Northern Silviculture Committee Winter Conference 2012: From Theory to Practice

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In February 2012, 145 silviculture professionals from across northern British Columbia gathered at the University of Northern British Columbia in Prince George for the annual Northern Silviculture Committee conference. Presenters from government, academia, non-government organizations, and the consulting community provided information related to the conference theme, "From Theory to Practice."

All conference presentations are available at: http://www.unbc.ca/continuingstudies/events/nscwinter.html

Of particular relevance to this topic was the presentation by **Teresa Newsome** (Ministry of Forests, Lands, and Natural Resource Operations [FLNRO]), who described a case study on making research-based changes to the free growing guidelines related to allowable broadleaved tree density in the Cariboo-Chilcotin Forest District. Using a seven-step approach, researchers and operational foresters worked together to 1) determine the research question, 2) review existing research, 3) conduct the research, 4) interpret and publish the results, 5) verify that a broad application of research results is appropriate, 6) consider the *Forest and Range Practices Act* (FRPA) requirements, other resources, and operational procedures, and 7) accept the proposed changes, as informed by the research results, and request administrative implementation. Newsome commented that quite often, researcher involvement stops after step 4.

In Newsome's example, the research question developed was, "How much aspen is too much in young lodgepole pine stands in two subzones in the Chilcotin?" Their team found that there were minimal differences in lodgepole pine survival, vigour, height, or diameter growth at age 18 between stands with up to 6,000 stems per hectare of aspen. They concluded that aspen was not a significant competitor with pine at either study site. Further work was done to test the applicability of the results to other similar sites and subzones in the Cariboo-Chilcotin. The impacts of proposed changes to free growing stocking standards were then assessed against the five tests of FRPA. As per section 26 of the *Forest Planning and Practices Regulation*, these tests include 1) Initial high level test, 2) Ecological suitability test, 3) Forest health test, 4) Economically valuable supply of commercial timber, and 5) Consistency with timber supply review. The proposed changes were also assessed against other resource values (biodiversity/wildlife, soils, hydrology, fire, and invasive plants) as well as operational considerations (e.g., potential changes to survey procedures). The final step in the process was to determine how to implement the changes administratively.

It was decided as a group that the logical approach in this situation would be to incorporate the changes via a District Policy. Hurdles to overcome included securing fund-

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ing to test how research results could be applied operationally, increased administrative time and complexity when deviating from standard practice, and the lack of a well-defined process for translating research into operational application, including which legislative or policy vehicle to use to enable the change. Newsome also noted that one of the key factors in the success of this project was the committee approach, which included group discussions, and government, industry, researchers, policy makers, and management all working together to solve this problem.

Shirley Mah and **Kevin Astridge** (FLNRO) described the tree species selection tool that is currently under development. This tool will help natural resource managers identify ecologically suitable species within an ecological unit (e.g., biogeoclimatic subzone/variant and site series) by providing links to the best available science-based information on four key influencing factors: tree species silvics, ecological risk factors, management objectives/values, and climate change adaptation strategies, for a given geographical location. The tool will also help provide the linkage between landscape-level species composition and distribution, and stand-level species selection decision-making.

To view the tree species selection tool visit: http://www.for.gov.bc.ca/hfp/silviculture/TSS/TSStool.htm . Content is currently available for the Northern Interior Region. Content development for the Cariboo and Coast Regions is in progress.

Continuing with the tree species selection theme, a trio of speakers **Barry Jaquish**, **Donna Brochez**, and **Phil LePage** (FLNRO) described their experiences and work with western larch. Jaquish discussed the silvics of the species, including its shade tolerance, growth patterns, and tree form. He concluded that western larch has the potential for reforestation beyond its current natural range and informed participants about the seed zone maps that have been developed using bioclimate and genetic models that can be used to guide future planting. "Most importantly," said Jaquish, "consider western larch's autecology prior to planting—don't fight it, you'll probably lose."

Brochez also shared her experiences with planting western larch operationally in the Lakes District. Brochez and her colleagues have planted a small percentage of larch annually for the past three years. Their planting efforts have focused on sites where stem rusts on pine have been problematic. To date, western larch seedling survival and growth has been good. However, in 2008, they lost 80% of the larch seedlings due to heat stress in the storage reefers and also experienced some post-planting losses to frost. To address these issues, they experimented with planting frozen, individually wrapped seedlings and found that this technique worked quite well. Brochez noted that although this has raised planting costs by about 10%, it has resulted in higher seedling survival and increased seedling transport efficiencies.

