

BC

Forest PROFESSIONAL

SPRING 2023

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Keys to Improving Forest Recovery Post-wildfire

Tangible Climate Change Adaptation
Strategies and Actions

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ABC FP 2023
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Harrop Creek resilience fuel treatment, one year after partial cut. Photo credit: Erik Leslie, RPF.

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Forest Professionals British Columbia and *BC Forest Professional* magazine acknowledge our province is located within the traditional territories of Indigenous Nations.

Public Voices in Forest Landscape Planning

The Government of BC is replacing forest stewardship plans with forest landscape plans, starting with four pilot processes in collaboration with First Nations and with input from communities and the public. Government has recognized it should take more responsibility in managing BC forests by establishing clear and measurable objectives and developing a collaborative vision of the planning area forest landscapes.

Forest landscapes are not static and change over time from natural disturbances and human intervention. Landscape disturbances have been amplified with recent climate induced events. These areas are our home, where we make a living, recreate, and — for many — they provide spiritual solace. Therefore, it is important to have a public process open to all members in the community and not limited to sectoral representatives in developing forest landscape plans that are adaptive and can accommodate periodic change. I have outlined below some factors for an effective public participation process:

1. Clear process rules.
2. A process that is open to a wide range of community voices. This can be enhanced by using different meeting locations, weekend dates and evening meetings, and allowing paper and electronic

submissions. Creation of a website to report planning progress and a portal for community feedback is a necessary part of an open process.

3. An educational component consisting of local and technical information that is available at meetings and on the process website.
4. Communication that clearly indicates how public input was considered in the decision-making process with web posted meeting notes. There must be transparency throughout the process to plan approval by the chief forester that includes rationale for landscape planning decisions.
5. Creation of measurable objectives so forest landscape plans can be adjusted at public forums.

The Government of BC has taken control of forest management through forest landscape planning on behalf of British Columbians and recognized the need to include First Nations, communities, and the public in this process. Effectiveness of forest landscape planning in creating measurable objectives by including First Nations and public voices has yet to be determined.

Leslie Hawkins, RPF(Ret), MSc

Write us!

The *BC Forest Professional* letters section is for readers responding to recent articles and for brief statements about current FPBC, professional, or forestry issues. The editor reserves the right to edit and condense letters. Letters must adhere to standards of fairness, accuracy, legality, and civility. Anonymous letters are not accepted. (Maximum word count: 300.)

For detailed submission guidelines, please visit fpbc.ca for more information.
Email letters to: editor@fpbc.ca

Rising to Today's Challenges Requires Good Leadership and Peer Support

Our recent 2023 forestry conference and AGM had me recalling

my first forestry conference when I was an inductee. I looked around the room at my new professional colleagues and did not appreciate the forestry family I was now a part of. When I reflect on my career since that day, I think about how I have been supported along the way and how we need to ensure our registrants are enabled and confident to take on the challenges in front of us.

I became a Registered Professional Forester in 2001. The jobs I've had throughout my career have ranged from field work, writing prescriptions and professional reports, and supervising teams to executive positions — every one of them has been part of the practice of professional forestry and in every one of them

I have had someone who mentored and supported me along the way. Some of the jobs involved reserved practice, so I needed to stay registered. Others, like the one I have today as an executive, don't typically trigger reserved practice but do fall into regulated practice of professional forestry and I choose to stay registered because it's important to build public trust, and because I am proud to be a professional.

I've had the opportunity to take on the challenge of a variety of roles in consulting, industry, and with the BC Public Service. As a result, I grew personally and professionally. However, I didn't do it alone; no one can. When I started as a forest professional, I didn't know what opportunities were out there. I was a young forester just trying to get a job and gain experience.

What it took was my willingness to take on new challenges and opportunities and lots of support from others — people I call mentors. The title of mentor isn't something you give yourself, you have to earn it. Others name you mentor.

Who was your first mentor? Mine was Frank Gunderson — 'Frankie G' my sponsoring forester — an RPF no longer with us. He was my first supervisor and supported every one of the forest professionals who worked for him and around him. He was a mentor to many people during his career. I have others who I call my mentors who I met early in my career. They have been mentors by guiding me to opportunities, investing in my development, giving me confidence, and listening and providing advice.

We are in a dynamic time in the world of forest management; changing climates, forest health challenges, more severe natural disasters, economic swings, and the effects of the AAC fall down. On top of what is changing in the forest, social demands are growing, expectations are higher, and public scrutiny of how forest professionals manage the land base has increased.

Rising to those challenges requires good leadership and support from peers. It also requires us investing in future forest professionals and those in the early stages of their forestry careers just as others invested in us. Share your stories, share your experiences, be there to help and provide advice.

Amid this changing forest management environment, those of you early in your career have a wealth of opportunities ahead of you. But you can't do it alone. Invest in yourself; seek out support from your peers; listen to their stories and ask questions.

We tend to get too caught up in the here and now, the emails in front of us, and what's happening today or tomorrow. Pause and think about what you could do to invest in a future forest professional, how can you make that impact on them like others did for me and you. Support a trainee or new forester by giving them support, learning opportunities, and the time and space for them to learn, study, and complete their requirements and become professionals.

So, I leave you with this charge: join me in supporting and coaching others, earn the name mentor, and grow the future forest professionals we need to manage our forests. ✪



Answers to Your AGM Questions

During the February AGM in Prince George, we received 161 questions with 3,185 up-votes in response to the CEO's business report, the director of finance's financial report, and the compliance and practice reports. Sadly, most of those questions were unanswered. While I can't respond to every one, questions have been paraphrased and grouped to answer as many as possible in this column.

▶ **The 2023 registration fee increase was huge. What has been done to reduce expenditures, and will the organization commit to a freeze on future increases?** The increase was needed to address significant new costs associated with operating under the *Professional Governance Act* and declining revenue. As a non-profit organization, we do everything we can to keep registration fees

as low as possible. Before proposing the increase, we generated more than \$1.1 million in new non-fee based revenue, and saved more than \$350,000 in year-over-year operating costs.

Setting aside inflationary increases, there are no further major fee increases planned for 2024 or the near future; we continue to work on other ways to address declining revenue and rising costs.

▶ **Would moving the Vancouver office and halting delivery of BCFP magazine reduce operating costs?** We currently lease a class C office space; the lowest class of office space. Including rent, property tax, and building operating costs, we pay about \$150,000 a year for office space, which is five per cent of our annual operating costs. On multiple occasions, finance committees have considered the pros and cons of changing the geographic location of the office; comparing costs with offices in other centers such as Prince George, Nanaimo, or Kamloops. Consistently these detailed reviews found no or negligible financial benefits, and would cause significant negative business operation and staffing impacts.

Moving BCFP magazine to an online-only publication could save up to \$65,000 per year and is under consideration. This change is easier with our new website but will need to wait until other information technology platforms are updated in 2023 and 2024. Notably however, a 2022 survey of registrants found that 70 per cent prefer a print edition of *BC Forest Professional*.

▶ **What are we doing to better understand why trainees are not completing their requirements and how to support them? What per cent of lost trainees are FITs/TFTs vs ASFITs/ASTFT?** About 62 per cent of trainees who left in 2022 were allied science trainees (ASFIT/ASTFT). This means fewer trainees with education credentials from an accredited forestry program left. There was little difference between the number of aspiring forest technologists and professional

foresters who left in 2022 (53 per cent and 47 per cent respectively).

Trainee resignations are mainly attributed to people finding work in other sectors and no longer needing registration. However, we continue to survey trainees to understand their reasons for leaving and seek feedback from trainees using our learning management system. We are working with our national partners to improve the credential assessment process (CAP) allied science trainees undergo, and sought government grants in 2022 to develop challenge exams to help BC trainees complete the national CAP process.

▶ **How is FPBC addressing situations where we have people in positions that previously required an RPF/RFT but are filled with incumbents who are not professionals?** The fee increase has allowed us to hire additional staff to address concerns regarding practice and title infringement, as well as work on proactive compliance strategies with employers. We contact employers who post jobs that are the practice of forestry but do not require professional forestry registration. Most adjust their job ads. We are creating communication products for employers to better explain professional forestry practice and how to meet the law. We are working on a risk assessment to identify employer groups and workplaces likely involved in professional forestry practice but potentially non-compliant with professional registration requirements so we can have informed discussions with employers to support them in ensuring their operations are compliant.

▶ **What was the overall cost of the name change?** Costs were primarily for graphic design, which was approximately \$11,000. The research was undertaken by FPBC staff and external advice on marketing and branding was acquired free of charge. Transition to the new name and logo will be phased in, meaning we won't actively replace and rebrand everything at once. Instead, we will incorporate new branding as products and materials age and are due for replacement.

▶ **Have you considered adding a non-practising registrant category to stop the loss of registrants who want to belong but don't actively practice?** We launched a non-practising category at the outset of 2023. More information will come later this year. In the interim, you can learn more about the new category on the "Status and Name Changes" webpage in the registrant portal or contact registration.

Thanks again to everyone for the active participation in the 2023 annual general meeting. A webinar recording with more answers to AGM questions, as well as additional Q&A with the CEO, registrar, and director of finance is now available on the FPBC website. ✪



Moving Beyond “Association:” New Name, New Website

The launch last month of our new website, fpbc.ca, completes one of the largest steps towards rebranding the ABCFP as Forest Professionals British Columbia.

While the legal name will continue to be Association of BC Forest Professionals, the change to Forest Professionals British Columbia is the latest in our evolution under the *Professional Governance Act* (PGA) from a dual mandate regulatory/membership organization to one with a more singular focus on our professional regulatory mandate. The new name will sharpen our identity and emphasize that professional forestry is a regulated profession and that its governing body is not a lobbyist or advocacy body for the profession's members.

Despite being a professional regulator since 1947, having “association” in the name of the organization has over the years led to a blurring and misunderstanding of the ABCFP's role. It has caused confusion for both registrants of the profession and the public at large. Many people assume the ABCFP is a private club designed to provide benefits to its members and protect member interests, or an independent group under the *Societies Act* that seeks to recruit members — not a regulator responsible for protecting the public interest in the practice of professional forestry.

With the PGA coming into force in 2021, the ABCFP was directed to prioritize and emphasize its role as the regulator for forest professionals, and to downplay or move away from the activities formerly carried out as a “member association.”

Consistent with this direction, the PGA has changed the use of the term “member” to “registrant,” and increased the number of public (lay) members appointed to council and statutory committees.

In 2023, more terminology shifts directed by the provincial government will also take effect; shifting the term “council” to “board,” and “president” to “chair.”

Watch FPBC Forestry Conference and AGM Sessions

More than 2,000 forest professionals participated in the three-day, hybrid 2023 FPBC forestry conference and AGM, held February 8-10.

