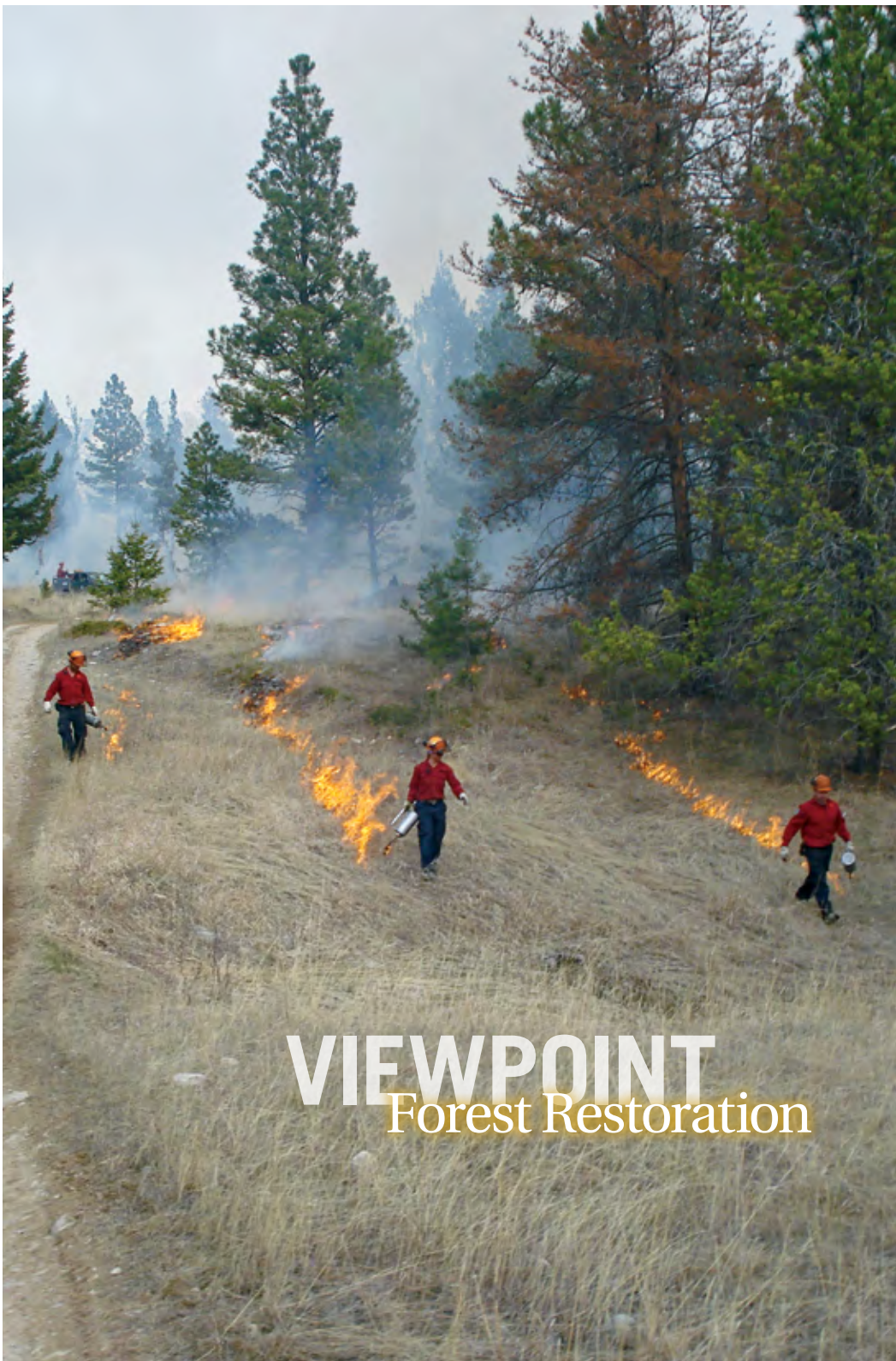
MARCH - APRIL 2013

BC Forest PROFESSIONAL

Setting Fire to Forests: A Case of Strategic Restoration

Managing Karst Ecosystems in BC

From Washington to Wales: International Perspectives on Forest Restoration



VIEWPOINT
Forest Restoration


LOOSE BARK
STAYING SAFE IS
A BALANCING ACT.
ROCKS
SNOW ON LOGS
HIDDEN ROOTS
SNOW COVERED GROUND
ICE
BC Forest Safety Council
Unsafe is Unacceptable
Winter walking conditions can be hazardous. Wear proper footwear.
Take smaller steps. Stretch to stay limber. It's easier to stay well than get well.
www.bcforestsafe.org


Forestry Through Your Eyes
We want to see forestry in BC through your lenses! If you capture a great shot and want share it with your colleagues, send it to Doris Sun at: editor@abcfp.ca for a chance to get published.
BC Forest PROFESSIONAL

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The **BC Forest Professional** letters' section is intended primarily for feedback on recent articles and for brief statements about current association, professional or forestry issues. The editor reserves the right to edit and condense letters and encourages readers to keep letters to 300 words. Anonymous letters are not accepted.
Please refer to our website for guidelines to help make sure your submission gets published in **BC Forest Professional.**

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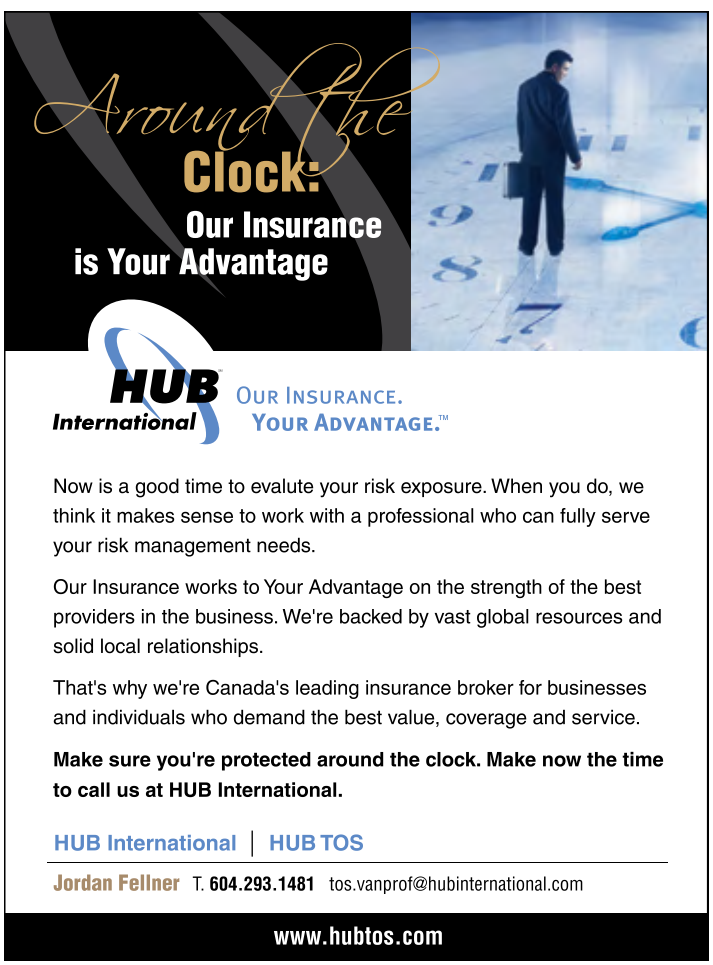

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Re: Attendants on the journey of good forest stewardship (January/February 2013)

A comprehensive definition of good forest stewardship can be found in the Montreal Process. The 1909 Fulton Commission advised the legislature that the public interest is served by ensuring a wise system of forest stewardship. The public interest and sustainable forest stewardship are almost one and the same.

BC politicians worked with the short-term public interest, essentially viewing the public forests as a gold mine. Our tenure system of timber harvesting rights was an expedient vehicle to make cash flow to the coffers of government and corporations. Adding on a few forest management requirements to this questionable foundation does not make good forest stewardship.

The Montreal Process red flags forest stewardship issues with a view to making improvements. Criterion 7 looks at the legal and institutional framework to see if it supports conservation and sustainable forest management. BC has significant stewardship and economic issues that can be traced to legal and institutional deficiencies.

Our sovereign legislature has achieved a milestone of over 100 years of failure as the trustee of our public forests. How will the short-term public interest be exercised over the next 100 years? Will our public forests be sold for a song, or continue toward gradual enclosure into the private interest through long-term leases?

Advocating improvement to our legal and institutional framework for good stewardship is most important. New institutional arrangements for trusteeship of public forests are the place to start. Local forest trusts with elected boards and professional forest management staff could operate forests under trust documents modeled on the Montreal Process. A BC Forest Trust Assembly governed by elected and professional delegates from local forest trusts could audit and provide collective services to local forest trusts. First Nation's could have local forest trusts, so there will be no need to alienate public forest land from the covenant of sustainable stewardship.

Sincerely,
Andrew Mitchell
RPF (RET) #898

President's Report

By Steve Lorimer, RPF

A Look Back and a Glimpse into the Future

There have been some significant anniversaries during this past year; the 100th anniversary of the BC Forest Service and the 65th anniversary of the establishment our association. While our world is considerably different than it was in 1912 or 1947, issues like Crown land tenures and long-term management goals remain. For me personally, it has been 40 years since I graduated from UBC (marked by a class reunion in Parksville) and of course one year as president of the association.

During my term I had the privilege of building on the work of previous presidents and councils by attempting to increase awareness of what the ABCFP is and who our members are. We made a concerted effort to work with various stakeholders this year and to maintain the good relationships with our fellow resource professionals. We attended conferences as well as meetings with key stakeholders.

One focus of these meetings was our government stakeholders. In addition to attending all of the public hearings initiated by the Special Committee on Timber Supply, we met with senior bureaucrats and elected officials to discuss the issues of mid-term timber supply and forest inventory. As a result of those meetings, we were invited to contribute to the discussion on tenure reform – one of the recommendations of the Special Committee. In addition to provincial government stakeholders, we also met with municipal leaders at the annual Union of BC Municipalities conference.

Building awareness and reaching out to stakeholders will continue to be a priority for 2013 as we go into a provincial election. Forest management will be impacted by the provincial public policies and we need to ensure government is aware of the role of the forest professional, and the way we can aid in ensuring the benefits from our forests are maintained over the long term.

I would like to acknowledge and thank the staff and council for the dedication and work they each undertook during this past year.

It is not possible in this brief article to acknowledge the many and diverse areas that the association is engaged in but with effective use of the governance model, council has during the year been able to focus on the priority areas identified within the strategic plan. Thanks to our CEO, Sharon Glover, the association has made prudent use of staff and fiscal resources.

Douglas Campbell, RFT; Michael Sandvoss, RFT; and Christopher Stagg, RPF; were elected as new council members. I would like to both congratulate and welcome you to what I believe will be a rewarding experience. There was a talented group running for council and I also thank each person who chose to run.

During 2012, we were pleased to fill the second lay councillor position by welcoming Scott Manjak, who along with our other lay councillor, Rod Visser, provides that special public perspective to council business. Thank you both for your contributions and interest in the ABCFP.