A 28-year old western larch plantation near Vanderhoof, BC. Photo credit: Al Wiensczyk

And finally, LePage reported on a project in the Skeena Region to locate and monitor the performance of plantations in which non-local species (west-

ern larch, interior, and coastal Douglas-fir) had been test planted over the past 50 years. They located 64 plantations that ranged in age from 18 to 53 years, and measurement results indicated that the growth of the non-local species was at least equal to, and in many cases better than, that of the local species. LePage also presented the risks associated with planting non-local species including porcupine damage, snow press, needle blight, and forked stems but noted that the status-quo was not risk free either, with the risk of mountain pine beetle, Dothistroma needle blight, root collar weevil, and pine stem rusts. Summing up, LePage said, "a reforestation strategy carries some risk, but adding approved non-local species to our planting bag is a viable option for adapting to climate change."

Information on another species of interest was presented by **Alan Vyse** (Thompson Rivers University). Western white pine was once a prized commercial tree species in the southern areas of the province before it was decimated by white pine blister rust (*Cronartium ribicola*), an introduced pathogen, which arrived in British Columbia in 1910 on Christmas trees imported from Europe. Vyse described efforts by BC and US scientists to address this disease, including the development of resistant seedlings, the seed for which is now available. Planting of these seedlings within their natural range is being encouraged and work is underway to determine if climate change may result in range expansion. More information is available in the Tree Improvement Branch Bulletin "Western White Pine – What's not to like?"

See http://www.for.gov.bc.ca/hti/publications/misc/Western_White_Pine_bulletin.pdf .

"Drought, either directly or indirectly, is likely to be one of the leading causes of forest dieback due to climate change," said **Craig DeLong** (Ecora Resource Group Ltd.). DeLong presented a tool that he and his project team have developed, which allows users to incorporate site level climate change impacts into operational land management decisions. When users enter site-level Biogeoclimatic Unit and Relative Soil Moisture Regime (RSMR) information, the tool calculates the current and predicted future (2020, 2050, 2080) Absolute Soil Moisture Regime (ASMR) based on anticipated changes to climate. The tool also allows users to see the risk of drought-related mortality for different tree species based on its drought tolerance. DeLong added that he has now begun to work on a frost risk tool.

Remote sensing technology was the theme of a pair of presentations. In the first, **Doug Bolton** (University of British Columbia) explained how Light Detection And Ranging (LiDAR) works and the different types of LiDAR available (profiling, small-footprint, large-footprint, and ground-based). Small-footprint LiDAR is the type most commonly used in forestry applications. LiDAR can be used to directly measure tree heights and calculate accurate estimates of stem volume and basal area. However, having accurate plot data is critical to ensuring accurate estimates of forest attributes, noted Bolton. He also gave participants an update on the latest improvements to this technology, both in the airborne sensing equipment and in data processing. The cost of this technology is currently around $3 per hectare. In the second presentation, **Cezary Slugocki** (Erafor Forestry) described how he was using high-resolution digital photography to assist with the identification of areas to treat under the Forests for Tomorrow program. Low level, high resolution (1:500) aerial photographs were taken of the areas of interest. The images were fully digital, mosaic, geo-coded, and geo-referenced. The images were analyzed using specialized computer software to enhance the photos and show more vivid features, which assisted in the identification of areas for on-the-ground field reconnaissance and the delineation of areas requiring rehabilitation treatments. Costs of the photos and analysis ranged from $3.00 to $4.70 per hectare. Both LiDAR and high resolution aerial photographs have a broad range of forestry application, including forest vegetation and wetland

inventories, forest planning (including road location planning), forest cover updates, vegetation management, entomology, pathology, and fire detection and post-fire evaluations.

The use of herbicides to control competing vegetation in plantations is an often hotly debated topic. Indirectly related to this debate is the move by many municipalities and provinces to ban the cosmetic use of pesticides. "The Integrated Vegetation Management Association of British Columbia (http://www.ivma.com) is an organization of professionals dedicated to the responsible practice of all aspects of vegetation management," said their President **Gwen Shrimpton.** She described the role of the association and the importance of vegetation management to their member base, which includes representatives from railways, highways, oil and gas, electrical utilities, nurseries, forestry, noxious weed control, and agriculture. She also described the vegetation management treatments that have been tested and also discussed the advantages of herbicide use. In addition, she talked about the work that the association is doing on behalf of members with regards to the proposed ban of the cosmetic use of pesticides in British Columbia, including making a presentation to the BC government's Special Committee on Cosmetic Pesticide Use in November 2011. Finally, Shrimpton made conference delegates aware of the Integrated Vegetation Management Conference, scheduled to take place on November 20–21, 2012 in Prince George.