The sold-out in-person event, at the Prince George Conference and Civic Centre, featured 13 separate professional development sessions including the AGM and a range of key forestry topics such as climate change, wildfires, forest hydrology, prescribed burning, forest carbon, and forest landscape planning.

Conference registrants can continue to access all the sessions on the EventMobi virtual platform until May 12 by logging in with your conference access code.

A recording of the AGM is available to all registrants on the FPBC YouTube channel.

Two New Registrant Candidates Elected to 76th FPBC Council

Derek Burdikin, RPF, and Janice Mathers, RPF, were elected as registrant councillors-at-large on the 76th Forest Professionals British Columbia (FPBC) Council.

The two were elected in the online council election held between December 7, 2022 and January 9, 2023.

Burdikin and Mathers will join Dave Clarke, RPF; David Gill, RPF; and Sally Sellars, RPF, as councillors-at-large.

Jamie Jeffreys, RPF, formerly the FPBC vice-president, takes over as president of the 76th Council.

Garnet Mierau, RPF, becomes past-president.

Kelly Kitsch, RFT, previously a councillor-at-large, is the new vice-president.

The 76th Council also includes four government-appointed councillors: Alison Dempsey, LLB/JD, LLM, PhD; David Morel; Wendy Royle, CPA, CA; and Kalpna Solanki, CPHI (C), BSc, MBA.

The 76th FPBC Council took office during the annual forestry conference and AGM, held February 8-10 at the Prince George Conference and Civic Centre.

2022 ABCFP Annual Report Available at fpbc.ca

The complete 2022 ABCFP Annual Report and Financial Statements are available on the new website at fpbc.ca.

The 2022 annual report provides an in-depth look at the year in review, including information and statistics on the number of and categories of registrants, complaints and discipline, financial statements, and key work products accomplished in 2022.

The report also includes complete lists of all committees, volunteers, and award recipients.

Tax Time: Your FPBC Annual Dues May be Deductible

If you require your professional designation to do your job, and you pay your annual dues out of your income, you can claim that amount on your income tax return.

Like many deductions, expenses related to annual professional dues can be deducted dollar for dollar from your annual income, without limit. This means you do not have to pay any income tax on the amount equal to your dues.

For more information on claiming your professional dues, visit the CRA website.

BILL 22 REVISITED: The Risks of a Change of Control

Technically, “Bill 22” refers to the *Forest Statutes Amendment Act*, 2019, brought into force May 30, 2019. In much the same way that — in spite of its technical meaning — “Bill 13” became a colloquial reference to the *Timber Harvesting Contract and Subcontract Regulation* and related provisions of the *Forest Act*, “Bill 22” has similarly come to collectively refer to those provisions in Part 4 of the *Forest Act* that regulate forest tenure transfers in BC (“Part 4”) and the related *Disposition and Change of Control Regulation* (the “Regulation”). While both Part 4 and the Regulation were substantially amended as a consequence of Bill 22, neither is, in fact, the actual “Bill 22”.

Part 4 of the *Forest Act* has always regulated forest tenure transfers in BC in one way or another. With Bill 22, Part 4 now includes a requirement for ministerial approval of a tenure transfer, and two legal “tests” that further guide the Minister’s decision whether to approve a particular transfer. The first test considers the “public interest,” and the second test considers whether the transfer is “detrimental to competition” in the marketing of fibre in BC. While the “public interest” is a matter left entirely to the Minister’s discretion, the Regulation was amended to include further standards to assist the Minister’s determination of whether a proposed transfer is detrimental to competition. In this respect, the Regulation now includes a “concentration test” designed to assess the effect of a proposed transfer on the concentration of timber harvest rights, and a “consumption test” that assesses the amount of fibre an owner of a timber processing facility is required to obtain through sources other than the owner’s forest tenures.

If the Minister concludes that a proposed transfer is not in the public interest or is detrimental to competition in the marketing of fibre, the Minister “must not” approve the transfer unless the approval includes conditions that remedy the Minister’s concerns. Such conditions could require the purchaser of the tenure to transfer other tenures that it holds to an arm’s length party.

Jeff Waatainen has served as an adjunct professor of law at UBC, practised law in the forest sector for over 25 years, and works with the Forestry Law Practice Group of DLA Piper (Canada) LLP’s Vancouver offices. This column is in the nature of general commentary only, and is not in the nature of legal advice or opinion.

Ministerial approval is a pre-condition to a tenure transfer — any transfer without ministerial consent is “without effect.” So, if there are conditions attached to a ministerial approval that are unsatisfactory to the parties, they can pick up their ball and go home and decide not proceed with the transfer.

More interesting are circumstances when two parties agree to a purchase and sale of a company that holds a forest tenure, rather than to a purchase and sale of the tenure itself. Such “changes of control” of corporate forest tenure holders are also regulated under Bill 22, but the regulatory process is not triggered until after completion of the transaction. Under Bill 22, once a change of control of a corporate tenure holder has completed, the corporation must notify the Minister who then initiates a review to assess the implications of the transaction on the public interest and competition in the marketing of fibre. As with a straight-up tenure transfer, the public interest is entirely a matter for the Minister’s discretion, and the “concentration” and “consumption” tests will apply to assess whether the change of control is detrimental to competition in the marketing of fibre.

If the Minister determines that a change of control is not in the public interest or is detrimental to competition in the marketing of fibre, the Minister may take “administrative action” against the corporation that could include, among other things, a requirement for the corporation to dispose of the tenure at issue to an arm’s length party, or acceptance of a “proposal” made by the corporation. With respect to the latter, the corporation may propose to transfer one or more tenures held by the corporation to an arm’s length party. If the corporation does not dispose of a tenure as required by the Minister or as contemplated in a proposal accepted by the Minister then, ultimately, the Minister may cancel the tenure at issue.

The point is that parties who pursue a change of control of a corporate tenure holder will not know the results of the Minister’s review or what is acceptable to the Minister until after the fact once it’s too late to back out. There is no mechanism for an “advanced ruling.” For this reason, straight-up tenure transfer agreements appear less risky than agreements that change control of a corporate tenure holder. ☺



KEYS TO IMPROVING FOREST RECOVERY POST-WILDFIRE: The Critical Roles of Proper Planning, Implementation, and First Nations' Collaboration



Retained area of western larch after fire salvage harvesting in Mica Creek region.

Photo credit: Peter Flett, RPF.

This article is a follow-up to *Incorporating First Nations' Values for Forest Recovery Post-wildfire* by Dan Macmaster, RPF, published in the Spring 2022 edition of *BC Forest Professional*.

While walking through a dense forest in southern BC — in

preparation for a wildfire risk reduction project — an Indigenous Elder explained the relationship we have with the land is not one-sided; we can only take so much before it stops providing the values we rely on. We must give back and respect the *tmix*^w. In the *Syilx Okanagan* language, *nsyilxcən, tmix*^w refers to all living things and is at the centre of a way of living and thinking, where all living things are connected and rely on one another to thrive. Too often this principle is unfamiliar, forgotten, or misunderstood.

For Vaagen Fibre Canada (Vaagen), a family-owned non-tenured sawmill in Midway, located 45 minutes east of Osoyoos in the Boundary region, this principle was top of mind, and the partnership with the Osoyoos Indian Band (OIB), deeply valued. Hence, incorporating the OIB's values for forest recovery was crucial in the planning of the salvage and restoration work following the catastrophic wildfire dubbed the Nk'Mip Creek Wildfire.

In the months following the wildfire, Vaagen and the OIB began working together to assess the burned areas within the OIB's traditional territory, bearing in mind the potential impacts of intervening with management activities and leaving the *tmx*^w*ulax*^w (land) to recover naturally.

Through discussions with the OIB, areas were prioritized for management, and with proper planning and implementation, OIB and Vaagen accomplished numerous environmental, economic, and social benefits aimed at removing safety hazards in areas frequently used for food collection and recreation, preserving wildlife values, accelerating recovery in sensitive ecosystems, providing employment to Band members, and adding value to low-value or marginal wood to generate revenue.

The Method and Implementation

Prior to any machines entering the recovery sites, all blocks were reviewed by OIB referrals staff to assess the potential for cultural values and historical use and occupancy. A desktop review and preliminary field reconnaissance were completed for all blocks by an archeologist and OIB technician, which led to areas being removed from the salvage plans. After this, ongoing communication with Chief and Council was established to provide updates and address

any concerns brought forward by community members. Notifications were also provided through the OIB to inform locals of the upcoming activities.

A thorough walkthrough of each block was conducted by the Nk'Mip Forestry crew and OIB community members, including hunters, gatherers, and ranchers. The purpose was to collaborate with as many parties as possible in the early stages of planning to draw on local and traditional knowledge. For example, on a proposed salvage area walkthrough,

two OIB hunters identified an area of high use for elk that created a sheltered corridor to lower elevation sources of water. They also pointed out decaying stumps that housed insect colonies and provided important sources of food for local bird species-at-risk. While the features were easily identified by the OIB members, they were easy to miss for a development crew unfamiliar with the territory. As a result, the areas were removed from the salvage plans to preserve the wildlife features. In another walkthrough, a lone raspberry bush that survived the fire was identified and a protection zone was implemented to ensure it would not be disturbed during forestry operations.

At the onset of planning discussions with the OIB, it was emphasized that with the widespread disturbance to the landscape, it was essential to protect water and all vegetation that survived or had a good chance of surviving the fire. This meant that salvage efforts would focus on the most severely burned stands, followed by moderately burned stands with a high percentage of mortality. Unburned or low-severity burn areas would be avoided. Riparian reserve zones were implemented on all drainages, and soil erosion prevention measures were implemented for development and operations, such as working on frozen ground, avoiding steep ground,



Log deck of severely burned ponderosa pine and Douglas-fir after the 2021 Nk'Mip Creek wildfire. Photo credit: Peter Flett, RPF.

Peter Flett, RPF, is a planning, operations, and silviculture forester with Vaagen Fibre Canada, Osoyoos Indian Band, and West Boundary Community Forest. He holds a Master's degree in Sustainable Forest Management from UBC and focuses on strengthening relationships with First Nations and stakeholders. He is a director for the Phoenix Interpretive Forest Society and a member of the BC Community Forest Association Old Growth Working Group and Boundary Woodlot Association.

Continued on Page 22

CLIMATE CHANGE ADAPTATION: Let's Make it Real

Climate change projections and risks have been widely discussed in broad terms for many years, but climate adaptation principles have generally been weakly integrated into operational forest management decision-making. Real world examples of systematic climate change adaptation efforts in the forestry sector are sparse. There has been progress in the field of reforestation silviculture, but beyond such initiatives as climate-based seed transfer, management actions have been limited.

