgment necessary to make decisions with respect to the implementation of the public interest in any given instance. 🌲

Jeff Waatainen is an adjunct professor of law at UBC, has practised law in the forest sector for over fifteen years, and currently works in the Forestry Law Practice Group of Davis LLP’s Vancouver offices.

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LiDAR continued from Page 15

LiDAR predictive rasters, particularly when used within AFRIDS, have proven highly useful for forest management decision-making. For example, we have observed large increases in the efficiencies of forest operations through better planning and the optimal selection of harvesting equipment and allocation of raw materials to mill facilities. A retrospective cost-benefit analysis was conducted by FPInnovations on one of the forest management area's annual harvest schedules to quantify the savings associated with the use of these LiDAR-derived inventory supplements. The real costs of more than 30 activities related to inventory acquisition and processing, forest operations and mill processing, using a traditional inventory, were compared to those using the traditional inventory plus the LiDAR predictive rasters. Some of the largest cost savings associated with the enhanced inventory information were observed to come from modifications to harvest block design and road construction, and substantially reduced differences between actual and expected harvest volumes. This study, unique to boreal Ontario, indicated that a LiDAR-enhanced inventory can improve decision making and result in overall cost savings of \$1.60/m³ in planning and operational aspects of forest operations. It was estimated that LiDAR acquisition and implementation costs may be recovered in less than two years.

LiDAR's ability to add value to existing inventories has been demonstrated operationally in Ontario. Tembec continues to acquire additional LiDAR coverage of its forests, even during these tough economic times for the forest industry, in order to help in make more informed decisions. Many other jurisdictions and agencies across Canada are also evaluating the role that LiDAR can contribute to forest inventories.

For more information, contact:

Murray Woods (murray.woods@ontario.ca), or
Doug Pitt (dpitt@NRCan.gc.ca)

Murray E. Woods, Senior Analyst, Ontario Ministry of Natural Resources. Associate member of the Ontario Professional Foresters Association. Murray began his career with the Ontario provincial government in forest growth and yield research. He has authored and contributed to numerous publications focused on tree, stand and forest level modelling. Most recently, Murray has been working on the operational implementation of remote sensing technologies to improve and increase the information content of natural resource inventories.

Douglas G. Pitt, PhD, Research Scientist, Canadian Forest Service – Canadian Wood Fibre Centre, Sault Ste. Marie, ON. He has contributed to a variety of quantitative silvicultural research projects across Canada – this work ending up in more than 50 scientific articles and hundreds of presentations at conferences and workshops. Ultimately, Doug strives to provide forest professionals with practical tools for crop establishment, stand tending, and remote sensing applications in forest sampling.

Margaret Penner, PhD, Consultant, Forest Analysis Ltd. H Margaret started as a research scientist with the Canadian Forest Service. Since the closure of Petawawa National Forestry Institute in 1995 she has been providing consulting services in the areas of growth and yield modelling and forest inventory across Canada.



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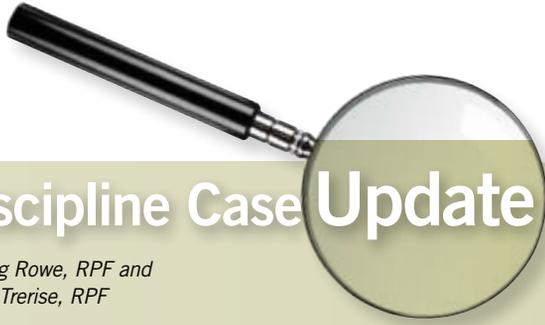
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Discipline Case Update

By Greg Rowe, RPF and
Randy Terise, RPF

Our discipline process has been quite busy in the last few years. Recent complaints are split almost evenly between complaints from the public and complaints from members. A number of the complaints involve important considerations that should be part of member's continuing education. Detailed case digests for the completed cases are available on our website under the Regulating the Profession/Complaint and Discipline/Discipline Case Digests tabs. What follows is a brief outline of some of the issues of concern from recent complaints of which members should be aware.

Relationships with Other Members –

Professional Disagreements and Differences of Opinion

Members should be familiar with standards of professional conduct with respect to how they apply to interactions with other members. This is governed by bylaw 11.6.1 (abstain from undignified public communications with another member) and Bylaw 11.6.2 (not to unfairly criticize the work of other members or attempt to injure the professional reputation or business of another member).

It is also important to understand that the ABCFP complaint process is intended to resolve complaints specifically relating to the *Forester's Act* and ABCFP bylaws. In the normal course of professional practice disagreements will likely arise between members from time to time. While these disagreements can be difficult for those involved, it is important to remember that these disagreements should only be dealt with through the ABCFP complaint resolution process if they meet the four tests of the *Forester's Act*. If they do not involve contravention of the Act or ABCFP bylaws they are properly dealt with through other mechanisms such as the non-discipline professional accountability process that is described on our website. While it can be difficult to distinguish between bylaw contraventions and differences of professional opinion in some cases (and the Complaints Resolution Committee assists the Registrar with this) a thorough reading and understanding of the ABCFP Code of Ethics – Guidelines for Interpretation will likely be helpful, as will reviewing the Discipline Case Digests.