To our outgoing councillors, Ian Emery, RFT (past president); Carl vanderMark; RPF, and Carolyn Stevens, RFT, thank you for your advice and valuable contributions to the work of council and the association. Council meetings will not be the same without you!

I would be remiss if I didn't acknowledge and thank the committee members and the volunteers who donate their time to the many functions of the association. Our success would be severely compromised without your dedicated participation. Thank you!

Moving to our 66th council, it will be in good hands with our incoming president, Christine Gelowitz, RPF, and Dan Graham, RPF, vice-president. I look forward to lending support as past president during the upcoming year as we seek to fill our vision of leading the way to diverse, healthy and sustainable forests in British Columbia.

CEO's Report

By Sharon L. Glover, MBA

Are You Competent to Work with Aboriginal Peoples?

Aboriginal rights have been in the news for many months now as the *Idle No More* movement seeks meaningful dialogue with the Harper government. In BC, only a handful of treaties have been signed but hundreds of bands are at various stages of the treaty process. More and more Aboriginal communities are being granted forest tenure and this is just the beginning.

Forestry is an excellent choice for Aboriginal and non-Aboriginal youth who enjoy being outdoors and working in nature. In Aboriginal communities, forestry is becoming a favoured profession for its youth because it means the band will have well-trained and educated community members who can look after the community's forest tenure.

For the past several years, the ABCFP has been working with Aboriginal groups to encourage youth to choose careers in forestry as well as to reinforce the need for forest professionals to do forestry work within Aboriginal communities.

We have a very good relationship with post-secondary schools that appeal to Aboriginal students. For example, Brian Robinson, RPF, director of professional development and member relations, is an active member of UBC's First Nations Council of Advisors. We provide recruitment materials and speakers to all post-secondary forestry programs.

As important as it is to reach out to post-secondary students, we recognize that we have to give younger students the information they need to make career choices. To that end, the ABCFP created a new Aboriginal Faces of Forestry brochure and is a regular participant in Aboriginal career fairs around the province. Whenever possible, we invite our Aboriginal members to participate in these career fairs as well.

Facts about Aboriginal Members at the ABCFP*

	First Nations	Metis	Inuit	Total
RFT	49	25	1	75
RPF	33	41	1	75
Enrolled	10	7	0	17
Total	**92**	**73**	**2**	**167**

*As at December 2012

For the first time ever, the ABCFP is attending the National Aboriginal Business Opportunity Conference in Prince Rupert in April. We hope to make some good contacts as well as share the forestry opportunity with elders, community leaders and teachers. We'll be bringing our recruitment materials and offering to have forest professionals speak in local schools.

We will continue to reach out to Aboriginal groups but members also have a responsibility to ensure they are fully competent to work with Aboriginal communities on their forestry plans. Even if you don't work for an Aboriginal community or Aboriginal-owned forestry company, chances are you will want to consult with a First Nations group at some point during the course of any planning work you do for your employer or client.

Do you feel competent to work with First Nations? One great way to increase your competency is to take the workshops offered by Indigenous Corporate Training (ICT). ICT offers a number of in-person and online workshops including their flagship workshop Working Effectively with Aboriginal Peoples. You can find more information on their website (http://ictinc.ca/).

Today, many Aboriginal people involved in forestry work for community owned logging companies. Forestry jobs like logging and operating heavy equipment are important sources of employment in Aboriginal communities; however, we feel very strongly that the best hope for long-term employment is to become a forest professional. The ABCFP will continue to encourage Aboriginal youth to choose forestry and members can help by becoming competent in Aboriginal consultation, volunteering to talk to youth at career fairs or even by mentoring young Aboriginal workers in their companies.

Association News

The ABCFP Is Improving Our Practice Review Process

In order to offer a stronger assurance to the public of our members' competency, we have changed our practice review process this year. Instead of choosing 70 members at random for an administrative-based practice review, we will be choosing 70 members based on their aspects of professional practice and will require 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 members' 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.

Registered members, special permit holders and Natural Resource Professionals will be required to participate in this new quality assurance program. Here are a few more details about this new process:

1. Voluntary and mandatory peer reviews are now required to be submitted to the ABCFP practice review specialist, Jim Crover, RPF, and their content will be treated as confidential.
2. The practice review specialist will audit submitted peer reviews and may follow up on any recommendations.
3. There will be a limited number (10 - 15) of risk-based practice reviews conducted each year.
4. Qualified consultants will be chosen to carry out the risk-based practice reviews.
5. For risk-based practice reviews, members will be chosen based on their area of practice (low, moderate and high risk practice areas will be considered).

Vote Now on Changes to the ABCFP Bylaws

In 2012, council approved a plan to update the association's bylaws in four phases. Phase one was completed in last year and we are now in phases two and three.

Phases Two and Three: Modernization and Housekeeping

We are now moving forward on the second and third phases which will involve changes required to modernize the bylaws and general bylaw housekeeping.

There are more than 60 changes necessary to update our bylaws in terms of modernization and housekeeping. Because of the large number of changes, we have decided to break the bylaws into four batches and members will vote in four bylaw ballots. Associate Members will only be voting on bylaws that pertain to them in each batch.

Active registered and retired registered members (RPFs, RFTs, RPFs(Ret), RFTs(Ret)) in good standing are eligible to vote on all bylaw changes presented in each batch.

- Vote on Batch 1 (Bylaws 1-4)
  Voting closed on February 6, 2013.
- Batch 2 (Bylaws 5 and 6)
  Voting closes on March 13, 2013.
  Associate members (ATCs, ATEs and SASs) in good standing are eligible to vote on changes to Bylaws 5.22, 6.91, 6.92, 6.95, 6.96, 6.97, 6.98 as presented in batch 2.
- Batch 3 (Bylaws 7, 8 and 9)
  Voting is open from March 27 - April 10, 2013.
- Batch 4 (Bylaws 14 and 15)
  Voting is open from April 24 - May 15, 2013.
  Associate members (ATCs, ATEs and SASs) in good standing are eligible to vote on all bylaw changes presented in batch 4.

Phase Four: Updating Signing and Seal, Standards of Practice Bylaws and Other Miscellaneous and Required Amendments

The final phase will involve Bylaws 10 (signing and sealing) and adding another standard to Bylaw 12 (standards of professional practice), as well as any other miscellaneous or required amendments. Look for more information on the ABCFP website in May.

Learn about the bylaws and how to submit your vote online or by mail on the Bylaw Package page of the website.

Check Out the New One-Stop-Shop Professional Development Experience

Check out the ABCFP's Continuing Professional Development (CPD) page for a one-stop professional development experience.

- Find out what type of professional development is available to suit your needs.
- Apply for a voluntary certificate of professional development.
- Use our handy fillable PDF tool to record your CPD. You probably engage in more CPD than you think and this tool is a good prompt to ensure all of your CPD activities are recorded.
- Find out more about peer reviews and practice reviews.
- Check out the links to ABCFP legislation, bylaws and practice advice, CPD opportunities provided by the ABCFP and CPD opportunities from external providers.

If you know of any other CPD opportunities that should be added to the web page and would be of benefit to ABCFP members, contact Brian Robinson, RPF, director of professional development and member relations at brobinson@abcfp.ca.

The Forest Professional and Non-Statutory Expectations in Due Diligence Defence under FRPA

The ABCFP is addressing non-statutory expectations (NSE) by developing guidance to members that provides a common understanding of the non-statutory expectations of its members. Two guidance documents were made available to members on the ABCFP website in November 2012 (*A Description of Non-Statutory Expectations and The Practice of Professional Forestry and Applying the Obligation to Weigh and Balance in Professional Service*). A new guidance document, *Due Diligence Defence Under FRPA and the Role of Professional Service*, is now available on the website. It describes areas of a forest professional's practice that may be used as a due diligence defence under FRPA.

New ABCFP Climate Change Task Force Established

The ABCFP Climate Change Task Force (CCTF) is a subcommittee of the Stewardship Committee (SC) and the Professional Practice Committee (PPC.) The task force is designed to provide expert advice to the SC and PPC regarding how climate change can impact our forests and the forestry profession. Some of the current work includes:

- A climate change awareness survey of ABCFP members
- Tallying the current range of climate change resources available
- Collaborating with other professions

The CCTF is comprised of 12 members from the ABCFP, one university liaison and one liaison to BC's climate action secretariat.

By Doris Sun

Photo: Paul Griffiths

Challenges and Opportunities in Forest Restoration

Forest restoration is a multi-faceted and often contentious topic, depending on what side of the forestry sector one stands. Some will point to current restoration efforts as being comprehensive while others argue more needs to be done to restore the delicate ecosystems of a disturbed site.

This issue of **BC Forest Professional** looks at both examples of restoration successes and areas where improvement is necessary to effectively repair ecologically disrupted forest lands. Authors examine specific barriers that prevent the remediation of disturbed forests and offer potential solutions on how those forests can recover. The use of fire on land to accomplish predetermined forest management objectives is also discussed, while the balancing of delicate forest and grassland ecosystems is weighed. An industry perspective is also included in this issue, as we learn about the regulatory components of the BC Oil and Gas Commission in Northeast BC. International perspectives provide additional context, as an author from Washington State discusses riparian restoration methodologies while another author from Wales examines options for remediation of slate quarry waste sites.

Global perspectives also extend to our interest stories, as we follow one forestry professional through a tour of a forest in Poland and learn about unique forest management practices in that country. In yet another example of the breadth of this topic, we hear about the management and remediation of BC's forested karst ecosystems.

The Principles of Forest Stewardship[1] and Forest Restoration

There is a clear linkage between forest stewardship and restoration, as evidenced by the wealth of information available on the subject. The World Resources Institute[2] defines forest restoration as '*Restoring functionality and productive capacity to forests and landscapes in order to provide food, fuel and fiber, improve livelihoods, store carbon, improve adaptive capacity, conserve biodiversity, prevent erosion and improve water supply.*'

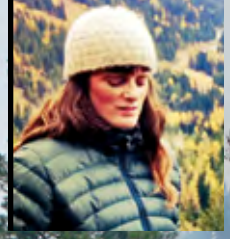
This definition highlights several of the ABCFP's principles of forest stewardship, as it links the forest's productive capacity with the ability to provide ongoing benefits and values to society. Within the principles, the starting point for management or restoration activity is the development of **Goals and Objectives**. For example, you may have encountered sites that were harvested when the soils were too wet or with equipment that was not suitable, resulting in high soil compaction levels. This compacted soil may have then resulted in a plantation that is not sufficiently re-stocked. The decision to intervene and restore such a site must be based on a clear objective for the forest ecosystem and be mindful of both the stand and landscape level implications. This objective may be focused on stand productivity for timber production, or it may reflect a need to provide a vegetation complex and multi-layered stand condition for wildlife cover and forage in critical ungulate habitat. In the latter case, restoration activity is likely to entail more than one treatment. All restoration activities should include a subsequent monitoring program, to ensure the objective is being met or to adapt future treatments.

With an overriding goal of maintaining ecological integrity, forest professionals who are armed with and guided by a clear set of objectives, may find that the need for future restoration activity is greatly minimized.