Why is there lots of theory but not much action? I think there are several reasons, including the firehose of climate information that often seems to increase our sense of uncertainty rather than provide clear direction or helpful tools. I have spent over a decade trying to figure out how to integrate climate change adaptation and mitigation into my work as a forest manager, and after much deliberation and consultation with my peers, I am convinced that there are practical ways to move forward. It is time for operational forestry professionals to engage and inform the high-level discussions and theories about climate change adaptation.

Project History

In 2010 and 2011, I attended a series of workshops delivered by the West Kootenay Climate Vulnerability and Resilience Project.¹ The workshops were designed for forest managers. We received a compelling overview of climate projections for the West Kootenays, and discussed adaptation principles, opportunities, and barriers. During the final workshop, participants were asked to step forward to try to operationalize the project's findings in our local areas. I put my hand up. As the manager of a community forest that was already commit-

ted to ecosystem-based management and innovative practices, I was fortunate to have a mandate to engage in this work.

In 2016, Harrop-Procter Community Co-operative (HPCC) and Columbia Basin Trust (CBT) provided funding for a multi-year project to develop a detailed case study to demonstrate how climate science and risk assessment could be integrated into tangible forest management decision-making on the ground. The project would have an applied focus and be oriented to the needs of forest managers.

The West Kootenay Climate Adaptation in Action project is based on the premises we have enough science to act and we have enough high-level direction to proceed.² By focusing on a specific 11,300 hectare landbase, and a decision-making time horizon of 20 to 40 years, the level of uncertainty is reduced significantly. The uncertainty associated with climate adaptation is often related to complexities inherent in trying to simultaneously understand and manage large diverse landscapes. Also, extended time frames of 60 to 80 years are important to consider but can confound management actions. Shorter-term management imperatives are evident in a small landscape which is already experiencing warmer and wetter winters and hotter and drier summers.

To ensure the project was strongly linked to regional climate expertise and offered practical value, I assembled a project advisory committee. The advisory committee included regional experts and consulting ecologists; Ministry of Forests' district and regional staff; and representatives from small, medium, and large forest industry. I developed and implemented the project myself to ensure a direct connection with real world management decisions. Invaluable GIS support was provided by Tom Bradley, RFT, to undertake the analysis for Phase 1 and Phase 3 of the project.

Phase 1: Risk Assessment

In phase one of the project, we used a systematic risk assessment approach to prioritize areas for adaptation actions. The current probability (relative likelihood) of wildfire and drought was assessed for each stand in the community forest based on terrain, ecosystem classification, vegetation resource inventory, and LiDAR

Erik Leslie, RPF, is a forestry consultant and manager of the Harrop-Procter Community Forest near Nelson. He has worked for 25 years with the forest industry, Indigenous Peoples, community organizations, and governments on projects from Haida Gwaii to Labrador. Erik has extensive experience in forestry planning and operations, community engagement, and wildfire risk reduction.



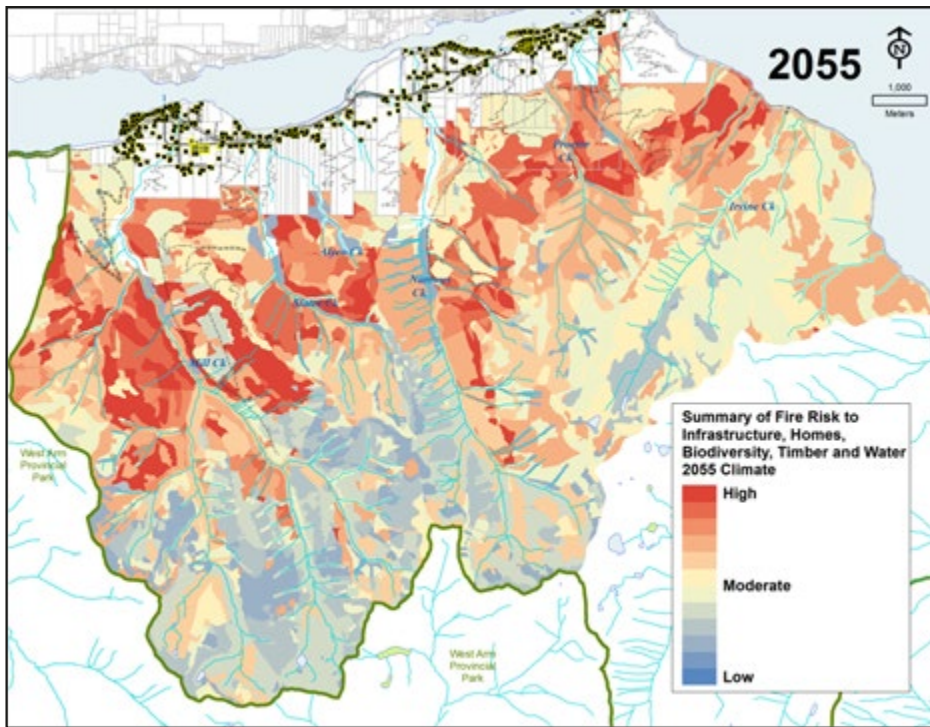


FIGURE 1. Risk assessment summary map—2055 climate.

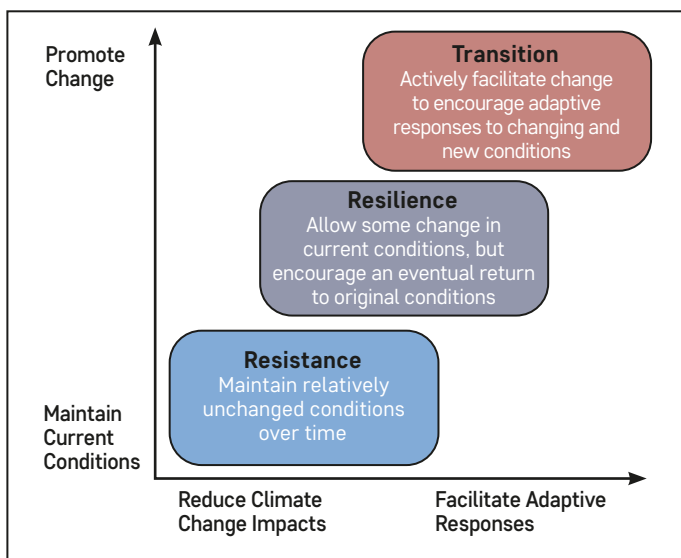


FIGURE 2. Adaptation options, from Nagel et al 2017.⁷

interpretations. Fire and drought probabilities were reassessed for 2055 and 2085 climates using provincial climate data and modelled changes to actual soil moisture regimes⁹ for each biogeoclimatic subzone variant and site series.

The consequences of fire and drought to homes, water, biodiversity and timber were also independently mapped. By combining probabilities and consequences, relative risk ratings were assigned and highest priority areas for adaptation action were identified (Figure 1).

Phase 2: Operations Strategy

The risk assessment identified top priority areas for adaptation actions. The next step was to identify specific adaptation strategies

OPERATIONS STRATEGIES

Resistance (protect)	Realignment (transition)
• Construct fuel breaks	• Convert forest composition and structure
• Protect old forests and rare sites	• Novel stocking standards
• Connectivity – reserves	• Connectivity – treatments

FIGURE 3. Examples of resistance and realignment strategies.

to address the risks. To organize our strategies and techniques, we considered a gradient of adaptation strategies, ranging from resistance to resilience to realignment/transition.⁴ We can choose to act defensively to maintain current conditions and resist undesirable change; we can accommodate some change and promote resilience; or we can proactively facilitate change through a realignment/transition strategy (Figure 2).

We chose site specific adaptation strategies for each forest type based on priority values, landscape context, current site conditions, and an assessment of desired future conditions. If the current forest conditions are similar to desired (and feasible) future conditions then a resistance or resilience strategy is likely to be chosen. However, if current conditions represent a high risk and are incompatible with desired future conditions, then a realignment/transition strategy is likely to be chosen. For example, developing fuel breaks around high risk values is a resistance strategy, whereas tree species conversion to drought-tolerant species is a realignment/transition strategy (Figure 3). In practice, these strategies can overlap and be complementary or sequential.

Once a resistance/resilience/realignment decision is made, an operational technique is chosen. HPCC's operations techniques include identifying priority reserve areas (resist), locating strate-



Underplanting as a Reforestation Strategy

Planting trees beneath a fire- or insect-killed overstory is known as *underplanting*. While both fire- and insect-killed stands have been underplanted in BC, survey results show that seedlings do much better under a fire-killed overstory than under an insect-killed overstory. Therefore, underplanting is generally not recommended for insect-killed stands because low light levels and competition from shrubs and grass result in poor microsites for seedling growth. Survival increases in fire-killed stands when seedlings are planted near the base of dead trees or other obstacles to provide shade and frost protection.

The underplanting technique works best for areas denuded by wildfire within the last 10 years; non pine leading stands where natural regeneration is less likely to occur; open stands in which planters can walk and plant through; and relatively stable snags where overhead dangers can be mitigated through danger tree assessments and mitigation efforts.

Underplanting in the southern Interior is a reforestation strategy that has been widely employed to successfully reforest areas impacted by wildfires. When underplanting is not a viable option on NSR stands, the other option is to site prepare by knocking down the burnt snags with heavy equipment, and pile and burn the debris (aka knockdown). Since 2005, the government has funded both underplanting and knockdown treatments on wildfire killed stands.

The Benefits of Underplanting

Underplanting helps reduce greenhouse gas (GHG) emissions by enhancing carbon sequestration through prompt reforestation and by avoiding emissions associated with the burning of piles created with the knockdown technique. Underplanting also reduces additional GHG emission, and air quality concerns, by leaving the dead trees to slowly decay over time instead of piling and burning the fire-killed overstory.

Underplanting is also significantly more cost-effective than knockdown, pile, burn, and plant. It also eliminates the need for knockdown, which costs \$1,000 to \$1,500 per hectare. Underplanting also improves habitat for a wide variety of wildlife and provides structural diversity in the regenerating forests unlike the knockdown and burn technique. Moreover, research studies have shown that standing dead trees can have a hydrologic benefit for as long as five years after tree mortality occurs by reducing snow melt rates and lower the risk of surface runoff during rainstorms.¹ The hydrological benefits of leaving dead trees standing combined with the benefits to wildlife and newly planted seedlings make a compelling case for underplanting rather than knockdown and burning.

Safety in Wildfire Impacted Stands


Safety issues during planting and surveying related to the overstory are important to consider in underplanting and guidance has been created to manage safety concerns. WorkSafe BC and the Wildlife Tree Committee of BC offer a Wildlife Danger Tree Assessor's course and have published a brochure on *Dangerous*



Leith McKenzie, RPF, has 30 years experience working primarily in the areas of silviculture and stewardship in the Ministry of Forests. She is currently the director for the Forest Investment and Reporting Branch in the Office of the Chief Forester. Leith has served as operations manager at the Forest Enhancement Society of BC, and was also the research and silviculture team lead at the Thompson Okanagan Region in Kamloops.