Relationships With Other Members –

How to Criticize Other Members in an Acceptable Fashion

This is governed by bylaw 11.6.1 (abstain from undignified public communications with another member) and Bylaw 11.6.2 (not to unfairly criticize the work of other members or attempt to injure the professional reputation or business of another member). It is important to understand what is acceptable in terms of both public and private communication. This includes form of communication, timing, and whom it is copied to.

In these cases it is important to stick to the facts and ensure that criticism is fair. To be fair, criticism must be honest, accurate, and tactful. (ABCFP Code of Ethics – Guidelines for Interpretation, March 2009). Criticism should adhere to the facts and avoid any unnecessary judgments about another member's competence. Also the circulation of the criticism should be kept to the minimum necessary to accomplish the objective.

Members' Stewardship Obligations Versus Government Rights

ABCFP members have a responsibility to practise good stewardship of forest land. This is specified in Bylaw 11.3.1 (To advocate and practice good stewardship of forest land based on sound ecological principles to sustain its ability to provide those values that have been assigned by society). ABCFP members also have an obligation to consider non-legal elements (for instance a LRMP that has not been given legal status) when making resource use decisions. Government retains the right to set objectives and to decide what is protected.

As ABCFP members we need to understand the distinction between our stewardship obligations and government authority to set provincial policy regarding endangered species or ecosystems (e.g. government sets the objectives, we ensure logging meets the objectives). When considering non-legal elements members should be guided by Bylaw 11.3.3: "...and to seek to balance the health and sustainability of forests, forest lands, forest resources and forest ecosystems with the needs of those who derive benefits from, rely on, have ownership of, have rights to and interact with them." We also need to be able to communicate this distinction clearly to a variety of audiences. Changes to Road Locations and Road Building Techniques Prescribed by a Geotechnical Professional

Changes to Road Locations and

Road Building Techniques Prescribed by a Geotechnical Professional

Members should understand their responsibilities with respect to management of terrain stability and the use of qualified geotechnical professionals. When operating on unstable or potentially unstable terrain and a qualified geotechnical professional has made a recommendation regarding road location or road construction techniques, all changes to the location or construction techniques on that section of the road should be approved by a qualified geotechnical professional. While the ABCFP member may not be on site during construction, good practice would require it to be made clear to the road construction contractor that on unstable or potentially unstable terrain no changes are to be made unless approved by the ABCFP member. The forest professional must decide whether a change requested by the road building contractor can go ahead immediately or whether a geotechnical professional trained to assess terrain stability must approve the change.

If you'd like to read more detailed case digests for the completed cases, visit the ABCFP website at www.abcfp.ca and click on Regulating the Profession, Complaint and Discipline and then Discipline Case Digests.

Membership Statistics

ABC FP—October 2012

NEW RFT

Jordan Duncan Carter, RFT
Shauna Carmen Cryer, RFT
Andrea Marie Jancicka, RFT
Codie Corrine Johnston, RFT
Heidi Jean Muller, RFT

NEW RFP

Bharat Adhikari, RPF
Yann Rene Andre Bourdon, RPF
Matthew Joseph Brown, RPF
Kenneth Earl Byrne, RPF
Daniel Nicholas Doubinin, RPF
Erika Marie Michele Doyon, RPF
Sarah Michelle Eggers, RPF
Derek Lee Holtom, RPF
Shannon Lee Irvine, RPF
Melissa Lauren Kirk, RPF
Noah Raymond Lucas, RPF
Shawn R. Mandula, RPF
Andrew Bruce McCuaig, RPF
John Andrew McLeod, RPF

Craig Robert Nitschke, RPF
Tammy Sue Marie Rancourt, RPF
Brent Jack Thiessen, RPF
Martin Anthony Watts, RPF
Krista-Bay Lisa West, RPF

NEW ENROLLED MEMBERS

J. Patrick Arbour-Nevins, FIT
Clayton Bradley Beier, FIT
Jordan Arthur De Graaf, TFT
Ye Huang, FIT
Matthew Melvin Lebron, FIT
Travis Reid Mitchell, TFT
Nicholas John Niddrie, FIT
Jeffrey Douglas Reyden, FIT

NEW RETIRED MEMEBERS

Carlos G. Ackerknecht, RPF(Ret)
Andrew A. Amanovich, RPF(Ret)
Henning B. Larsen, RPF(Ret)

REINSTATEMENTS

Alan Herman Glencross, RFT
Shawn M. Meisner, RPF
Denis Pelletier, RPF
Lindsay Alison Vandesteeg, RPF

DECEASED

Leslie F. Renshaw, RPF(Ret)
Arthur W. Weston, RPF(Ret)

The following people are not entitled to practise professional forestry in BC:

RESIGNATIONS

Michelle Ruth Cleary
James Allan Eunson
Franz Reuter

Pencils to iPads continued from Page 6

was his development of the fire-fighting tool that carries his name, the pulaski. (Timothy Egan's 'The Big Burn' provides a good read of the events and impacts surrounding the fires of 1910.)