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

[2] http://www.wri.org/project/forest-landscape-restoration

By Colleen Ross, RPF



A SMART Approach to Prescribed Fire Planning

Photo: Colleen Ross

The Canadian Forest Service offers a holistic definition of prescribed fire that can be applied in any context: the knowledgeable application of fire on a specific land area to accomplish predetermined forest management and other land use objectives. This article will support the importance of writing good objectives in prescribed fire planning, as the objectives set the context to apply prescribed fire skillfully in order to accomplish one or more of the following:

- Reduce hazardous fuels
- Prepare sites for seeding and planting
- Remove logging debris
- Improve wildlife habitat
- Manage competing vegetation
- Control insects and disease
- Improve forage for grazing
- Enhance visual quality
- Improve access
- Perpetuate fire-dependent ecosystems (ecosystem restoration)
- Cycle nutrients, and/or
- Manage endangered species (Bugwood.org)

Using fire as a tool is a complex practice and one of the greatest challenges that resource professionals are faced with is being able to choose appropriate SMART (Specific, Measureable, Achievable, Realistic and Time-Bound) objectives. It can be accomplished when wildfire management specialists and resource professionals collaborate through careful and thorough planning. An objective to "see the brush component and fire hazard decrease" is neither SMART nor beneficial and makes the rest of the planning process difficult to achieve. Here are some examples of good prescribed fire objectives.

Example 1:
Higher-level plan goal: Decrease fire hazard in the ponderosa pine forest.

Prescribed fire plan objective: To determine the herbaceous biomass and fine fuel load at the end of the growing season in a ponderosa pine forest is maintained at a level below 1,000 kg/ha.

Example 2:
Higher-level plan goal: Bring the range site back to its historic range of variability.

Prescribed fire plan objective: Decrease deciduous tree cover by 50% over the next 10 years.

Example 3:
Higher-level plan goal: Create an open forest that supports historic levels of ungulate use.

Prescribed fire plan objective: Double native grass biomass over the next 20 years.

Monitoring is another critical piece of the prescribed fire planning process that is tied directly to the objectives. Once objectives are established a monitoring plan should be in place to feed back into the adaptive management process of prescribing fire. Resource professionals construct and execute monitoring as an early-detection system to see if they are headed in the right direction, which enables them to take appropriate

See **SMART** continued on Page 24

By Julie Williamson

What We Can Do With 730 Megatonnes of Slate Quarry Waste in Wales

Slate dominates the cultural and visual landscape in many parts of North Wales and quarrying has driven the development of communities and culture for centuries. An estimated 98% of slate extracted from the ground is waste and although new equipment and techniques are lowering this figure, the mineral waste legacy of North Wales' 200-year industrial heritage remains. In the county of Gwynedd alone, an area of some 254,000 hectares, there are an estimated 730 megatonnes (Mt) of slate quarry waste, with a further six Mt produced every year. Slate quarry waste is an integral component of the Welsh landscape and attitudes towards it differ enormously – whilst some visitors to the area speak of slate waste tips as a blot on the landscape, many local people feel that their environment would be 'naked without them.'

Surveys reveal that the local communities value old tips and galleries formed by traditional methods and are concerned that re-vegetating these tips would hide this important heritage. Tips formed by modern methods and not hand-finished are not valued by the communities, who mostly want them re-graded and planted. With this in mind, a reclamation strategy was produced for Penrhyn Quarry.

Photos this page: Julie Williamson

Top: Plant establishment on clay after two years.

Below: Plant establishment on boulder clay after one year.

Reclamation

Natural regeneration of slate quarries is extremely slow with many sites remaining bare after more than a century of abandonment. Slate waste tips are blocky and free-draining, and lack topsoil, organic matter or mineral fines. Thus, the major limitations to plant establishment on slate waste are low water-holding capacity and nutrient availability. Typically, where growth is supported, native woody tree and shrub species are found on the lower slopes and heather moorland species colonize compacted areas higher up where trees do not grow.

A study was undertaken at Europe's largest slate quarry, Penrhyn Quarry, which is situated in Bethesda, North Wales. The quarry includes approximately 130 ha of slate waste tips, extending from 120 to 350 metres above sea level. Mean annual precipitation is 2,260 mm, mean annual air temperature is 9°C (range –6 to 29°C) and mean annual ground temperature at 5 cm depth is 10°C.

The waste slate was treated with water holding amendments (a 75 cm layer of boulder clay overburden placed over the slate), or a small quantity of polyacrylamide gel (PAM) placed into 3-litre planting pockets and fertilizer amendments (mineral NPK controlled-release fertilizer or an organic mix comprising biosolids and deinking paper fibre) placed into the planting pockets. Year-old seedlings of six native woody plant species, English oak (*Quercus petraea*), common alder (*Alnus glutinosa*), mountain ash (*Sorbus aucuparia*), grey willow (*Salix caprea*), birch (*Betula pendula x B. pubescens*) and gorse (*Ulex europeaus*) were transplanted into the pockets. Seedlings were raised on site from seeds also

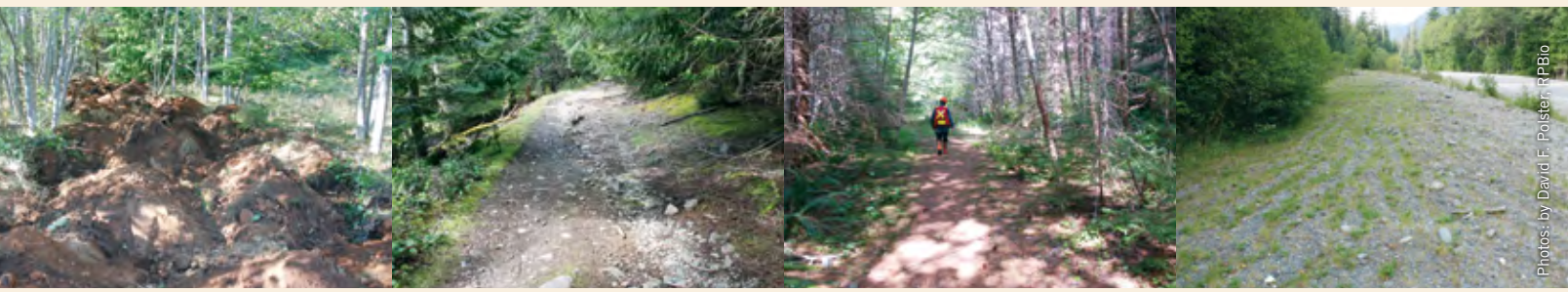
See **SLATE** continued on Page **27**

by David F. Polster, RPBio

Restoration of Drastically Disturbed Forest Sites

Loss of productive capacity associated with forest disturbances reduces future forest values. Forest productivity is founded on effective ecosystem functioning, which includes nutrient cycling and hydrologic system integrity, as well as a host of other ecological processes. Some activities associated with forest harvesting have negative impacts on forest ecosystems so effective restoration of forest disturbances is critical for the continued health of our forests.

What is effective restoration when it comes to forest health? Forests have been "restoring" damaged sites since the beginning of terrestrial vegetation over 400 million years ago. Landslides, fires, windstorms and glaciation have removed forests on parts of the earth's surface only to have them re-appear some years later. How does this happen? We use these natural processes as a model for the disturbances we create. The key is to identify the factors or filters, both biological and non-biological, that are constraining these natural recovery processes. In some cases more than one filter operates at a drastically disturbed site.



Photos: by David F. Polster, RPBio

Captions from LEFT: A) The rough and loose treatment on this old forest road will solve a number of issues and allow natural processes to restore the road. B) Compacted old road surfaces intercept near-surface groundwater and promote erosion. C) Compacted road surfaces prevent the establishment of pioneering species that would initiate the natural recovery processes. D) This road surface was scratched with the teeth of an excavator bucket resulting in a few cm. of de-compaction; not enough to allow forest growth.

Filters to Recovery

Polster (2011) listed eight abiotic (non-living) filters to recovery:

1. Steep slopes
2. Adverse texture (too fine or too coarse)
3. Nutrient status
4. Adverse chemical properties
5. Soil temperature extremes
6. Compacted substrates
7. Adverse micro-climatic conditions
8. Excessive erosion.

Six biotic (living) filters are listed by Polster (2011):

1. Herbivory
2. Competition
3. Phytotoxic exudates
4. Propagule availability
5. Facilitation (of one species to the exclusion of another)
6. Species interactions.

Many of these filters operate in concert to prevent the establishment and growth of vegetation. For instance, compacted substrates may prevent establishing plants from reaching nutrients and moisture; thus, these sites also appear to be nutrient and moisture limiting (Photograph 1). Similarly a dense, competitive cover of seeded grasses and legumes may foster establishment of hyper-abundant ungulate populations that limit the establishment and growth of woody species that in turn reduce populations of song birds and other species (Martin et al. 2011). Green (1982) identified the problems of small mammals associated with dense grass and legume covers. Trophic cascades (Falk et al. 2006) such as this can have far-reaching consequences for biodiversity and resilience (Holling 1973).

Solutions

Just as the filters that prevent recovery often act together, the natural solutions to these filters may solve more than one problem. For instance, when trees are blown over in a forest they can turn up large root wads and create open areas that are colonized by pioneering species. This natural process maintains these species in the ecosystem so they are available to address other disturbances in the forests (Straker 1996). In addition, the up-turned soils loosen compaction and bring the less mobile nutrients (e.g. P and K and various micro-nutrients) to the surface where they can be accessed by the roots of the pioneering species. The mounds of fresh soil associated with the root wads are located next to the holes from which the root wad came creating topographic heterogeneity (Larkin et al. 2008). Topographic heterogeneity provides conditions that promote species diversity thus the simple process of trees blowing over in the forest ensures the maintenance of diversity in the forest as well as providing successional and nutrient diversity.

Native pioneering species that operate in the area are selected as the species of choice for the initial vegetation establishment. These are generally readily available in the local area for the cost of gathering the propagules (seed or cuttings). Pioneering species are usually easy to establish and need little or no maintenance. Growth rates of pioneering species are generally exceptional on the adverse substrates that are common with drastically disturbed sites. These species will quickly build soils on barren sites and create conditions that will foster the growth of later successional species.

The use of natural processes can greatly reduce the costs associated with recovery of drastically disturbed sites. By harnessing the

See **RESTORATION** continued on Page **22**

By Cathy Koot, RPBio

Grassland Regained

Photos: Cathy Koot, RPBio

Photo sequence at restoration site from TOP to BOTTOM: pre-treatment forest ingrowth 2007, post-tree removal and prescribed burn May 2008, July 2008, July 2009, July 2011

Grasslands occur where climates are too harsh for tree growth — in BC, cold and short growing seasons at high elevations and very dry moisture regimes at lower elevations have led to the establishment of grassland ecosystems across approximately two percent of the province's land base. BC grasslands are biologically rich, relatively scarce and home to the highest concentration of species-at-risk in the province.

The boundary where a grassland community ends and the forest begins is a dynamic one. In years that are wetter than normal, tree seedlings can gain a foothold among the competing grasses and seemingly advance or encroach onto the grassland. Likewise, in droughty years or those experiencing fire, trees along this edge can die back. Since the late 1800s, trees have had the definite advantage over grass following the cessation of Aboriginal use of fire and implementation of fire suppression practices. Forest encroachment and subsequent in-growth has significantly reduced the area of native grassland, especially in transitional areas that provide suitable growing conditions for both grasses and trees.