Tim O'Rourke, RPF, has worked with the Forest Carbon Initiative as a forest carbon specialist to help implement forest carbon projects designed to mitigate climate change; specializing in forest road rehabilitation projects. Tim is currently an old growth stewardship forester with the Ministry of Forests, Office of the Chief Forester, working to implement the recommendations made in the strategic review "A New Future for Old Forests."



Mike Madill, RPF, has held several silviculture specialist positions over his 35 year career with the Ministry of Forests. Mike retired as a forest carbon technical advisor for the Office of the Chief Forester in Jan 2022. Mike now works as a senior forester for Cariboo Carbon Solutions and One Tree Planted.



LEFT: *Underplanted Fdi one year post planting.*
Photo credit: Mike Madill, RPF.



RIGHT: *Underplanted Sx.*
Photo credit: Mike Madill, RPF.

Tree Management in Preparation for Silviculture Activities. Prime contractors, such as planting contractors must prepare and follow work site safety plans which detail how they will safely work under fire-killed snags, and provide these plans upon requests to safety representatives.

As part of the safety plan, prime contractors must complete a danger tree assessment by a certified danger tree assessor prior to reforestation activities. Trees at risk of imminently falling are either felled or a "no work zone" is established around the tree. Safety plans describe how wind is monitored and what actions will be taken if wind exceeds specified speeds. The cost of the danger tree assessment is estimated to add \$0.01 per tree to the overall contract cost.

Best Management Practices²

Where to Plant – surveys must be conducted to identify areas appropriate for underplanting:

- Select fire-killed stands that won't regenerate naturally due to a lack of viable seed.
- Select fire-killed stands where the tree branches have been burned off allowing adequate light to penetrate through to the forest floor.
- Select fire-killed stands where competing vegetation isn't expected to be an issue.
- Select fire-killed stands where the risk of seedling mortality due to the black army cutworm is low such as moist sites not prone to drought or areas that burned after September 15 and can be planted the following spring.
- Select fire-killed stands where most of the burned trees remain standing firm to allow safe and easy planter access.
- Plant seedlings at the base of standing dead trees, next to coarse woody debris or other obstacles to provide shade and protection from frost.

When to Plant – timing of underplanting has great influence on seedling survival:

- Plant south facing slopes and drought prone areas immediately after snow melt when the soil is moist to promote early root establishment.
- Plant north facing slopes and frost prone areas later in the spring after the drought prone areas have been planted.
- Late summer or fall planting is only appropriate in areas that

have adequate soil moisture in the fall.

- In areas where there is likely an abundance of viable seed that will regenerate naturally it is recommended to wait two years post fire to survey for germinates before considering a planting program.
- In areas where the black army cutworm could pose a threat to newly underplanted seedlings, it is recommended that pheromone traps be set up and monitored to determine their presence and if planting should occur. If the traps indicate black army cutworm is present, planting should be delayed until other herbaceous vegetation has emerged as this is their preferred food source rather than coniferous seedlings. Black army cutworm is associated with burnt stands, not underplanting.
- In areas or site series where grass competition is known to be an issue, underplanting should be done as soon as possible post fire so that seedlings can get established ahead of the competing vegetation.

What to Plant – species selection for underplanting depends on site conditions:

- Plant larger nursery stock where brush competition is expected to be problematic.
- Plant resilient tree species ecologically suited for the site using the Climate Based Seed Transfer System.
- Plant a variety of tree species to promote ecological diversity, reduce the risk of wildfire and to mitigate pest and disease outbreaks.
- Plant at densities that are appropriate for the values being managed such as wildlife, timber, or carbon sequestration or all of the above.

In summary underplanting of fire-killed stands can be cost effective, improve survival³ and growth, and provided multiple environmental benefits. ☘

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Reflections on My Working

Allepo and lario pine surrounding the Monasterio de Leyre, central Navarra. After thinning, the forest has been fenced for grazing.

All photos on this spread by Ken Day, MF, RPF.

For three weeks in October 2022, I had the amazing opportunity to travel in Spain to learn more about thinning in dry forests. I am so grateful to all my hosts for their patience, insight, and kindness — people were the best part of this wonderful trip. My article is equal parts travel log and reflections on what I learned about thinning in dry forests in Spain. I encourage forest professionals to travel occasionally and learn about forestry in other places. The experiences will enrich your understanding, provide learnings you can pursue in your own forestry practices, and maybe inform your thinking about how we practise in BC.

To frame my learning goals for my visit, I developed six basic questions I sought to answer, which I'll dive into later in the article:

1. Why do you thin?
2. How do you determine post-harvest density?
3. How do you schedule thinning?
4. What causes post-thinning mortality and how does it impact treatment plans?
5. How do you treat forests to reduce the impact of forest fires?
6. How do your plans change according to the various climates you have in Navarra?

From History to Ham: Thinning in the Dry Forests of Spain

I spent my first week in Madrid, much of it in museums. The juxtaposition of the *Museo de América* (exploring the history of Spanish colonial development in the Americas) with the Royal Palace and the art at the *Museo Nacional del Prado*

Ken Day, RPF, recently retired as manager of the University of British Columbia Alex Fraser Research Forest and the Williams Lake Community Forest. He is now operating a small forestry consulting business in Williams Lake.

was sobering. The wealth accumulated by colonial powers from home and abroad is stunning, and that helped to put some context around my own colonial inheritance.

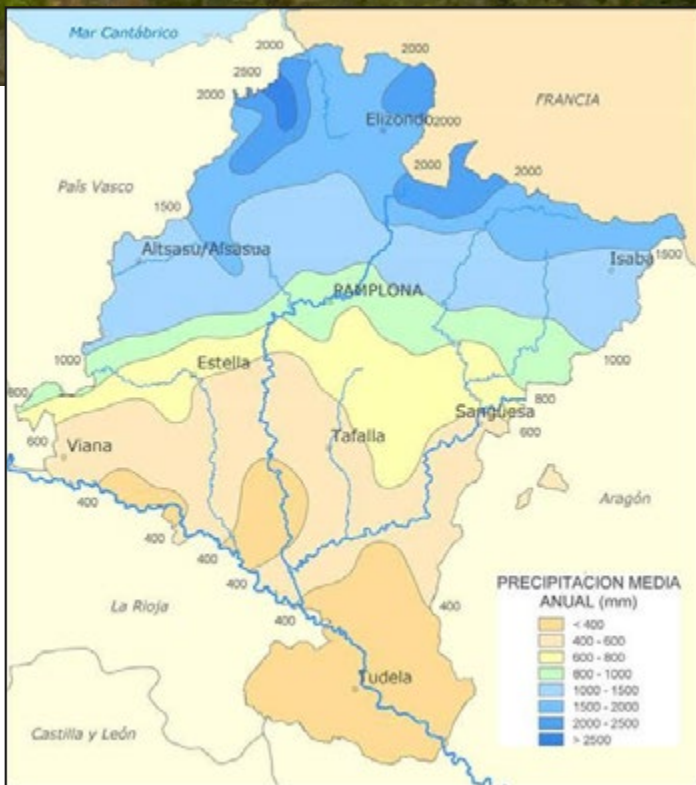
While in Madrid, I had the good fortune to spend time with two professors from *La Universidad Politécnica de Madrid*, Dr. Alfonso San Miguel and Dr. Sonia Roig. Both are professors in the forestry program, in silvo-pasture and silviculture respectively. At dinner, I learned that the best *jamon iberico* (Iberian ham) is a forest product, finished in oak *dehesas* (open woodlands) for four months where the pigs feed free-range on grass and acorns. The management of *dehesas* is purposeful and supports domestic range values, rural community stability, forest products, wildlife, and biodiversity.

The next day my hosts took me to see a thinning trial in 60-year-old maritime pine (*Pinus pinaster*) northeast of Madrid. I learned that by the time of the Spanish Civil War (1939) the forests of Spain were substantially denuded by people making fuel wood and charcoal, which was their primary source of energy. Resulting erosion and poor water quality led the new regime to initiate an afforestation program (1940-1960) — primarily with three species of pine — to stabilize the upper slopes and ridge-tops, provide local employment, and provide wood products and firewood. The thinning trial by Dr. Roig and her students is looking at different thinning intensity (20 or 30 per cent removal) and approaches (from below, from above, or selective thinning). They are also researching group selection cutting for natural regeneration.

In my second week, I was hosted by the *Servicio de Guarderío y Calidad de la Gestión Ambiental*, (guardian service and quality of environmental management) and the *Sección de Gestión Forestal* (forest management section), both in the *Departamento de Desarrollo Rural y Medio Ambiente*, (department of rural development and environmental management) in Pamplona, the capital city of the Province of Navarra. My principal host was Mikel Rapáraz, who



Vacation in Spain



Navarra, Spain, showing the rapidly changing precipitation along a NS gradient, at the intersection of climatic influences from the Atlantic Ocean, Mediterranean basin and Pyrenees Mountains.

arranged for me to meet each day with different planning foresters and implementing guardians (rangers). We toured thinning plans and operations as well as fire salvage, along with other interesting projects where opportunity allowed. I was also able to join a field tour for a climate adaptation workshop held by *La Universidad de Navarra*, where I was pleased to meet Dr. Juan Blanco, a former post-doc in Hamish Kimmins' lab at UBC.

Navarra is a province in the northeast of Spain, and Spanish provinces have jurisdiction over environmental policies. Given the location of the province in the northeast corner of the Iberian



Post-fire salvage logging in Aleppo and lario pine near Artazu, south Navarra. The log sale was purchased by pulp company Smurfit Kappa, and logged by their contractor from Portugal.

Peninsula, they have widely variable climate under the influence of the Atlantic Ocean, the Mediterranean basin, and the Pyrenees Mountains (see map). In 200 kilometres from the south of the province to the north, annual precipitation ranges from about 250 millimetres to about 2,500 millimetres. In Pamplona, mean annual temperature is 12.9 degrees and mean annual precipitation is 674 millimetres. Forests in Navarra vary accordingly, from grasslands and *matorral* (scrub forest of oaks and shrubs) to beautiful high forest of pines, oaks, beech, and spruce. All of those are under management.

I learned that in Navarra, much of the forest land is in public ownership, governed by the province on behalf of and with input from town councils. The province prepares nested forest management plans — an over-arching plan for the province setting out goals, objectives, and targets; and then more refined individual plans for each town's forest. Each individual forest plan is accompanied by a 10 to 15-year harvest plan, which takes into consideration the needs and wants of the town councils. Planners set the harvest plan based on information gathered by the guardians working in the plan area. Planners also prepare contracts for sale to implement each harvest or thinning block. Net revenues accrue to the town council.