As a summer student, and during the early days of my career, I spent a lot of time in the field. My tools included a compass, clinometer, barometer/altimeter, increment borer, measuring chain, prisms for timber cruising, notebook with water-proof paper, a couple of good pencils etc. We also used aerial photos along with a stereoscope. In the office there would be supplies for drafting and plotting field work.

The computer evolution advanced and it didn't take long to move from expensive, centrally located computers to the laptops and tablets so commonly used today. In addition to

the computer's obvious ability to handle data, make calculations, plot maps and more, we now have the ability to quickly retrieve, use and manage tremendous amounts of data. In addition, we can model, make assumptions, test and compare the potential impacts of making certain decisions. Consider timber supply analysis for example – where scenarios or sensitivities can be tested to estimate the effects of change such as harvest age, different growth models and various harvest constraints.

Global Positioning System (GPS) has enabled us to locate and relocate specific areas lending ease and accuracy to daily work. GPS, along with the Geographic Information Systems means that quality computerized mapping, not drafting tools and pencil crayons, is at our finger tips.

Organizing and combining our collective knowledge into the development of best management practices and standard operating procedures has resulted in more consistent and improved approaches to the way we do work. And even more importantly, worker safety has improved through utilization of safety procedures, communication advances, safer equipment and personal protective equipment.

I know there are many other areas where new technology applies to various aspects of forestry be it harvest equipment, forest research or reporting and record keeping. With the development of new technology, we are provided an opportunity to advance the way we practise forestry. Used properly, these evolving changes in technology can significantly enhance our ability to better manage forests! 🌲

In Memorium

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 member:

Daniel Alexander

RPF #1041

1952-2012



I first met Dan when he was a forestry summer student, obviously just hired for the summer at our mill. He was so effective working for us that first summer that we hired him again for the next summer. We were all impressed by his good humour and work ethic. Luckily for us, we managed to hire him full time when he finished his forestry degree at UBC.

For someone so young, he was extremely competent. It was not long before he was running the forestry side of our operation. He was a good manager—never too demanding of his crew, but always getting the job done in a timely and efficient manner.

He worked with us for about 20 years until we sold our operation to Northwood.

At that time, he became the plant manager and then president of Rustad Bros. for Northwood. When Northwood was sold to Canfor, Dan moved on to Weldwood, here in Quesnel, as the plant manager of the plywood plant. When Weldwood was sold, Dan went to BC Forestry Innovation Investment. There he analyzed and made recommendations on proposals for mountain pine beetle projects. His most current position here in Quesnel was as the general manager of the Canfor Quesnel Division.

Dan was a professional forester in the best sense of the word 'professional.' He cared about the forest as a whole and not just as a way to make a living. He was also always able to find solutions. One of Dan's big jobs at Rustad Bros. was to buy private timber or properties with timber on them. Our annual allowable cut was only half of what we needed to keep our sawmill running so he was always looking at how we could add to that timber volume. Dan once arranged the purchase of logs in Saskatchewan that he brought to the mill as a backhaul on trucks hauling lumber to Edmonton. He also set up a rail loading site in Fort Nelson so we could bring logs out of the Yukon by truck and then reload onto railcars for shipping to Prince George. This worked effectively for several years.

While working in the forest industry he became involved with the Northern Interior Lumber Sector of the Council of Forest Industries and took on many important positions and responsibilities including that of chairman. The lumber industry, as well as all his friends and fellow workers, are the losers now that Dan is no longer with us. He has made a remarkable contribution to our industry and will be sadly missed by his colleagues.

The things that made Dan a good manager also meant that in his private life he was an organized, kind and caring husband, father and grandfather. Dan is survived by his loving wife, Sue; his children, Bruce (Katie) and Erin (Tavish); and his grandchildren, Avery and Josh. I know he enjoyed being a father and, although it was cut short, he was making the most of being a grandfather too.

Dan was a remarkable young man when he joined Rustad Bros. almost 40 years ago and grew to be a good manager because he was a good man. He was innovative. He was always fair. And he cared for his people. Without a doubt, he cared about his family most of all.

And while it's unfair that Dan left us so early, he certainly lived a good life. He was a smart, kind, caring man, and we are all better off because of the part Dan played in each of our lives.

Submitted by Jim Rustad

A Moment in Forestry

Submit your moment in forestry to Doris Sun at: editor@abcfp.ca



Mighty Wet Submitted by Berry Wijdeven

The forests are mighty wet this time of year but also pretty gorgeous. This is a tributary of the Mamin River on Graham Island, Haida Gwaii.

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All of these sessions and events are included in your \$375 conference fee – just register before the January 21st early bird deadline to take advantage of this great price. For an additional \$50, you can select two technical workshops that will be held on February 20th. For more information check out www.abcfp.ca/conference.asp.

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