In the Cariboo-Chilcotin, much of this ecotone occurs in the Very Dry Mild Subzone of the Interior Douglas fir Zone (IDFxm). In the early 2000s, the Cariboo-Chilcotin Grassland Strategy established a "Grassland Benchmark" based on those areas mapped as open range during the first systematic forest inventory conducted in the mid-1900s. Falling under the regional Land Use Plan, benchmark areas are to be managed, and in many cases restored, as native grassland.

The Knife Creek block of the University of British Columbia's Alex Fraser Research Forest near Williams Lake, BC, contains four hectares of grassland benchmark for which restoration was identified in the Management and Working Plan. The research forest implemented a restoration project at this site with provincial funding assistance in the winter of 2007/2008, using Cariboo-Chilcotin Grasslands Strategy Working Group management guidelines.

At the site level, the grassland boundary was identified by the presence of residual grassland species in the understory and the fairly even-aged nature of the encroachment trees in comparison with the uneven-aged stand structure of the adjacent Interior Douglas-fir forest. Veteran Douglas-fir and clumps of potential future veterans were marked for retention to maintain the open forest nature of transitional grasslands. Scattered live trembling aspen were likewise retained for habitat values.

Existing downed wood was to be retained intact to continue providing habitat and ecosystem functions, and skid-trails were located to avoid disturbing these features. Logs and logging debris, however, were to be removed to a landing outside the restoration site to minimize soil disturbance. From previous experience with a nearby thinning project, we know that the needles from Douglas-fir slash left on the ground can accumulate to over 20 cm depths and smother the groundcover. The volume of debris was expected to be considerable due to the tree density and therefore very likely

See **GRASSLAND** continued on Page **29**

More About the Cariboo-Chilcotin Grassland Strategy

The 2001 Cariboo-Chilcotin Grassland Strategy, led by provincial land management agencies, established a strategic framework for grassland conservation in the region by defining the grassland benchmark area and recommending management objectives in relation to range, biodiversity and timber values in the regional Land Use Plan. Best management practice guidelines and a restoration plan were created and several areas of encroachment underwent restoration throughout the last decade.

Restoration efforts have been implemented in fire-maintained ecosystems elsewhere in BC, e.g. Rocky Mountain Trench, Thompson-Okanagan, Cascades and Vanderhoof.

The Ecosystem Restoration Provincial Strategic Plan (www.for.gov.bc.ca/hra) was drafted in 2009 as a multi-agency provincial initiative with an initial timeline extending to 2012.

By Devin Scheck, P.Ag. and Akbar Khan, PhD, P.Ag, PEng

Photo: Devin Scheck, P.Ag.

Oil and Gas Site Restoration in Northeast BC

The BC Oil and Gas Commission (Commission) was created in 1998 to act as a single-window regulatory agency for upstream oil and gas activities in BC. The Commission is mandated under the *Oil and Gas Activities Act* (OGAA) to oversee oil and gas activities from initial permitting through to final site restoration. Forefront among the legislated purposes of the Commission is to ensure applications are carefully reviewed and approved in the public interest with regard to environmental, economic and social impacts.

Oil and Gas Site Restoration Process

Restoration requirements in OGAA and its associated regulations are in place to ensure that sites no longer required for exploration and production are restored to a safe and productive state. A permit holder is required to reclaim a site and receive a Certificate of Restoration (CoR) before it is allowed to cease payment on a surface tenure. Decisions made by the Commission in issuing a CoR are guided by the Contaminated Sites Regulation (CSR) standards as established by the Ministry of Environment (MoE) with limited allowance for risk-based approval.

In 2006, the Commission introduced a robust two-part CoR process. Part I of the process involves site investigation to evaluate the presence and potential impacts of any residual contamination and the effectiveness of remedial actions associated with the activity. Part II evaluates the acceptability of surface reclamation.

Environmental Investigation

The most technical and typically most costly aspect of restoration is the environmental investigation to assess the presence of contamination and any required remediation. If remediation is required, a site classification form must be completed to determine if the site is a priority site. The priority site's classification was developed in consultation with MoE to ensure sites posing a high potential for contaminant impacts are overseen by its Land Remediation Branch. For such sites, the Commission will not issue a CoR until the MoE has determined the site is no longer high risk and the permit holder has appropriately managed and mitigated any potential impacts of residual contamination. For sites that are not classified as priority sites, the Commission oversees remedial activities and may issue a CoR once the permit holder has met legislated requirements.

When investigation and, if necessary, remediation is complete, the permit holder submits a CoR Part I application to the Commission. This application must be completed by a qualified professional and include an environmental status report detailing any investigation and remediation activities, a site classification report and a site profile as required under the CSR. These applications are reviewed by licensed professionals from the Commission who evaluate the adequacy of the investigation and remediation activities and may accept the application, require further information about the site prior to making a decision, or require further investigation and forward the site to MoE.

One challenge with the assessment of upstream oil and gas activities in northeast BC is in relation to muskeg environments, where an estimated 30% of well sites are located. These soils have high organic content and often high moisture content. Laboratory analysis of organic soils using methodologies developed for mineral soils may result in interference from naturally occurring organics. These organics mask the analytical results for petroleum hydrocarbons and high moisture contents and result in exaggerated contaminant concentrations when reported on dry weight basis. Such circumstances can be reasonably dealt with using professional reliance and alternate analytical approaches supported by sound scientific evidence. When and where appropriate, a qualified professional may present a well-supported, evidence-based approach to explain false positives for consideration with their application.

It should be noted that the issuance of a CoR does not extinguish environmental liability under the *Environmental Management Act* and the liability provisions of the act apply to all oil and gas sites.

See **CoR** continued on Page **28**

By Florian Deisenhofer

Riparian Restoration: A Win—Win in Washington State Forests

Stream-parallel view of a 200-foot (total width) RMZ thinned from below to initiate conifer regeneration

Pole removal and thinning from below were used to accelerate the development of large trees. Co-dominant trees were felled towards the stream (foreground).

Photos this page: Florian Deisenhofer

Riparian areas comprise the backbone of multi-species habitat protection on public lands and make up a large percentage of the forested landscape in western Washington. The Washington State Department of Natural Resources (DNR) manages 607,000 ha of forested land west of the Cascade crest under a Habitat Conservation Plan with the following objectives: maintain and restore salmonid habitat and contribute to the conservation of other aquatic and riparian obligate species.

Approximately 33% of these western Washington lands are in Riparian Management Zones (RMZs). Many riparian forests are relatively young, contain little species or structural diversity and are in the stem exclusion phase of stand development. Riparian forest functions, in particular the ability to provide large in-stream down wood, have been impacted by extensive clearcut logging in the earlier part of the 20th century. The key elements to restore riparian functions are large trees, a complex stand structure and a species composition that includes long-lived tree species. The goal of riparian restoration should not be a specific, narrowly-defined older forest condition, but an effort to move simple-structured stands more quickly through the phases of competitive stem exclusion.

For DNR, this meant creating a two-phased approach: early intervention through riparian silviculture (primarily thinning) to an intermediate benchmark – the Riparian Desired Future Condition (RDFC) – followed by a passive (hands-off) approach only allowing creation of habitat structures like snags and down wood. The RDFC not only constitutes the endpoint of management but more importantly, serves as an intermediate and measurable target to determine if and what kind of riparian silviculture may be needed.

The DNR has developed a relatively prescriptive approach to riparian restoration (Riparian Forest Restoration Strategy, WA DNR 2006). The emphasis is on moderate thinning from below or the middle (removing mostly the smallest or medium diameter overstory trees) to increase residual tree diameters, to favour site-adapted conifer species such as western red-cedar and to recruit or release understory conifers.

Thinning treatments leave a minimum 7.5 metre no-harvest inner zone and retain at least 185 trees per ha or a Curtis relative density[1] of 35 in the remainder of the RMZ. Thinning to these residual levels allows the regeneration and release of shade-tolerant conifer species in the understory, because the thinning treatments are not leaving a homogeneous stand. In the case of adjacent upland regeneration harvests, edge effects additionally create favorable light conditions in the RMZ. In general, the intensity of thinning decreases from the edge of the riparian buffer towards the stream for operational and ecological reasons. Underplanting of conifer seedlings is used in areas that lack a shade-tolerant seed source.

For every thinned hectare, a minimum contribution of 12 "enhancement" trees is required. These are primarily larger conifers that are felled towards the stream to provide in-stream down wood. By felling dominant or co-dominant conifers into and across streams from outside the 7.5 metre zone, in-stream down wood is augmented by trees that naturally would have a low probability of contributing, especially during this phase of stand development. Some snags may also be created

[1] Curtis RD is a measure of stand density where RD = the stand basal area /√ stand quadratic mean diameter. Curtis, R.O. 1982. A simple index of stand density for Douglas-fir. Forest Science 28:92-94. RD 35 is the lower limit of full site occupancy, RD 55-60 is the onset of self-thinning.

See **WIN—WIN** continued on Page **29**

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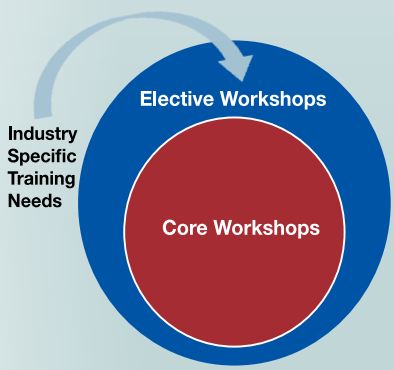

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Project Management for Natural Resource Professionals VC

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Date: April 12, 2013 Location: Prince George, BC Cost: $295

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Date: May 13 - 14, 2013 Location: Prince George, BC Cost: $630

GPS for Silviculture Surveyors

Date: May 15, 2013 Location: Prince George, BC Cost: $195

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Date: June 3 - 14, 2013 Location: Kamloops, BC Cost: $1800

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Date: June 4 - 6, 2013 Location: Prince George, BC Cost: $395

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Date: June 18 - 19, 2013 Location: Burns Lake, BC Cost: $225

VC *Delivered via video conference to any organization with video conferencing capabilities.*

All photos by Paul Griffiths

Managing and Remediating Forested Karst Landscapes in BC:

An Ounce of Prevention is Worth More Than a Pound of Cure

Achieving consistently high standards of professional care in forest stewardship activities entails using the best available science, expertise and practices. Given the sensitivity of BC's forested karst ecosystems, there is a high potential for adverse impacts to occur, not only during forestry activities, but also during attempts to restore damaged karst sites.

When operating on karst areas, it is important that forest professionals seek advice and expertise from qualified and experienced karst professionals during the planning/layout stage to minimize unnecessary impacts to karst ecosystems. In this way, karst management strategies can be built into site plans to ensure that harvesting, road building, and silviculture activities adhere to recommended best management practices.