Many harvest sales are purchased by integrated forest companies, but independent contractors also buy sales as market loggers. Guardians supervise the logging to ensure the treatment proceeds according to plan. Sales are made as standing timber based on the pre-harvest inventory.

As in BC, forest fires are a driving concern in Spain and last year was a particularly bad year. Though fires are small by BC standards, the population and infrastructure density are high. Fires are generally caused by accidental ignition, and while communities are dense and built primarily from stone or concrete, the croplands

Continued on following page



ABOVE: *Climate adaptation field tour stop in oak scrub forest at Leyre, central Navarra. 300 hectares of pine forest and oak scrub were burnt in 2022, with several runs up the mountainside to the alpine.*

RIGHT: *Fourth thinning in laricio pine north of Pamplona yields a substantial volume of utility poles.*

All photos on this spread by Ken Day, RPF.

and pastures adjacent to communities burn at high intensity. Understory vegetation in thinned stands and matorral (scrub) forest is flammable. Prescribed fire is a frequent practice and growing in central and southern Navarra. However, the practice is largely under the control of the *bomberos* (fire fighters) and not well connected to the silviculture practiced by the planners and guardians. Still, thinning practices do reduce fire intensity and damage, and strategic fire-breaks are clearcut with the aim to reduce fire spread.

My final week was spent in Donosti, in Basque country on the Atlantic coast. My host there was my friend and former colleague Jon Gaztelumendi, who worked as a guardian in Irutzun, Navarra. While most of my time was spent as a tourist, we did some forestry at the same time. We went to the *Albaola Itsas Kultur Faktoria* (Basque language), which is a museum showcasing the re-building of a Basque whaler found off the coast of Labrador where it was lost in a storm in 1565. The whole story was fascinating, but particularly impactful was the interpretation of the traditional craft of silviculture that provided the raw materials for the Basque ships for hundreds of years. Oak ribs for the vessels were derived by pollarding and pruning to grow the needed shapes. Large straight beech trees formed the keel in a single log. Pitch gathered from pines made the joints water-tight. Barrels made from oak held the stores for the crew and the whale oil on the return journey.

Summarizing What I Learned About Thinning in Dry Forests

So what did I learn on this great trip? As promised, I'm returning to the basic questions I hoped to explore.



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Dr. Sonia Roig describes her thinning trial in P. pinaster north of Madrid. Understory shrubs included rosemary.

Dr. Juan Blanco describes a 20-year-old thinning trial in Scots pine. Íñigo, Ismael, and Raquel discuss the outcomes of a prescribed fire lit the previous day by the fire fighters.



1. Why do you thin?

To address high stand density (PCT); provide wood for the market; improve forage for livestock and wildlife; reduce the impact of wildfires; improve the growing stock; increase species diversity; maintain forest health; or obtain natural regeneration through shelterwoods.

2. How do you determine post-harvest density?

Density depends upon the species, location, stand age and thinning schedule. Shallow soils or high wind exposure, thin less. Younger stands, thin harder. Thin harder less frequently for more efficient logging. Thin more often at lower intensity for better stem quality and more complete capture of mortality.

3. How do you schedule thinning?

Forest management plans indicate a 10-15-year thinning schedule; coppice forests (stump sprouts from oaks) need several thinnings early in stand development; density and thinning schedule are tightly linked; missing or deferring a scheduled thinning means the live crown ratio will shrink and trees will become more slender and less stable.

4. What causes post-thinning mortality and how does it impact treatment plans?

Fire effects caused mortality in thinned laricio pine and Aleppo pine; a scolytid bark beetle in the genus *Ipps* is prevalent in older stands, can produce up to four generations per year, and responds quickly to fire-caused mortality. Widespread mortality would cause a revision to the harvest schedule.

5. How do you treat forests to reduce the impact of forest fires?

Open stands develop a flammable understory; post thinning conditions reduce fire severity but do not stop fires; thinning and prescribed fire together avoided ignition in one example; surface fuels limited to limbs and small tops yielded fuel loads with sufficient fuel strata gap to avoid crown fire but fire severity and intensity were sufficient to cause mortality.

6. How do your plans change according to the various climates you have in Navarra?

Primarily by changing the target species to be favored in regeneration and retained in thinning; certainly higher precipitation provides more species diversity and higher site quality. Aspect, altitude and storm wind direction are important variables in assessing site conditions.

Forestry in BC is in a transition (still?) and part of that transition is from harvesting wild stands to planning and managing stands and forests. In my opinion, thinning has a prominent role in the new paradigm. I feel strongly we can learn from other jurisdictions to avoid some of the pain in the transition.

In my experience, I have found forestry people to be engaging, inquisitive, friendly, and receptive. Whether as a host or as a traveller, I think people are the best part of the experience. During my career at UBC Forestry, I often had the good fortune to be a host and occasionally a traveller. Seeing how others practise and drawing out lessons from sights and conversations has enriched my practice and my life more generally. Being a willing host has given me connections and opportunities to travel, providing unique opportunities to learn more about forestry and culture from many wonderful people. I recommend the experience to everyone. ☘

WILDLAND FIRE PRACTICE:

The Knowledge, The Group, The Practice

These days wildland fire is relevant to most areas of professional forestry practice in BC. Like the situation many years ago when we recognized it was essential to learn the language of BEC, wildfire behaviour knowledge is becoming a necessary foundation in a professional's understanding of the forest. That is not to say that each professional needs to be an expert in wildland fire and fuel. However, where do we go to gather the information or experience required in our particular practice? We learn from experts in our fields and we also learn from each other by sharing the experiences in our practice. This article is about that collective energy and learning that exists within the broader group of practitioners.

What is a community of practice and why is it important?

Educational theorists recently coined the phrase "community of practice" to describe the relationship and the benefits that accrue when practitioners come together to learn and grow.¹ Communities of practice are groups of people who share a concern or a passion for something they do and learn how to do it better as they interact regularly.²

The practice of the forestry profession comprises, in part, a body of knowledge, applied by practitioners to solve real world problems in the interests of the broader society and the environment. The body of knowledge commonly associated with a particular practice area is supported and used by the group of professionals

who practice in that area. Communities of practice are not new and have been a part of professional culture for many years.

Mike Larock, RPF, is FPBC's director of practice. Mike develops and communicates professional standards, provides FPBC responses on professional practice matters, and oversees the organization's forest stewardship commitments.

Kelly Osbourne, RPF, is the fire and fuel management officer with BC Wildfire Service. Previous to her work with BCWS, she worked for Forests for Tomorrow and BC Timber Sales in the Ministry of Forests. Kelly is also a leader in the BCWS/FPBC - Wildfire Joint Working Group.

The community, by its nature, assists each professional in their professional development, all the while creating the identity for the collective of which every individual is a part.

"It is through the process of sharing information and experiences with the group that members learn from each other, and have an opportunity to develop personally and professionally."³

Communities of practice are particularly important to forest professionals because our work is complex, our forests are large and diverse, the objectives for the forests change, our forests are changing, and all of this requires forest professionals to be adaptive in their practice.

The CoP can be described as having three parts, visualized by concentric rings (see Figure 1).

At the core are the professionals who regularly work, influence, or study in the practice area. The body of knowledge is typically held by the core group. The second ring are those persons who occupy the field of practice in their work, are seasonally connected, or engage in a specialty that is aligned with the practice. And the third ring are interested persons who understand some aspects of the practice and want a regular connection to the professionals in the field of wildland fire practice.

Communities of practice in the forestry profession will:

- Raise the bar and enhance consistency in the delivery of professional service.
- Improve job performance of participants.
- Improve professional contacts.
- Increased sharing of applied knowledge within employer groups, also across the practitioner community.

BC Wildfire Service (BCWS) and Forest Professionals British Columbia (FPBC) have taken the lead to initiate the CoP in order to enable ideas and shared experiences and knowledge among the people who work in this field. A leadership group was established between the two regulators, and is currently called the Joint Working Group. Under the *Professional Governance Act*, the professional regulatory body (FPBC) is directed to collaborate with other regulators in support of registrants' professional practice. Specifically, the PGA calls the regulatory body to "promote and enhance the ability of its registrants to respond and adapt to changes in practice environments, advances in technology and other emerging issues."

The PGA also requires the regulator to develop competence standards, which are the minimum skills and abilities to under-