Update: Special Committee on Cosmetic Pesticides in BC Report – released May 17, 2012: http://www.leg.bc.ca/cmt/39thparl/session-4/cp/reports/PDF/Rpt-CP-39-4-Report-2012-MAY-17.pdf

A pair of speakers also addressed the issue of 2nd growth stand monitoring. **Tamara Brierley** (FLNRO) introduced a new framework, which is being implemented by the Forest Analysis and Inventory Branch to monitor the performance of young (15–50 year old) stands. Data will be collected to determine stand gross and net volume, site index, total age, species composition and conversion, pest and disease incidence, and operational adjustment factors and will be used as an independent check on the accuracy of the growth and yield projections used in timber supply reviews. The monitoring program will mesh with existing plots, including Change Monitoring Inventory (CMI), National Forest Inventory (NFI), Vegetation Resource Inventory (VRI), Audit/young stand monitoring, and permanent sample plots (PSPs), as well as the Stand Development Monitoring (SDM) plots. Work in the 2013 field season will focus on plot installation in the Kootenay Lake, Morice, and Quesnel Timber Supply Areas. Analysis of re-measured CMI plots in mature mountain pine beetle impacted stands will also be conducted.

For more details refer to http://www.for.gov.bc.ca/hts/vri/monitoring/dowloads/monitoring-framework_13Jan2012_ver2-2.pdf

In the second presentation, **Alex Woods** (FLNRO) reported on the results of the SDM plot work conducted in the Mackenzie Timber Supply area in 2011. The basal area growth of lodgepole pine closely followed the projections from the Table Interpolation Program for Stand Yields (TIPSY) if forest health factors were not taken into account and was 32% lower than predicted in TIPSY when they were. Top heights were comparable between TIPSY and SDM. Suppression was the main forest health factor affecting pine (20% of stems assessed) followed by western gall rust (16% unacceptable infections). For spruce, top height and basal area growth were found to be greater than predicted by TIPSY. Woods noted that there was also a slight drop in the number of well-spaced trees in the 12 years since the last surveys but that the numbers were still well above minimums.

Lee Martens (Alberta Ministry of Sustainable Resource Development) shared information on the new reforestation standards for Alberta, which came into effect May 1, 2010. They have developed a system that uses cumulative mean annual increment (MAI) as a measure to determine reforestation success. Regenerating stands are classified by the licensee in Year 1, following harvest, into one of ten species composition stratum.

Performance assessments must be completed on the stand within a 12–14 year post-harvest window. When conducting the performance assessment, all qualifying openings within a Forest Management Agreement Area (FMA) or Forest Management Unit (FMU) are pooled together and a computer program is used to select those openings to sample in the field. Another computer program is used to compute the conifer and deciduous MAI for the sampled openings based on the collected plot data and this is compared against a performance standard to determine regeneration success. For more information on their new system, visit http://srd.alberta.ca and search for "Reforestation Standard of Alberta."

"What looks aesthetically pleasing does not necessarily equate to greater field performance." That was the conclusion voiced by **Steven Kiiskila** (New Forest Treeworks) based on the results of a trial in the Vanderhoof Forest District looking at the effects of initial lodgepole pine seedling height (within one stock type) on plantation performance. He noted that there was no significant difference in survival, height, stem volume, and height/diameter ratio between "small" seedlings (below specifications) and medium and large seedlings (above specifications) after 13 years. However, Kiiskila noted that a caveat to these results was that there was minimal herbaceous competition on the site. He recommended that on these types of sites in the central interior of BC, grading guidelines for lodgepole pine seedlings could be lowered. This would reduce costs, as less seedlings would need to be culled. This in turn would also help to conserve expensive class A and/or scarce class B seed.

Bruce Rogers (FLNRO) provided an update on changes to the Biogeoclimatic (BEC) system. Some BEC zones and maps have been adjusted based on new data, a new coding scheme has been introduced, and several new guidebooks have been published. For details visit http://www.for.gov.bc.ca/hre/becweb.

The conference also included a silviculturists' Community of Practice open discussion forum. During the forum, **Lee Charleson** (FLNRO) informed participants of the new discussion board feature on SPAR (Seed Planning and Registry Application), which can be found at http://www.for.gov.bc.ca/hti/spar/index.htm. **Kevin Astridge** led a discussion on free growing stocking standards. He emphasized that the stocking standards provided in the Establishment to Free Growing guidebooks are meant as guidance and expressed concern that some of the context surrounding their creation has been lost over time. He stressed that foresters need to take into consideration forest health concerns, wildlife values, range and recreation needs, site quality and productivity, and landscape level species diversity when developing stocking standards for different sites. And concluding the discussion forum **Andy Muma** (FLNRO) demonstrated a new web map application for mobile devices (e.g., iPad, iPhone, et cetera), which allows users to update information in office-based databases in real time from the field (e.g., planting completed on a block).

At the Northern Silviculture Committee banquet, **Dana Hicks** (FLNRO) gave an entertaining presentation on his experiences fighting wildfires in Australia and **Larry Cosman** (Aveling Ent) was presented with the distinguished silviculturists award.

The Northern Silviculture Committee summer field tour, a field follow-up to the winter conference, was held in Smithers, BC on June 19–21, 2012.

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