The term *karst* describes a topography formed primarily by dissolution of certain bedrock types - mainly limestone, dolomite, marble and gypsum. The result is a three-dimensional landscape generally lacking surface watercourses and with a complex subsurface component. Drainage is largely internal, through solutionally-enlarged fractures and fissures in the underlying near-surface bedrock, referred to as *epikarst*, and then into the deeper karst. Though not always present, sinkholes and other distinctive landform elements often provide evidence of subsurface karst development. The intensity of karst processes depends on a number of different variables including bedrock characteristics, physiography, vegetation and soil cover. The evolution of the resulting karst landforms and ecosystems vary across BC, from the rainforest karst of the coast to the alpine karst settings of the Rockies.

Karst occurs in all of BC's forest regions and contributes in many ways to the social and economic well-being of British Columbians. High scenic values are often linked to surface karst features, landscapes and caves. Karst systems supply water to many fish-bearing streams and occasionally serve as drinking water sources. Complex karst topography provides a wide array of surface microhabitats, and subsurface karst voids are habitat for terrestrial and aquatic fauna, including some red and blue-listed species.

Karst terrains are particularly vulnerable to land use activities, such as industrial forestry, due to the surface-subsurface connectivity or openness. Depending on a particular karst site's sensitivity, removal of forest cover can result in a range of adverse environmental impacts.

A first principle for managing karst is to avoid or limit disruption of the soil-vegetation system. Soil and sediments are easily eroded from the surface of some karst sites and moved into the epikarst and subsurface conduits where they can be readily and rapidly transported and deposited in other parts of the karst system or discharged at springs. Changes to water infiltration and the input amounts of nutrient and sediment can detrimentally alter the hydrology, biology and ecology of subsurface karst environments. Remediation of subsurface flowpaths and habitats is considered to be practically impossible.

Management strategies for forested karst in BC have evolved since the 1990s — from an approach that focused primarily on caves and their recreational management — to one that subsequently focused on protecting and managing karst as a hydro-geo-ecosystem. Today, government orders in six coastal BC forest districts made pursuant to regulations under the *Forest and Range Practices Act* identify the elements of karst systems to be protected when constructing or maintaining roads, harvesting timber and conducting silviculture activities.

Historical logging practices have impacted numerous surface and subsurface karst areas and features of significance, mostly in the forested karst landscapes of coastal BC. Detailed inventories of potential remediation sites are needed before they can be properly evaluated. A

See **Karst** continued on Page **28**

Interest

By Paul Griffiths

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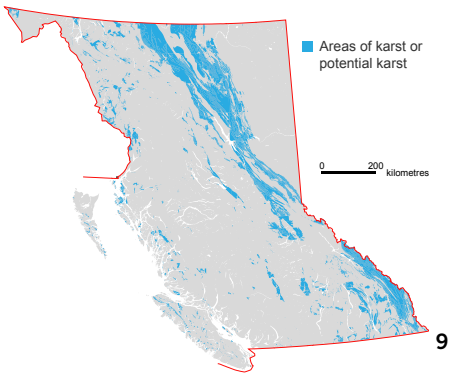

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OPPOSITE PAGE: In forested regions, natural karst processes are largely dependent on the life cycle of the trees and associated soils. The forest vegetation produces the organic soils which play an important role in producing carbon dioxide and carbonic acid which in turn plays a major role in the chemical dissolution of the underlying bedrock. Soils also help to accelerate the dissolution process by lengthening the contact time of the solvent with bedrock.

IMAGE 1: Logging over thinly covered karst sites can make them more prone to severe soil loss. Wildfires and prescribed burns on logged karst sites can incinerate organic soils and alter bedrock surfaces.

IMAGE 2: Sinkholes commonly occur where sufficient drainage can carry away soil and sediment and dissolve bedrock. Even small and shallow sinkholes provide evidence of a karst system and are therefore vulnerable to surface disturbance. The cost of remediating discrete karst features such as sinkholes has ranged from hundreds or thousands of dollars, to tens of thousands of thousands per feature. Sinkhole density in some karst areas of BC can exceed 10 features per hectare.

IMAGE 3: Post-harvest edge windthrow can dramatically alter significant karst sites and features within retention areas. Salvage logging of post-harvest windthrown timber on sensitive karst sites and features must be carefully evaluated.

IMAGE 4: [LOOKING INTO FEATURE] This collapse karst feature began to develop after harvest operations. It continues to grow and is now easily seen in Google Earth. These karst hazards can pose a significant continuing risk to human safety and forestry activities.

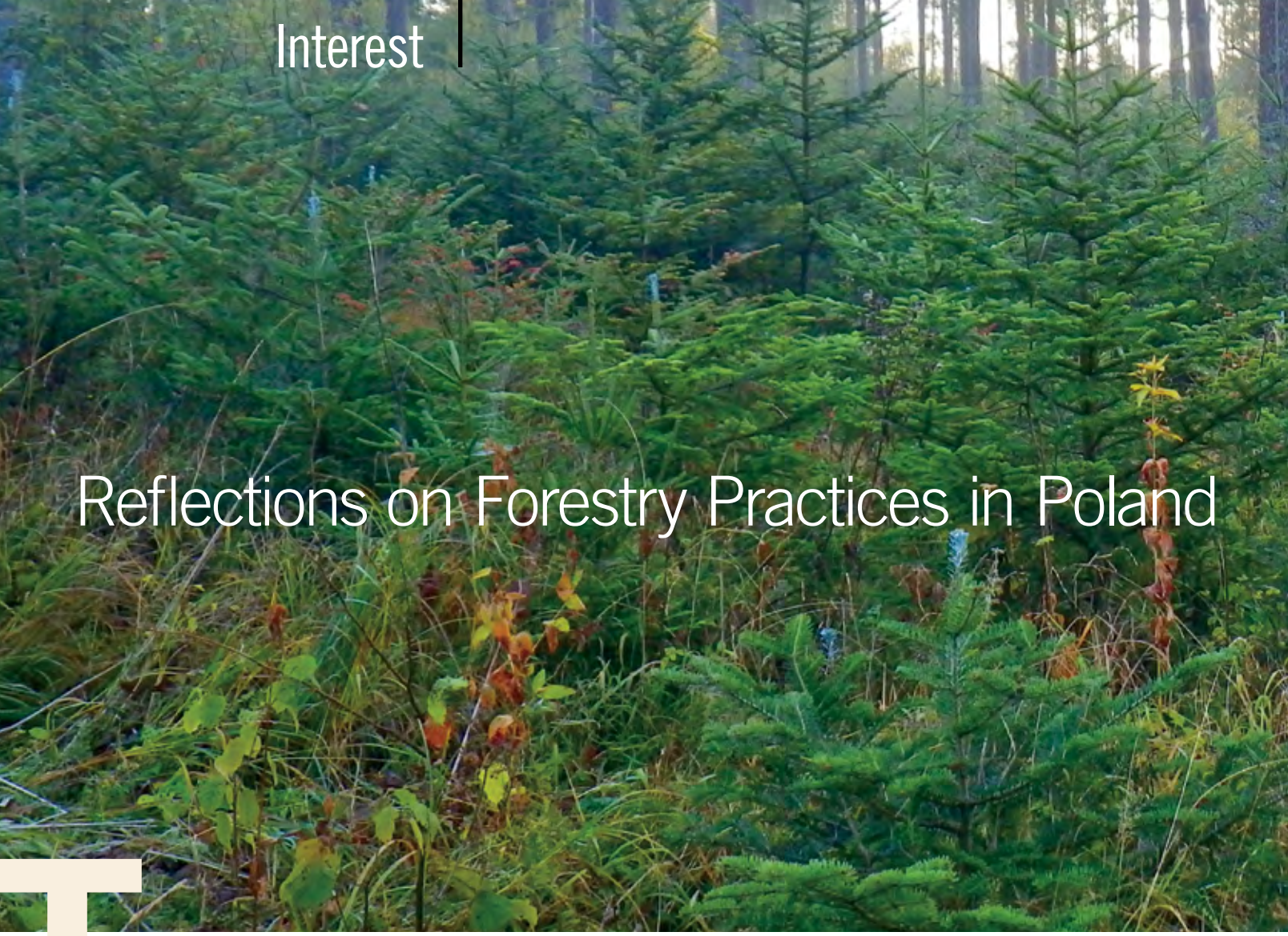
IMAGE 5: [LOOKING OUT OF FEATURE] The outline of a small excavator is shown for approximate scale.

IMAGE 6: This small stream disappears underground in a karst system.

IMAGE 7: Some thinly mantled karst areas in BC are recognized for the growth of valuable timber despite the limited capacity of the soils to store water and nutrients. This is testament to the role of epikarst as an important source of nutrients and moisture even during periods of drought.

IMAGE 8: Suffosion sinkholes may appear after harvest operations and stay active.

IMAGE 9: Where is karst in BC? Geological formations containing soluble rocks underlie approximately 10% of the province, providing an extensive area for potential karst development. Whilst a significant amount of BC's karst is found in remote alpine and subalpine mountainous regions where harvesting is not prevalent, well-developed karst systems are common in forested regions with higher commercial timber values. The rainforest karsts of coastal BC and southeast Alaska are the world's only coniferous temperate rainforest karstlands. Vancouver Island's karst occurs over four per cent of the landmass with more than 94% under forest cover. More than 70% of the Island's forested karst landscape has been modified by mechanized logging and forestry roads.



Reflections on Forestry Practices in Poland

This past fall, 33 years after I graduated from my Alma Mater, the Agricultural University of Cracow in Poland, I returned for our class reunion. It was great to see my classmates in good health and spirit, and also reassuring to hear all had remained faithful to the forestry profession, in many cases enjoying successful careers.

While at the reunion, I was invited by my friend who manages the forest district in southern Poland's mountains to take a weeklong tour of forests and forestry of southern Poland. I would like to share my impressions of the tour with you.

For starters, one must consider that Poland's terrain can be likened to the Northern/Central Interior of BC, and yet the population is larger than that of Canada. Poles often talk about "wilderness," which brings a smile to a seasoned Canadian forester's face. In Poland you can literally cross half the country with nothing more than a sandwich in your pocket.

What Poland lacks territorially, it compensates for by very intensive forest management practices. From the forested area of seven million hectares, they produce 32.4 million m^3 of logs. Compare this to the North Central Interior area of 25 million hectares of productive forests and 30.4 million m^3 of AAC. Almost half of the annual cut comes from thinning or pre-commercial operations in Poland.

Photo 1 shows a forest stand of pure Norway spruce (*Picea abies*) with the volume of 1000 m^3 per ha at the age of 150 years. These are exceptional stands, managed primarily as a source of seeds.

Much more common are mature forest stands of Scots Pine (*Pinus sylvestris*), **Photo 2**; Silver Fir (*Abies alba*) and Common Beech (*Fagus sylvatica*) of around 400 m^3 per ha. Generally, forests are quite young in Poland with the average age being only 62 years. A temperate climate coupled with intensive silviculture efforts result in an annual growth increment of 9.5m^3 per ha.

Every forest estate is physically divided into roughly 30 ha compartments with cut lines, roads or trails delineating boundaries. Practically, each piece of the estate can be accessed at any time of the year. This makes intensive management such as regular inspections, spacing, thinning and pre-commercial harvest possible.