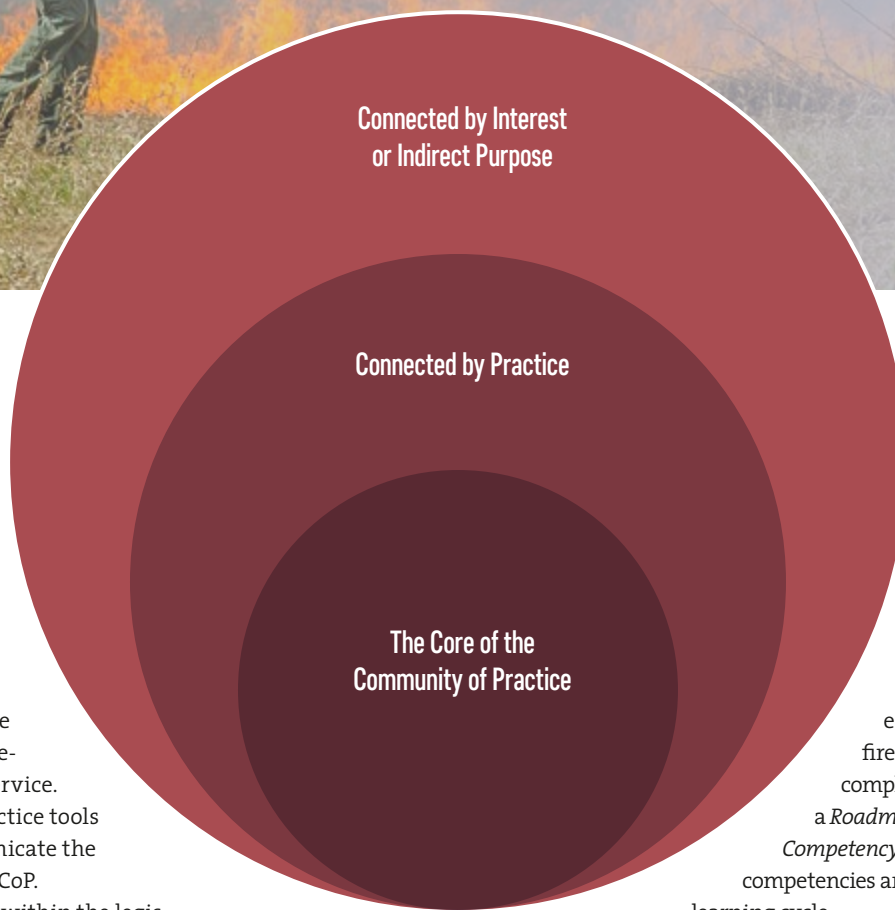
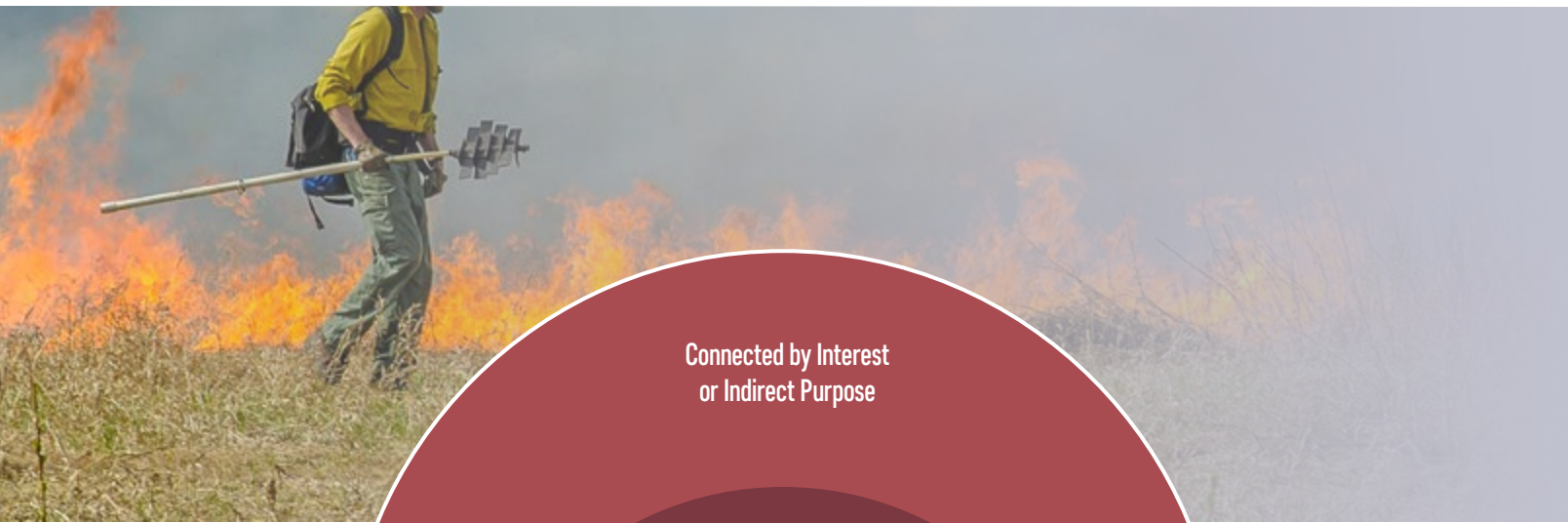


FIGURE 1

The three parts of a community of practice.

take a particular practice task, and practice standards, which establish the manner and method of delivery of a professional service. Guidelines and other practice tools are developed to communicate the standards to the broader CoP.

To meet the challenge within the legislation, the Joint Working Group has started several projects. The first project was the CoP webinar.

The first CoP webinar was held in January 2022. Each CoP webinar has three components, a professional development opportunity, current updates from the regulators or research practitioners, and an open forum for comment and questions. Subjects such as FireSmart, fire behaviour, cultural burning, and community resiliency plans are examples of subjects covered by the meeting.

In addition, the Joint Working Group has four projects that began this year: practice areas, Wildland Fire and Fuel Guidelines, practice competencies, and a professional peer review process.

The Wildland Fire Practice Areas project is established to review and potentially rename the practice areas used by FPBC registrants to declare their areas of competence. The CoP will be included in the development of the names of those practice areas.

The *Interim Guidance on Fire and Fuel Management* was published in 2013 to serve the public interest by instituting a standard of expectation for forest professionals. FPBC and BCWS funded work to review and replace the 2013 guidance with a current edition, *Wildland Fire and Fuel Management Guidelines*. Finalizing this document is a priority for the regulators and the second project of the working group.

The third project is to document the steps necessary in building wildland fire professional practice. The completed registrant resource is a *Roadmap to Wildland Fire Practice Competency*, identifying the specific competencies and where they occur in the learning cycle.

The professional peer review process is the fourth project. The consequences of poor preparation for wildland fire, or the need to adequately assess risk, or to effectively prioritize the treatments and funding means that a reliable and rigorous peer review procedure is necessary in our practice. The peer review will enable practitioners to work through a review process that evaluates and assesses the adequacy of professional works. Two sub-projects are being explored, one in prescribed fire and the other in forest fuel management.

Our Wildland Fire CoP is integral to the discussion and communication on each of these projects.

The application of knowledge is at the heart of the professional's role in society. The practitioners in a community of practice use and support the knowledge of the profession and advance the practice. The beneficiaries of the Wildland Fire Community of Practice are the practitioners, the forested environment, and our communities. This form of collective learning is an important professional undertaking for each of us. ☺

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Gathering at the OIB Band office in Oliver after a visit to the wildfire area with Minister Katrine Conroy, MLA Roly Russell, Okanagan and Selkirk Natural Resource District and BC Timber Sales representatives, and OIB and Vaagen forestry staff. Photo credit: Edena Brown, Ministerial Advisor to Minister Katrine Conroy.



MLA and Parliamentary Secretary for Rural Development Roly Russell (far left), Minister Katrine Conroy (third from left), and the Osoyoos Indian Band Forestry crew along McKinney Road east of Oliver. Photo credit: Elly Macmaster.

Continued from Page 11

utilizing existing roads and trails, recruiting coarse wood debris, and placing debris perpendicular to the grade on sloped ground. Where vehicle access is restricted, small (two-to-three metre wide) wildlife piles have been left in severely burned blocks to provide refuge areas and habitat for critters.

Restoration of these burned areas is being approached in a more holistic way than a typical wildfire salvage operation that will include replanting native shrubs, in conjunction with fire-resistant species such as trembling aspen, western larch, Douglas-fir, and ponderosa pine to assist in revegetating multi-story ecosystems that provide wildlife and cultural values sooner than without human intervention. Working with key personnel from the OIB, enhanced restoration will occur near sensitive drainages and key wildlife corridors, with less focus on growing timber and more on reintroducing multiple values on the land while integrating wildfire resiliency.

Shrub and tree seeds have been collected from OIB Reserve lands and processed with planting scheduled for spring 2024. A native shrub program will start with species including juniper, Sitka alder, prickly rose, smooth sumac, New Jersey tea, and ocean spray, and expand each year to include areas not impacted by fire.

All phases of planning, operations, and restoration have provided full-time, part-time, and contract employment to OIB members,

the Nk'Mip Forestry crew, and local contractors. Activities such as planning, field reviews, layout, supervision, night security, and harvesting have all relied on expertise from OIB workers. This will continue during silviculture activities with pile burning, grass seeding, seed collecting, site visits, native shrub planting, site preparation, and supervision.

The next steps for the OIB include cultural heritage reviews of the fireguards prior to rehabilitation and grass-seeding, forest health and tree mortality monitoring due to a greater incidence of beetles and pathogens expected in trees that have weakened defense mechanisms, and monitoring the success and failure of planted vegetation to inform subsequent activities. These interventions will inevitably be required for other recovery strategies in response to future impacts from fire, water, wind, insects, and people.

In the wake of devastating natural disturbances such as the Nk'Mip Creek Wildfire and observing communities grappling with how to respond and recover, I return to that conversation with the Elder and how their words apply to everyday activities — forestry and otherwise — as an internal reminder that we are just one component of the environment yet can have such a significant impact. ☘



FIGURE 4.
Low elevation submesic forest before and after resilience strategy implementation.

Photo credits:
Erik Leslie, RPF.



Continued from Page 13

gic landscape-level fuel breaks (resist), thinning to lower stand densities (resilience) (Figure 4), and removal of fire- and drought-intolerant species to promote Douglas-fir, Ponderosa pine, and deciduous (realignment).

**Phase 3:
Management Plan and Allowable Annual Cut (AAC) Scenarios**

The risk assessment addressed the question of *where to adapt*. The operations strategy addressed the question of *how to adapt*. The third phase of the project addresses, in part, the question of *how fast to adapt*.

As forest managers, our ability to address climate change is limited by the scope of our operations. There are many issues and risks we cannot easily address (e.g. drought risks outside of the timber harvesting landbase). Since many adaptation strategies require active management, the potential rate of harvest is a key adaptation consideration. Prioritizing the protection, management, or conversion of stands with high probability of drought and/or wildfire can potentially help reduce risks to timber values while also addressing risks to homes, water, and biodiversity values.

Ultimately, AAC determinations are social decisions based on values and priorities, and should include assessments of the relative risks associated with a range of scenarios. Thus, in the final part of the project, timber supply modeling is being used to assess the potential impacts of a suite of adaptation-based harvest scenarios. The scenarios will be used to inform discussions during our next AAC determination.



Transition of drought-prone site to more open conditions, Harrop Creek. Photo credit: Erik Leslie, RPF.

Conclusion

This project is a case study. Our goal is to pilot tangible adaptation strategies and actions, and to stimulate discussion. Our community forest now has an action plan with clear management priorities and site specific adaptation targets. Over the next two to three years, I would like to collaborate with other BC community forests and land managers to scale up and refine the methods piloted in our project. Let's get to work on the ground and make it real.

More information about this project can be found on the Harrop-Procter Community Forest community updates page of the website⁵ and the BCCFA 2021 Conference - Session 7: Climate change adaptation on YouTube⁶.

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FOREST PROFESSIONALS BRITISH COLUMBIA 75TH FORESTRY CONFERENCE AND AGM:

A Photo Round-Up

NOT PICTURED:

Congratulations to Cynthia Lu, MA, RPF, P.Ag, winner of the BC Forest Professional Magazine Best Article of the Year award for her article "Overcoming Our Silence on Old Growth and Beyond" in the Winter 2022 edition. Cynthia was unable to attend in-person.



2022 Distinguished Forest Professional, Alan Waters, RPF(Ret).

Artwork: Eagle in Flight, a Red Cedar panel created by Coast Salish carver Doug Horne.



2022 Professional Forester of the Year, Daniel Macmaster, MSFM, RPF.



2022 Jim Rodney Memorial Volunteer of the Year, Philip Smith, RPF, ATE.



FPBC 75th President Garnet Mierau, RPF, shakes hands with Jeremy Araki, P.Eng, winner of the FPBC/EGBC Forest Engineering Award of Excellence.