Forests in Poland are classified for management purposes into two broad categories: 51% of all managed forests are designated as commercial forests, where production of wood fiber in various forms is the primary purpose. The remaining 49% are designated protection forests, where protective functions are primary, but some level of commercial harvest is maintained. This category includes forests that protect water resources, soils or critical wildlife habitats, but also forests located in close proximity to cities (where the recreational value is high), and those damaged by industrial pollution. The forests I visited in southern Poland were 80 to 90% protection forests, which contributed very little to the country's annual cut and to the creation of revenue. This brings me to the organizational structure and self-financing of the forest enterprise in Poland.

Interest

By Kris Zmudzinski, RPF, MBA

Photo 1: *Norway Spruce stand is the pride of this forester*

Photo 2: *Scots Pine forest*

Photo 5: *Foresters in uniform*

Photo 4:
Emblem of Polish State Forests

Main Photo 3: *Example of Selection Silvicultural System, close to final removal. Note that naturally regenerated trees of silver fir have their terminal buds protected against grazing by wildlife.*

Photos this spread: Kris Zmudzinski, RPF, MBA

In Poland, 82% of all forests are publically owned. Excluding national parks, state forests are managed by the Forest Service (Sluzba Lesna). The Forest Service is in charge of all aspects of forest management including harvest planning, harvesting and stump to landing skidding (with the help of contractors). Depending on the forests' designation, species composition, and management objectives, forests are managed in a variety of silvicultural systems. About 18% of the country's forests are managed using the clearcut system (average clearcut size is six ha, which they call "large scale" removal) and the rest are managed using either the shelterwood system with 10 sub-types, or the selection system with two sub-types (**Photo 3**). Sorted out material is stored on landings and then auctioned off via an Internet-based system. Since Poland is part of European Union, any European buyer can place their bid for Polish wood. There are no restrictions on export of raw logs within the EU. The prices (loco landing) for high quality spruce and pine logs in one forest district I visited were between $150-170 CAD per m^3. Hardwoods like beech and maple went for $160-290 CAD per m^3. Nationally, sale of logs generates about $2.5 billion CAD in revenue per year.

State forests (**Photo 4**) retain all of their revenue, which covers all costs related to harvesting, silviculture, wildlife management, fire and insect protection, administration and taxes. In 2011, the generated net income was $280 million CAD. A large portion of this income goes into the equalization fund to finance activities of those forest districts where logging is limited due to the protective character of the forests.

Each year, Poland exports 1.5 million m^3 of logs, but also imports a similar amount from neighboring countries. Poland's wood processing industry is well developed, highly diversified and very competitive.

The Forest Service is by far the largest employer of foresters in Poland. Currently, it employs 16,000 people, with 4,000 of them female (**Photo 5**). To be employed (or rather "admitted into the ranks" of the Forest Service), a candidate must have high professional qualifications, no criminal record and an impeccable reputation. In addition, a candidate must have practical experience and must pass an entrance exam. This process is highly competitive, as there are many more candidates than there are openings. In return, a member of the Forest Service obtains a secure job in a prospering enterprise, free accommodation and a vehicle (these days they drive Jeeps). The Forest Service salaries are well above the national average. It is hard not to notice a high level of camaraderie and loyalty to the profession among Polish foresters.

It is not possible to directly compare forestry practices in Poland to those in BC. In each place, the practices reflect realities (constraints and incentives) within which foresters must operate. Nevertheless, visiting forests in Poland could be a very educational and professionally stimulating experience.

Kris Zmudzinski, RPF, MBA, is the president of Las Consulting Inc., a harvest planning consultancy established in 1997, and based in Prince George. He is also an assessor of qualifications for the Canadian Federation of Professional Foresters Associations.

Landscape and Memory

Simon Schama
1996, Paperback, 652pp
Publisher: Vintage, Canada
ISBN-10: 0679735127
ISBN-13: 978-0679735120

Henry David Thoreau once said: "It is in vain to dream of a wilderness distant from ourselves. There is none such. It is the bog in our brains and bowels, the primitive vigor of Nature in us that inspires that dream. I shall never find in the wilds of Labrador any greater wildness than in some recess of Concord, i.e. than I import into it."

As forest professionals we have a strong attachment to landscape. A tour of British Columbia using Google Earth illustrates our impact on the forest landscapes over the past 100 years. We

> "Like a forest with all its complexity the book is an absolute feast for the mind.

diligently protect view sheds, maintain landscape connectivity and enhance landscape biodiversity. But how did we arrive at our landscape objectives? Why do we consider one forest scene beautiful while another promotes disgust? Would it not be enlightening to our professional practice if we had better self-knowledge about how we arrived at our perceptions of landscape?

Simon Schama, a British historian at Columbia University, takes the reader on a journey over the past few thousand years exploring the richness, complexity and antiquity of our cultural traditions with landscape. It is a journey that echoes the words of René Magritte in 1938: "This how we see the world...We see it as being outside of ourselves even though it is only a mental representation of what we see on the inside."

Ranking: 5 out of 5 cones

Dr. Schama argues that all landscapes are a reflection of common threads of human obsession passed through generations. Our "cathedral" forests are perhaps not only a pacific northwest cliché to lure eco-tourists but a consolation of something that will endure beyond our lifetimes. Why else would we plant trees to celebrate a birth, wedding or other important event?

We are constantly reminded by both the media and our critics that the forest manager's view of the forest is both "industrial" and mindless; not concerned with traditions but only with measurements and financially driven numbers. Simon Schama finds more examples of our deep veneration for the sacredness of nature than destruction. It is everywhere in our park, yards, and homes. The book does not obsess about how diminished our landscapes have become. Rather, it focuses on what we could lose if we do not celebrate our relationship with the land and share our personal stories.

"Even the landscapes that we suppose to most free of our culture may turn out, to be its product?" Would we rather have Stanley Park, with all its urban encroachment and heavy use, have never been?

Like a forest with all its complexity the book is an absolute feast for the mind. It is a hopeful book that encourages us to see the identified and preserved world with our eyes wide open. It is a dense read but worth the effort!

Reviewed by Nathan Paul Davis, RPF.

RESTORATION continued from Page 12

power of natural recovery, the natural processes model greatly reduces the cost of treatments and generally eliminates the need for costly maintenance or re-treatments. Allowing the established pioneering species to create conditions appropriate for subsequent species accommodation for changes in climate is built into the use of the natural processes model. Following natural processes creates ecosystems that are appropriate for the conditions of the area and the end land uses that might be applied.

David F. Polster, RPBio #148 is a plant ecologist with over 35 years of experience in vegetation studies, reclamation and invasive species management. He graduated from the University of Victoria with an honours bachelor of science degree in 1975 and a Master of Science degree in 1977. He has developed a wide variety of reclamation techniques for mines, industrial developments and steep/unstable slopes as well as techniques for the re-establishment of riparian and aquatic habitats. He is the past-president (third term) of the Canadian Land Reclamation Association. He is the treasurer for the BC Chapter of the Society for Ecological Restoration and serves as the alternate mining representative on the board of the Invasive Species Council of BC.

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The Legal Perspective

By Jason Herbert, LLB

Complementary Objectives:
Upholding the Public Interest and Advocacy of Good Forest Stewardship

Under the *Foresters Act*, the BC Legislature has entrusted the profession of forestry with the privilege to regulate itself, in the public interest, through the vehicle of the ABCFP.

In exchange for this privilege, as with other professional regulatory bodies in BC, the ABCFP assumes responsibility to serve and protect the public interest with respect to all matters within its regulatory mandate. This includes upholding the public interest through the exercise of authority over admission of members, establishment of standards, and investigation and resolution of complaints with a view to ensuring the competence, independence, professional conduct and integrity of RPFs and RFTs, and ensuring that each person engaged in the practice of professional forestry is accountable to the ABCFP.

However, the *Foresters Act* also recognizes that it is one of the objects of the ABCFP "to advocate for and uphold principles of stewardship of forests, forest lands, forest resources and forest ecosystems."

This differs from the statutory objects of other professional regulatory bodies in BC, whose governing Acts typically do not give them this kind of specific advocacy role.

In this context, the scope and content of the ABCFP's advocacy function is shaped by the ABCFP's public protection mandate and must be interpreted harmoniously with that mandate.

There is a fundamental distinction between a regulatory body like the ABCFP, whose duty is to protect the public interest, and a member association with a mandate of promoting the interests of its membership. The ABCFP's role is confined to public protection and does not extend to promoting members' interests.

For example, the purpose of council's authority to establish and enforce requirements for admission of members is not to protect members of the ABCFP from competition by other professionals. It is to provide assurance to the public that only those individuals determined to have the requisite education, qualifications and competence to engage in the practice of professional forestry as RPFs or RFTs are entitled to hold themselves out as RPFs and RFTs and to engage in the practice of professional forestry in that capacity.

There is also an important distinction between the ABCFP's duty to protect the interests of the public as a whole, as opposed to the interests of individual members of the public or particular constituencies (such as forestry companies, unions, etc.), which do not always coincide. The role of a professional regulatory body like the ABCFP is focused on the interests of the public as a whole in the promotion of competent, professional and ethical forestry practice by its members.

For example, the underlying purpose of the ABCFP's complaints resolution process is not to satisfy or serve the interests of individual complainants, but to investigate and address concerns about members' professional conduct or competence with a broader view to the interests of the public as a whole.

In light of these principles, the ABCFP must not act, and must not be seen to be acting, as an advocate for the purpose of promoting the private interests of its members. This would create a conflict with the ABCFP's public protection mandate under the *Foresters Act*.

Nor is it the role of the ABCFP to act as an advocate for the private interests of particular complainants, or other individual members of the public or particular constituencies.

This does not, however, prevent the ABCFP from engaging in the kind of advocacy that is specifically contemplated by the *Foresters Act*, for the purpose of promoting the interests of the public as a whole in good forest stewardship.

It is entirely appropriate for the ABCFP to engage in advocacy for this purpose, including advocating for government or industry to adopt policies or take other action with respect to forest management, if the ABCFP believes that such policies or action will promote the public interest in good forest stewardship.

This leaves open a number of unanswered questions to be considered whenever the ABCFP contemplates engaging in its advocacy function:

- What is "good forest stewardship," and does the content of the proposed advocacy relate to it?
- Is there a risk that the ABCFP will be perceived as advocating on behalf of its members, as opposed to the public interest, because of the content of the proposed advocacy?
- Could the proposed advocacy interfere with the ABCFP's relationship with government, or could it otherwise interfere with the ABCFP's ability to carry out its core regulatory responsibilities under the *Foresters Act*, because of the scope and content of the proposed advocacy and/or its intended audience?

It is important for the ABCFP's council to carefully exercise its judgment in considering these questions, with a view to avoiding any actual or apparent conflict between the ABCFP's advocacy function and the ABCFP's other statutory duties and objects, including its overarching duty to protect the public.

Jason Herbert is a partner at Davis LLP, where he has practised regulatory and administrative law for the past 14 years, and regularly acts for and advises professional regulatory bodies. He is currently co-chair of the Professional Governance & Regulation Practice Group in Davis LLP's Vancouver office.