FPBC 75th President Garnet Mierau, RPF, congratulates Michael Jull, MSc, RPF, one of two forest professionals named as a 2022 Distinguished Forest Professional.



Past-president Garnet Mierau, RPF, welcomes new president Jamie Jeffreys, RPF.



Congratulations to Julie Shuyan Jiang, RPF, a TD Insurance Meloche Monnex Valedictorian Award winner.



Indigenous Leadership and Co-managing BC's Forests presenters (LEFT TO RIGHT): Lennard Joe, RPF, CEO First Nations Forestry Council, and Chief John French, Takla Lake First Nation.



Forest Management: It's More Than Timber presenters (LEFT TO RIGHT): Jeff Mycock, RPF, chief forester of West Fraser's BC Operations, and BC Chief Forester Shane Berg, RPF.



What Have We Learned in an Era of Mega Fires? presenters (LEFT TO RIGHT): Robert Ballinger, RPF; Paul Hessburg, PhD; Lorraine Maclauchlan, PhD, RPF, RPBio.



Some of the crew representing the CIF, which includes activities such as National Forest Week and Forests without Borders (LEFT TO RIGHT): Margaret Symon, RPF; Candace Parsons, RPF(Ret), Life Member; Kessie Konwicky, RPF; and Nicola Littleton, RFT.



FPBC Government-appointed councillors (LEFT TO RIGHT): Kalpna Solanki, CPHI (C), BSc, MBA; Wendy Royle, CPA, CA; Alison Dempsey, LLB/JD, LLM, PhD; and David Morel.

First Year of Mandatory Continuing Professional Development a Success

Thanks to the great efforts of practising registrants, the first year of mandatory continuing professional development (CPD) was completed with 90 per cent compliance. Approximately 3,100 registrants reported a total of 140,573 hours of learning activities. Registrants that met or exceeded the minimum number of qualifying hours (30), reported 46 mean CPD hours. Learning continues to be an important part of professional practice and registrants have demonstrated a commitment to learning.

A list of registrants who did not report 30 or more qualifying hours of CDP by November 30, 2022 was provided to the audit and practice review committee. The committee directed the registrar to send a non-compliance notice to registrants requiring them to complete any outstanding hours by November 30, 2023, unless an exemption or extension for special or unique circumstances was considered. You can learn more about CDP non-compliance in Bylaw 10 and the committee policy.

Learning Preferences

On-the-job learning such as meetings and conversations with other professionals was the most reported learning modality. Next, were formal classroom and field-based workshops followed by conference-based learning, webinars, and e-courses. Podcast-based learning is also being used more frequently. The learning activities reported reveals that forest professionals engage in a wide range of formal- and informal-based learning reflecting the importance of accessible, point of need, and relevant learning opportunities to support ongoing competence and conduct.

Many registrants also develop practice competence by participating in formal and informal communities of practice with others sharing similar and related practice areas, locations, technology, or employers. These communities are integral for information and best practice sharing in various forms (e.g. working groups, committees, and associations), scale (e.g. local to national), and practice (e.g. climate change adaptation, forest measurements, inventory, cruising, silviculture, and safety).

Aligning CPD learning activities with a practice area or a key skill and ability is an important part of CPD reporting. This information helps Forest Professionals British Columbia (FPBC) identify CPD interests and practice areas to help provide timely, relevant learning opportunities.

For reported CPD learning activities, the following practice areas were selected the most frequently:

Troy Lee is the manager of member competence and engagement with Forest Professionals British Columbia. He has a BSc in Forestry (UBC) and a Master of Arts in History (UNBC). Troy has over 20 years' experience in learning and continuing education. When not encouraging others to learn, he explores BC's backroads, backcountry, and trails on his mountain bike.

1. Other;
2. Indigenous Reconciliation; and
3. Silviculture.

A review of the “Other” category selections revealed several interesting things to help improve CPD resources and reporting. In some records, a practice area was noted in the learning activity topic or content, but “Other” was selected. Remember to scroll the list of available practice areas and competencies to select and consider the most applicable category. In records where the learning focused on forest economics and business, carbon, or some conference sessions there may well be no clear selection. In those cases, “Other” is an appropriate selection. If you cannot align learning activity or outcomes with a practice area or key interpersonal and professional competencies, it should not be reported as CPD qualifying hours.

Consider two important questions for reporting learning activities: “*Is it aligned with one of the categories in the first drop-down menu in the reporting tool?*” and “*What was learned?*” Put another way, can you identify a key knowledge, skill, ability, or behavior learned?

Similar to practice area alignment, the “Future Learning Opportunities” field provides important data for the development of FPBC webinars and e-courses. These outstanding learning outcomes can also be included in a professional development plan. One thoughtful registrant wrote in the “Future Learning Opportunities” field: “*Observe, anticipate and adapt! Continue to learn more about climate change and climate challenges in order to better anticipate silviculture challenges and identify better paths for future silviculture management.*”

The future learning identified here illustrates the principles of adaptive management and also the cognitive move from knowledge to application. The top five topics for the 2021-2022 reporting period were:

1. Wildland fire;
2. Indigenous Reconciliation;
3. Legislation, policy and regulation;
4. Forest harvesting operations; and
5. Silviculture.

Registrant feedback regarding upskilling ranged from higher level planning to site-level operations reflecting again the wide range of practice amongst forest professionals.

Conclusion

Great work on your CPD reporting for 2021-2022 everyone. The CPD records forest professionals’ submitted, plus other feedback, ensures FPBC provides relevant, on-demand and accessible learning activities to help support continued competent practice. ☘



The Future of Sustainable Forestry

On December 7, 2022, BC's Premier David Eby announced his new cabinet and provided Mandate Letters to each of the Ministers. In his letter to the Minister of Forests, the Premier stated BC's forest sector has "never been under greater stress." Likewise, the letter to the Minister of Water, Land and Resource Stewardship calls the province's forests "exhausted."¹

While it's a dire tone to strike, the Premier suggests the way out is by embracing sustainability.

The end of 2022 brought global attention to the need for sustainability and biodiversity conservation. The year ended with a landmark agreement at the COP15 – UN Biodiversity Conference in Montreal. Countries from around the world, including Canada, signed onto an accord to address biodiversity loss, restore ecosystems, and protect the rights of Indigenous Peoples. But what does it mean for our forests and how do we accomplish this while simultaneously ensuring the health of our forest sector?

The interconnected nature of biodiversity and sustainable forests

Biodiversity encompasses all life within forested areas — plants, animals, microbial communities — and their associated genetic diversity. And the health of every element of a forest is connected, which is why land-use change, such as forest loss and gain, is a crucial driver of biodiversity change.

This was backed up by *Natural Resources Canada's Annual Report 2022: The State of Canada's Forests*.² The report emphasizes the close relationship between resiliency and the preservation of biodiversity, underscoring that species diversity and genetic diversity are both incredibly important for ecosystems: species diversity helps maintain a balanced ecosystem; a robust level of genetic diversity strengthens the ability of those species to adapt to changing environments by passing on the most suitable and adaptable genetic traits.

Where do we find solutions? New tools are becoming available

Before you can conserve something, you first need to know it's there, which is why cataloguing and quantifying biodiversity is critical. This helps us understand the impacts over time from natural changes and human activity. This is a massive challenge in Canada. We're the world's second-largest country and we have about 80,000 species, excluding bacteria and viruses, which are even more challenging to catalogue due to the sheer volume — a single gram of soil can harbour up to 10,000,000,000 bacterial cells.

New technologies powered by genomic sciences are providing potential solutions here.

The world has made incredible strides in genome sequencing. Over the past two decades, the cost of sequencing genomes has dropped precipitously, from over \$3 billion (the cost to sequence the

first human genome) to now under \$1,000. It's also more accessible. Current technology now makes it possible to sequence a genome using portable hand-held devices at any location.

At Genome BC, we've been working on these issues since the early 2000s, investing in projects to identify microbial communities present in the forest soil; to understand how these microbial communities are impacted by logging and other forestry activities; to sequence the genomes of conifers; and to identify species at risk, such as the northern goshawk.

Other projects focus on adaptation and mitigation strategies that can inform sustainable forestry, such as selecting genetic varieties that are more resilient and can withstand anticipated climate change impacts, identifying species that are likely to prosper if migrated to specific climate zones, and ways to enhance genetic diversity at the landscape level during reforestation.

And there is more to come. In the future, tools such as environmental DNA, or eDNA, will revolutionize how we manage biodiversity in our ecosystems.

Although eDNA tools have existed for many years, technological advancement and lower costs now make them economical and practical to use widely. Current Genome BC funded projects are creating new eDNA tools, developing ways to identify and track biodiversity and drafting standards for these activities. Data from these projects advance our understanding of biodiversity and the genetic (genotype) and functional (phenotype) trait diversity of our forests and associated ecosystems. These outcomes will revolutionize the future of biodiversity in Canada and will also be critical for the forest sector and the Indigenous Peoples — who have the longest and strongest connections with our forests.

Nonetheless, genomics still has huge potential for growth. More frameworks need to be established, including regulatory processes; the implementation of citizen science and Indigenous monitoring programs; and ways to store, manage, and analyze the massive amount of data that results from our ability to sequence easily.

As the movement toward biodiversity and forestry sustainability intensifies, genomics is one of the avenues our forestry sector needs to explore to adapt to changing demands and ensure the long-term health of the forests we manage.

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2. Natural Resources Canada's Annual Report 2022: The State of Canada's Forests. Online at <https://www.nrcan.gc.ca/our-natural-resources/forests/state-canadas-forests-report/16496>

It is very important to many registrants to receive word of the passing of a colleague. Registrants have the opportunity to publish their memories by sending photos and obituaries to editor@fpbc.ca. Forest Professionals British Columbia sends condolences to the family and friends of the following registrants and colleagues:

Gordon Joyce, RPF #1284

April 21, 1953 – April 30, 2022



In spring 2022, we lost a highly valued colleague, Gordon Joyce. Gordon graduated from UBC Faculty of Forestry in 1979, specializing in forest hydrology and forest soils. He joined the GVRD (now Metro Vancouver) as an Operations and Research Forester, becoming the first manager of the Seymour Demonstration Forest in 1987, showcasing new and sustainable forestry practices and opening an area that

had been closed to the public since the 1920s.

In 1990, Gordon became the Chief Forester of the Greater Victoria Water District, which later became the Capital Regional District (CRD). The challenges in Victoria began almost immediately on his arrival. Public controversy over logging and a Supreme Court case and a Royal Commission on management of the watersheds all required Gordon to lead a paradigm shift from a sustained yield harvest program and logging crew into a watershed protection organization.

In 1998, Gordon played a crucial role in negotiating a land exchange between Kapoor Lumber Company, the Government of BC, and the CRD to obtain lands critical to Victoria's water supply.