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SMART continued from Page 10

actions and change course if needed. Both prescribed fire methods and objectives should be sufficiently flexible to respond to conditions on the site that were not originally anticipated. Both objectives and methods should be compared to a known end condition or reference site. A target condition/reference site is chosen by reviewing historic written accounts, photos, research data, field sample data and by reviewing similar monitoring and prescribed fire plans.

Once the objectives and monitoring plan are established the rest of the prescribed fire plan can be written in collaboration with wildfire management specialists and resource professionals. Since each prescription is site-specific, planning requires good science to achieve desired fire effects. With productive communication between the fire behaviour specialist and resource professional, a prescription is developed that defines the boundaries of the most ideal fire behaviour and weather conditions to burn within, so the prescribed fire objectives are safely achieved. Fire operation specialists are consulted to develop the ignitions, holding and contingency plans and also, to help identify operational boundaries, smoke management concerns and the resources required for prescribing the fire safely and efficiently.

Of course the details of prescribed fire planning go deeper than this article. There are plenty of planning resources and guidebooks available, as well as online post-secondary courses specific to prescribed fire for resource professionals that will allow them to continue learning and developing. For example, monitoring can be explored further via the *Fire Monitoring Handbook* or the *Fire Research And Management Exchange System* (FRAMES) website. With good understanding of fire ecology and science, respect for prescribed fire application and recognition of cooperation for implementation, we can be successful at writing feasible plans with SMART objectives and use prescribed fire as a tool to achieve land management goals in BC.

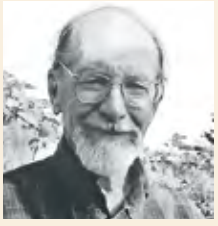
Colleen Ross is an RPF working as a Forest Protection Technician for the Wildfire Management Branch. She is an AFE wildland fire ecologist and is completing a Master's degree in natural resources, where her focus is on fire ecology and management.

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 members:

Rod (Roderick) Charles Pringle

RPF (RET) #619
1929-2013



Born in Vancouver, BC on February 26, 1929, Rod passed away in Victoria on January 3, 2013 in the loving presence of his daughter and grandchildren, who were greatly supported by his nephew Dan.

Rod started his career at the BC Forest Service and while stationed in Squirrel Cove, courted the local Lund school teacher, who would eventually become his wife. Rod and Colleen (nee Kealey) married in 1952 (60 years). They lived in Squirrel Cove, Alert Bay, Vancouver, Nanaimo, Britannia Beach, Burnaby, Vernon, Sidney and Victoria.

Rod was class president of the UBC BSF Class of 1957. Rod received his Registered Professional Forester status in 1970, retired in 1988 and was awarded a lifetime ABCFP membership for his contribution to the forestry profession. Rod worked for several forestry companies, as well as his own consulting firm, in various places in BC, including Vancouver, Nanaimo, Britannia Beach and Vernon.

Rod is survived by his much loved wife Colleen, son Rod, daughter Kealey and grandchildren Emerald and Kelt. He will also be missed by his sister-in-law Mary, nephews Dan (Jill, Erin and Annie) and Eric (Sandy and Owen) and niece Lisa Kerr (Doug, Geoff and Iain).

Rod had a quiet, charming and clever wit and taught others to be kind, loving, compassionate and gentle. Rod loved to spend time with his family and his family loved his company. He had many lifetime friendships and filled his spare time with gardening, sailing, playing bridge and being outdoors. Rod loved being in the woods and on the coast, especially in any boat. He built a nutshell pram (row/sail boat).

Rod was a person who believed in being involved in the community. Notably, he was a school board trustee in Vernon, the president of the BC Schizophrenia Society, and a councillor with the Association of BC Forest Professionals. Rod and Colleen were also members of a Unitarian Fellowship in Vernon.

Rod wrote, "I leave with gratitude for my life, loved ones and friends."

The family sends much gratitude to the Vancouver Island Health Authority paramedics and the nurses in the Intensive Care Unit at the Royal Jubilee Hospital. A service will be held in the spring.

Donations can be made to the Forestry Class of 57, University of British Columbia Alumni Fund. Condolences can be sent to: Kealey.pringle@gmail.com

Hugh John Goodman

RPF (RET)#526
1926-2012

Hugh passed away peacefully on May 21, 2012 in Quesnel, B.C. He is survived by his wife Mavis, sister Kathleen, daughters Enid and Nancy, sons Arthur and Eric and his eight grandchildren, Tennyson, Max, Katrina, Monica, Jackie, Billy, Tara and Emma.

Hugh was born in Prince Albert, Saskatchewan. In 1944 he volunteered for the Royal Canadian Navy. Upon his return Hugh undertook a degree in forestry from the University of New Brunswick and graduated in 1949. That same year, he married Mavis.

Hugh worked as a forester for Abitibi Power and Paper from 1949 to 1954 in Iroqouis Falls, Ontario. He then travelled to New Zealand to work as a forest engineer for Kaingaroa Lumber Pulp company from 1954 to 1957. He returned to Canada in 1957 and worked for the Department of Natural Resources in Prince Albert. In 1966 he came out west to BC and worked in forest planning and logging for Weldwood of Canada until retiring in 1985.

Even in his retirement Hugh remained actively interested in forestry. He most enjoyed conducting "forestry at work" bus tours for the public. In 1995 he became a Life Member of the ABCFP for his substantial contributions to the association and forestry practices in BC. In addition to his professional and personal accomplishments, Hugh will be remembered for having a great love for the outdoors, including hunting, fishing and cross country skiing.

Submitted by Eric Goodman, RPF

Membership Statistics

ABCFP—January 2013

NEW REGISTERED MEMEBERS

Sarah Jane Railton, RPF

NEW ENROLLED MEMBERS

Joanna Bernardo, FIT
Krista Leigh Blades, TFT
Taisa Louise Brown, FIT
Alexander Dean Burkinshaw, RFT, FIT
Danielle Stephanie Gnoyke, TFT
Hayley Erin Letchford, TFT
Martin Douglas Lewynsky, FIT
Blase Jordan Orchard, TFT
Marc Vincent Rowan, FIT
Li Tiefer Yao, TFT
Dylan Andrew Young, TFT

REINSTATEMENTS (REGISTERED MEMEBERS)

Ryan Richard Gremaud, RFT
Clayton Peter Neuner, RFT
Cindy Jane Verschoor, RPF

DECEASED

William R. Batten, RPF(Ret)

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

NEW RETIRED MEMBERS

David R. Clark, RPF(Ret)
Janet E. Gagné, RPF(Ret)
Norbert C. Greinacher, RPF(Ret)
Jerome S. Hunter, RPF(Ret)
Lester W. Vermiere, RPF(Ret)

LEAVE OF ABSENCE (REGISTERED MEMBERS)

Alan G. Barber, RPF(on LOA)
A. Paul Blueschke, RPF(on LOA)
Conrad Earl Browne, RFT(on LOA)
Gordon G. Catt, RPF(on LOA)
David L. Cooper, RPF(on LOA)
Grant Douglas Cummins, RPF(on LOA)
Dean A. Currie, RPF(on LOA)
Michael A. Dietsch, RPF(on LOA)
Rena Mary Gibson-Protzner, RFT(on LOA)
Stacey H. Gould, RPF(on LOA)
David Stephen Hall, RFT(on LOA)
Lisa E. Hanna, RFT(on LOA)
Linda Carolyn Harris, RFT(on LOA)
Dennis Arthur Heigh, RFT(on LOA)
Frank Peter Heller, RFT(on LOA)
Aaron B. Jones, RPF(on LOA)
Paul Douglas MacNeil, RFT(on LOA)
Gayle Caroline McMurray, RFT(on LOA)
Mark Messmer, RPF(on LOA)
Anne Margaret Molony, RFT(on LOA)
Keith Daniel Mullens, RFT(on LOA)
Pierre Andre Pelletier, RFT(on LOA)
Frank J. Rowe, RPF(on LOA)
Timothy Adam Singer, RFT(on LOA)
Shawn M. Switzer, RPF(on LOA)
Steven Donald Williams, RFT(on LOA)

LEAVE OF ABSENCE (ENROLLED MEMBERS)

Candace Paige Dow, TFT(on LOA)
Grant Kurt Huettmeyer, FIT(on LOA)

REMOVALS (REGISTERED MEMBERS)

William Allan Bablitz
Stephen Balsom
Leonard Mark Blayney
Lyle Marin Joseph Bonthoux
William Robert Brash
Michael F. Breisch
David John Burgess
Daniel S. Carson
Mark Edward Desprez
T. John Drew
Debora Lynn Erickson
Lee M. Fennell
Edward David Folk
Christopher Warn Franklin
Norman Robert Fraser
Darryl Brian Garcia
Richard Terry Green
Brett Gunn
Russell C. Haas
John E. Hall
William Laurits Henriksen
Renata Herrera
Kevin Jock Honeyman
Kevin R. Jewett
Kimberly Robyn Kaytor
Lloyd R. Kilback
Anthonie W.J. Knevel
Craig Konst
Matthew Chad Lantz
Kenneth Gary Larsen
Daniel Ernest Laurie
Bradford Monson Lingard
Sherri-Lynne Madden
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Laura K. Smith
Christian Hannes Spangl
Douglas A. Stables
Ricky Dirk Stock
Daniel S. Szekely
Robert John Tarry
Sugu Thuraisamy
Douglas Rutherford Turner
John R. Vinson
Lloyd E. Wilson
William Jason Wright

REMOVALS (ENROLLED MEMBERS)

Stefan Borbstaedt
Evan Denis Breton
Tsz Ching Horton Chiu
Raymond M.O. Cormier
Jordan Arthur De Graaf
Enrico Maria Goberti
Kevin John Heidt
Javed Iqbal
Taehee Lee
Timothy Alan Leeming
Stephanie Edna Rooke
Blake Ryan
Matthew Theophil Sawycky
Conal David William Shepherd
Aimee-Lee Dawn Warren
Deborah Lynne Webster
Scott William Wright

REMOVALS (ASSOCIATE MEMBERS)
Darryl Brian Garcia
Richard Terry Green
Kent Douglas Pincott

RESIGNATIONS (REGISTERED MEMBERS)
Alan R. Catto
Michael J. Girard
Grant J. Gunn
Richard Kimmerly
Jennifer Jo-Anne Lecuyer
Merva R. Lyons
Gregory J. K. Jones
Lana Elizabeth Wilhelm

RESIGNATIONS (ENROLLED MEMBERS)
Sheldon Patrick Connolly
Robert Douglas Conroy, RFT*
Laura Ashley Kurys
Raymond James Wiggins
Bryan Woodward

*active RFT, resigned FP

SLATE continued from Page 11

collected on site. Plant survival and growth were monitored after two and seven growing seasons.

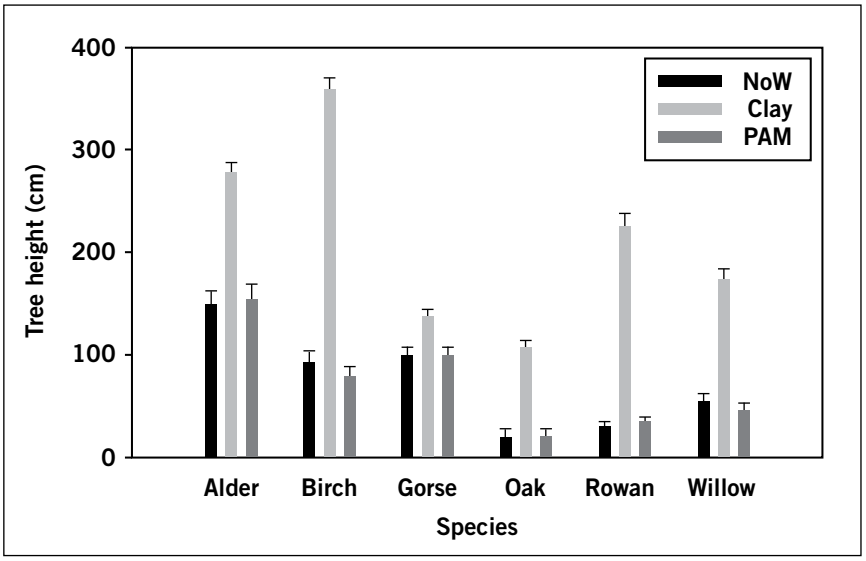
Stem basal areas measured after two years showed that neither increasing nutrient supply (with mineral fertilizer) nor water-holding capacity (with PAM gel) was sufficient alone to improve plant establishment. However, both boulder clay and organic waste amendment significantly enhanced plant growth. The growth of N2-fixing species (alder, gorse) was greater than non-fixers where additional N was not supplied, and the growth of pioneer species (birch, willow, alder) was greater than non-pioneer species with fertilizer, organic waste or clay additions. Organic waste addition had the greatest positive impact on soil processes.

The bar chart for tree heights measured after seven years shows that boulder clay significantly improved growth in all species compared with PAM gel or no water-holding (NoW) amendments, whereas the effect of fertilizer (mineral or organic) gave no such significant improvement over the no-fertilizer treatment (data not shown). Results strongly indicate that increased water-holding capacity provided the greater benefit to reclamation outcomes. Because the clay treatment was a 75 cm layer over slate waste and root extension, which was supported by the water-holding capacity provided by the clay, acquisition of additional nutrients (albeit extremely limited) beyond the three litre planting pocket was made possible.

Conclusion

This is an important result for industry as the quarrying of minerals often gives rise to a wealth of boulder clay or drift materials, the usefulness of which may frequently be overlooked. Boulder clay, on its own, was shown to be effective in establishing and sustaining growth of native woody species and similarly, would be expected to support the restoration of low- nutrient habitats such as acid grassland and heather moorland. Where a more rapid early establishment of trees is desired, clay amended with slow-release organic materials such as the biosolids-deinking paper blend could be used. This study has shown how sustainable this on-site asset actually is in reclamation strategies by providing a low carbon emitting solution.

Dr. Julie Williamson is a soil scientist at Bangor University, Wales, with 30 years experience of land restoration research and techniques that focus on the re-establishment of nutrient cycling processes and soil development.



Effect of water holding amendment on woody plant species growth in waste slate over seven years.

Further reading

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CoR continued from Page 14

Surface Reclamation

Surface reclamation is the next step of site restoration. For easily accessible lands, surface reclamation typically does not commence until the permit holder has received written acceptance of the CoR Part I application. This approach minimizes risk that the permit holder might be required to re-disturb a reclaimed site. For remote sites that are difficult to access, the permit holder will often complete surface reclamation of the site shortly after plugging the wellbore to minimize costs associated with access and equipment mobilization.

Surface reclamation requirements for Crown land are detailed in Section 19 of the *Environmental Protection and Management Regulation*. Requirements include stabilizing slopes, removing stream crossings, restoring drainage patterns, redistributing topsoil and re-establishing vegetation at the site with a Ministry of Forests, Lands and Natural Resource Operations-approved seed mix or propagules of an ecologically suitable species. In addition, individual well permits may have conditions that require replanting of commercial tree species or the use of native vegetation.

Surface reclamation requirements for land in the Agricultural Land Reserve (ALR) are detailed in Schedule B of the delegation agreement between the Commission and the Agricultural Land Commission. Approximately 21% of well sites are located on ALR lands.

When surface reclamation is complete, the site is assessed by a qualified professional who prepares and submits a reclamation inspection report with the CoR Part II application. Licensed professionals from the Commission review all submissions and make a statutory decision to issue a CoR if the submission is acceptable.

Restoration Verification Audit

The CoR process is based on professional reliance. It is expected that professionals submitting applications are working within their competencies and that the professional regulatory bodies will hold their members accountable for matters of conduct and competency to serve and protect the public interest.

In 2012, the Commission implemented a Restoration Verification Audit Program to help determine if site restoration requirements under OGAA are being met. This was accomplished by selecting 10% of certified sites and conducting reviews of files and submitted documentation as well as field verification. The audit program focused on CoR Part I applications and the evaluation of potential residual contamination. Results will be available in 2013.

Devin Scheck, P.Ag, is the director of waste management and reclamation with the BC Oil and Gas Commission and has 14 years experience in environmental investigation, reclamation, assessment, permitting, and regulation of upstream oil gas activities.

Akbar Khan, PhD, P.Ag, PEng. has been a waste management officer with the BC Oil and Gas Commission since 2007 and has over 20 years experience in site restoration in BC and Arizona and as an innovative farmer.

KARST continued from Page 18

handful of surface remediation projects to date have met with limited success, or have caused further disturbance with no net benefit. In most cases, it is much easier and more cost-effective to avoid impacts to these sites beforehand. Where forested karst landscapes have been harvested previously, the need to assess and manage for cumulative effects of logging has important implications for future timber supply.

Forest professionals undertaking industrial forest activities or remediation of karst resources should consult with or engage competent karst scientists and/or qualified karst resource professionals. Prospects for rehabilitating damaged karst resources require case-by-case evaluation by professionals with advanced education in a related scientific field, preferably karst science.

Costs of preventive karst management may include professional assessments, pre-emptive treatments such as windfirming and supplemental training and supervision as needed. Prevention benefits may include avoiding legal penalties and remedial orders and the maintenance of karst ecosystem function, site productivity and stewardship reputation. Restoration costs may include additional labour, equipment, materials and possible ongoing maintenance. Restoration benefits may include compliance with remedial orders and re-establishment of karst ecosystem function, site productivity and stewardship reputation.

The BC Forest Practices Branch provides overviews of karst and web links to provincial karst inventory and vulnerability assessment methods, recommended best management practices, monitoring and recommended minimum qualifications for karst resource professionals. See http://www.for.gov.bc.ca/hfp/values/features/karst/index.htm. Accessed December 31, 2012

Acknowledgements:

The input from members of the BC Karst Science Panel in the preparation of this article is acknowledged, as is a review of drafts by Bob Craven, RPF, Manager, Forestry Operations, Interfor Coastal Woodlands.

Paul has been an independent consultant specializing in karst for more than 30 years. His karst experience spans more than 40 years, and includes investigations and observations in seven Canadian provinces and territories, 11 American states and territories, and 17 other countries. He is currently completing his PhD in karstology.

WIN—WIN continued from Page 15

(by girdling or mechanical topping) to enhance habitat.

In hardwood-dominated riparian systems, the conversion from hardwood to conifer forests is occasionally used to meet restoration objectives. In areas suitable for conifer growth, patch cuts of up to 1 ha with a 7.5 m no harvest inner zone are created and reforested with a mix of site-adapted, large bare root conifer seedlings to escape animal damage and brush competition.

To make riparian restoration a win-win situation, it needs to provide ecological benefits, while also being economically feasible, practical and efficient. Restoration treatments present opportunities to generate revenue from approximately 33% of the estimated riparian land base that are otherwise treated as reserves. Several key considerations are:

1. Riparian restoration should be a site-specific optional treatment that is based on ecological need yet provides a positive economic return. Treatments range from the removal of small-diameter conifer trees (chip wood logs) and large diameter saw logs to the selective removal of valuable transmission poles.
2. Riparian restoration activities are conducted in conjunction with adjacent upland operations that require the same type of harvesting equipment. The smaller the difference between the upland and riparian activity regarding operations and products, the more likely the activity can be accomplished. Upland thinning treatments, including RMZs, are generally operationally efficient because extensive buffer measurements can be avoided.
3. Assessment, documentation and procedural requirements need to be kept to a minimum so valuable forest professional time is not disproportionally spent on projects with lower economic returns.

To date, the implementation of riparian restoration has been limited to riparian forests with gentle topography, easy accessibility and merchantable forest products. It will continue to be used only on a small percentage of the riparian land base and contribute to the diversity across the landscape. Thinning in the stem exclusion phase of stand development is a low-risk approach that has overwhelming support in the scientific literature (Dodson et al. 2012; Davis et al. 2007) as a primary tool for habitat enhancement. Combined with the creation of dead wood, restoration treatments accelerate stand development by decades while producing desirable forest products. A win – win!

Florian Deisenhofer works as the regional silviculturist for the Department of Natural Resources in southwest Washington, USA. He consults a staff of foresters and oversees silvicultural prescriptions for approximately 210,000 ha. He co-authored the Riparian Forest Restoration Strategy for western Washington's state-managed forest lands.

GRASSLAND continued from Page 13

to cause soil scorching and subsequent invasive plant infestation if left onsite (piled or uniformly distributed) and burned in spring. It would also present increased fuel-loading and risk of wildland interface fire if left on site over summer. We elected, therefore, to remove most of the debris to the landing to be ground up and shipped to the Atlantic Power thermal generator in Williams Lake. A major amendment to the Forest Stewardship Plan created new stocking standards for grassland and open range to support the intention to not reforest the site after harvesting.

For the most part, hand falling and slashing were done simultaneously on snow and frozen ground. Debris effectively armoured the ground and allowed the grapple skidder access to most areas in a manner that spread out activity and prevented soil disturbance. A grapple loader and forwarder were used to move the slash. Future restoration of densely treed grasslands could utilize a processor/forwarder/loader team for the entire operations phase such that the processor could cut, sort and pile non-merchantable stems during the first pass in a manner that would facilitate pick-up by the forwarder and ultimately reduce the number of machine passes required to clear the restoration area.

A prescribed burn of the site was conducted to remove fine fuels in the spring following the harvest. While the burn succeeded in this regard, it also consumed some of the large woody debris intended for retention and scorched around the bases of the retained Douglas-fir where litter accumulation had been deep (despite raking beforehand). Those places were quickly invaded by non-native plants. The balance of the grassland area did exhibit grass growth and reestablishment; grassland forbs that had never been seen at that site bloomed in profusion (see photo sequence).

The Alex Fraser Research Forest continues to learn from this project as time goes by. It serves as an easily accessible demonstration site for students and professionals alike. If interested in further details, please contact the Research Forest.

Cathy Koot, RPBio, practises applied biology and coordinates research projects on the area-based tenure of the University of British Columbia's Alex Fraser Research Forest at Williams Lake, B.C.

A Moment in Forestry

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

Steam Donkey Submitted by Berry Wijdeven

Known as a steam donkey, this steam-powered logging engine was created in the late 1800s to drag logs out of the forest.

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