Another challenge was the mega project of the raising of Sooke Dam in 2003 which required careful clearing, including a rail line, for inundation. The work was achieved while the water was maintained in continuous use with no impact on drinking water quality.

After 22 years overseeing the watersheds of the Greater Victoria water supply, Gordon retired from the CRD in 2012 to carry on his passion for forest management by starting his own consulting business. In this new venture, Gordon lent his time and energy to assist T'Sou-ke Nation, the ABCFP, and forest companies. He assisted the T'Sou-ke Nation with their woodlot and silviculture programs among other things, and had a great working relationship with T'Sou-ke staff, Chief, and Council.

Gordon volunteered his expertise on the ABCFP/EGBC Joint Practice Panel, the Technical Review for Watershed Assessments, as well as sponsoring and mentoring other aspiring forest professionals. He worked for the ABCFP Audit and Practice Review Program as well as contributed to the first audit of a firm providing professional forestry service.

Beyond his career, Gordon treasured his wife Julie; his son and daughter-in-law, Ryan and Melissa; his grandsons, Austin and Isaac; and his family members and friends. The common thread for those who knew Gordon, was his passion for forestry, high expectations for the profession and his colleagues, his people skills, and his humour and humility. Gordon, you left us too soon, but we continue to be inspired by your passion for forestry and zest for life.

Submitted by Annette Constabel, RPF, with contributions from Julie Joyce; Mike Larock, RPF; Tom Tamboline, RPF(Ret); Ron van Oord; Michelle Thut; and Bruce Smith, RPF(Ret).

William Young, RPF(Ret) #160, Life Member

August 23, 1926 – December 2, 2022



After a short illness, William (Bill) Young passed away at Sidney All Care Residence in Sidney, BC on December 2, 2022, at the age of 96 years.

Predeceased by his youngest son, Robert, Bill is survived by his loving wife, Emily; his eldest son, William (Agnes); his granddaughters Genevieve and Alexandra (Chris); and his great-grandson, Alexander.

Born into a Scottish immigrant family, Bill spent his early years in North Bend, BC where his father worked for the railroad. At the age of 12, Bill and his family moved to North Burnaby where he graduated from high school. A forestry degree (1949) from UBC started Bill on his forestry career; and after working in Victoria and Prince George, he retired in 1985 as BC Chief Forester.

Bill was proud of his Scottish heritage, learning to play the bagpipes at the age of 60 and later joining a Victoria pipe band.

He will be deeply missed by all his family. A celebration of life was held on December 12, 2022 in Victoria.

Submitted by Bill's son, William A. Young, RPF(Ret).

Brett Nelson, ASFIT #5496

December 18, 1987 – December 9, 2022



It is with great sorrow we announce the passing of Brett Nelson on December 9, 2022. After seven years of living with brain cancer, Brett told his body to rest, and his body listened. He passed at home surrounded by love and gratefulness for his life. He is deeply mourned by his loving wife Alise; parents Rick and Kelley Nelson; brothers Sean and Paul Nelson; Steve Thate and

godson Logan; in-laws Gordon and Janice Johnson; sister-in-law Lauren Wolstencroft (Steve); niece Lucy; and numerous aunts, uncles, cousins, and grandparents. Brett is predeceased by his grandfather John Marsh and grandmother Elaine Holgate.

Brett had a great love for sports, which saw him playing for Team Canada in the Babe Ruth Little League World Series at age 12 and earning recognition as one of the 10 best players in the tournament. He also played soccer in several leagues, squash, ran, biked, and tried his hand at anything athletic at least once.

He graduated from Langley Christian School before continuing to the University of the Fraser Valley and then transferring to UBC where he completed a degree in Forestry, Forest Sciences — graduating with Honours. In 2013, Brett began a career with Canfor in Prince George where he excelled with his love of creating community and his passion for the outdoors. Brett worked in field operations, permitting, and planning roles during his tenure at Canfor. While nearing the completion of his ASFIT, Brett always practised with diligence and care for the profession and was considerate of his obligations as registrant of Forest Professionals British Columbia. Brett's passing has left a hole among his colleagues and all those he interacted with in the forestry community.

He loved to travel and travelled extensively through Europe with Alise, as well as several trips to Mexico and Central America. In the last few years, Brett embarked on several BC road trips to visit breweries around the province, indulging his other passion: beer. Brett was a great lover of all things craft beer; the hoppier the better.

Brett approached life with a zest for adventure, a quick wit, an easy smile, and a genuine interest in getting to know anyone and everyone who quickly became new friends. He was thoughtful, compassionate, courageous, and full of joy.

His life was beautiful. His loss is immeasurable.

Submitted by Alise Nelson, Brett's wife; and Andrew Flegel, RPF.

Robert Collins Sutton, RPF(Ret) #260, Life Member

March 28, 1929 – December 21, 2022



Robert Collins Sutton — a boy from Moose Jaw, Saskatchewan who claimed there were "few" trees there — relocated to Vancouver to do his university studies at UBC, in a province at the time economically driven by trees.

Robert — Bob to those who knew him — graduated in 1953 with a degree in Forestry. Bob's first job was with the BC Forest Service (BCFS) in Survey and Inventory.

Later, interests would take him to the Protection Division.

Bob spent his early years in Prince George and his later ones in Victoria. He absolutely loved his work. Bob retired after 32 years at age 56 so he and wife Beverley would be strong enough to continue their outdoor adventures together, whether it be ocean kayaking or the myriad backpacking hikes that included the Westcoast Trail several times, Haida Gwaii, Mount Edziza and the Continental Divide in many annual segments.

With his photography passion, he assembled amazing albums documenting family milestones, his outdoor adventures, and his career with the BCFS. Bob was a precise man. A private man. He had the right partner in his life with his wife Beverley, who he was married 65 years. They had five children, Cheryl, Alan, Leslie, Julie, and Janice. His love of nature certainly has extended to his family.

Submitted by Cheryl Sutton.

It is very important to many registrants to receive word of the passing of a colleague. Registrants have the opportunity to publish their memories by sending photos and obituaries to editor@fbbc.ca. Forest Professionals British Columbia sends condolences to the family and friends of the following registrant:

William Edward Dumont RPF(Ret) #832, Life Member

July 15, 1948 – January 25, 2023



With much sadness we announce Bill's passing following a brief illness. Bill grew up in south Vancouver, sixth of 12 children. He leaves behind six siblings, several siblings-in-law, dozens of nibblings and grand kids, his special friend Brenda, and his dogs Iris and Sadie.

In 1971, Bill graduated with a UBC Faculty of Forestry forest management degree. After graduation, Bill joined CUSO as a volunteer forester in Malaysia. He often fondly recalled that period of his career and wrote about it in a memoir he was working on.

Bill returned to Canada in 1974 and found a job in Port Alice as Resident Forester for Rayonier Canada — later Western Forest Products (WFP). His work focussed on timber cruising, reforestation, environmental protection, and silviculture; however, he found time to be elected village councillor. He transferred to Haida Gwaii in 1979 during the battle to create Gwaii Haanas (formerly the South Moresby national park reserve).

Bill moved to Port McNeill in 1982 as WFP's Forestry Manager, where WFP was managing over one million hectares of coastal rainforests. He worked on planning prior to and after timber harvesting. Bill also handled public demands for more parks and conservation in BC, and worked with First Nations who wanted economic development.

Bill was elected President of the Association of BC Professional Foresters in 1984-85 and in 1992 Bill received the Distinguished Professional Forester award from his peers in recognition of his

advocacy to support sustainable forest management. Over his career, Bill estimated he had overseen the planting of more than 100 million trees in tropical and temperate rain forests.

Bill was instrumental in creating advanced educational opportunities for practising forest professionals and engineers through the establishment and management of the Forest Management Institute of BC (FMIBC) (formerly the Silviculture Institute of BC) in the 1980s. He was Chair of the Board of Directors and liaised with UBC to achieve official diploma status for graduates from the Advanced Silviculture Diploma Program and the Advanced Forest Engineering Diploma Program. When FMIBC closed in 2003, Bill ensured its legacy through an endowment to UBC Forestry graduate students with a professional background.

Bill had an amazing capacity to juggle his active professional career along with his community projects. He enjoyed leading tours for the BC Festival of Forestry, organizing National Forest Week events, and hosting field trips for seniors and youth.

Bill loved to fish for salmon and became involved in the federal DFO salmon enhancement program. He helped develop seven community-run salmon hatcheries on Haida Gwaii and northern Vancouver Island, which produced more than 10 million salmon fry during that time. For his work, Bill was recognized by Canada's Governor General with the Canada Recreational Fisheries Award.

In 1992, Bill attended the World Environment Conference in Rio de Janeiro as part of a small delegation representing the BC forest sector and rural communities. His booth was adjacent to the Dalai Lama's peace organization, and Bill was honored to meet the Dalai Lama. A Rio outcome was the establishment of independent forest certification, primarily to reform forestry practices in tropical rainforests, but embraced by most northern hemisphere countries.

In 1993, Bill was promoted to Chief Forester at WFP. While his main responsibilities were preparing for sustainable timber harvests, reforestation, and overall forest management, much of his time was taken up resolving land use conflicts, primarily in new parks and protected areas.

In 2002, Bill was approached by the Sarawak Government in Malaysia to be the Chief Operating Officer of a new government corporation running the parks, wildlife, and forestry department. After 28 years with WFP, he and Brenda move to Kuching, Sarawak. While Bill enjoyed being back in Malaysia, the corruption in the forest and government sectors added to the challenges and after a few years Bill and Brenda returned to BC (Cobble Hill).

Various international and local forestry projects took up much of his time until retirement and several First Nations invited Bill to join their economic development corporations as a Director. Bill often said the lack of a dedicated land base for forestry was BC's biggest challenge. He felt politicians could and did regularly remove — on a whim due to 'green' and other pressures — some of Canada's finest forest lands from BC's working forests at huge cost to workers, communities, and the economy.

A noted chef, Bill will long be fondly remembered by close friends, forest professionals, First Nations, gardeners, and his family.

Submitted by Ron Bronstein, RPF(Ret); Candace Parsons, RPF(Ret), Life Member; and Alan Fry, RPF(Ret).



A Moment
in **Forestry**

"Scenic as it is, this is probably the brushiest regen block in the entire Quesnel Forest District, from my experience after surveying about 100,000 hectares. Logged in January 2017, mounded in June 2017, and planted with Sx and Pli in July 2017. Two years after it was mounded, it had 100 per cent cover of 2.5 metre tall fireweed and cow parsnip growing on top of continuous 1.5 metre tall twinberry, thimbleberry, devil's club, and willow." *Photo by Graham Gerry, RPF*

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