

SILVICULTURE RESEARCH

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I graduated from UBC with a BSc in forestry in 1982 and spent a few years working for myself as a silviculture contractor doing a wide range of operational work. I began working for the Ministry on contract in Smithers in 1986 and was fortunate enough to win the competition for assistant research silviculturist a year later. I returned to university in 1990 to get my Master of Science degree from Oregon State. Since then, I have spent most of my time working in the north studying post-harvest stand establishment and development issues. During the ministry re-organization, I spent two years assigned to the Coast Forest Region where I continued my research on north and central coast forest structure, composition, and yield concerns. My current research focus in the RNI is on the recovery of interior forest stands following both natural and anthropogenic disturbances. My research is closely linked to the Ecology program and both groups have benefited from the involvement of staff from other research disciplines.



Ecosystem Recovery Research

The basis for many of our forest management decisions is rooted in the structure, composition, and growth rates of both our old and regenerating second-growth forests. Many assumptions have been made about these extremely complex processes; however, there is not a lot of hard science behind some of them. While we do have extensive data on our old forests, there is currently very little available for our second-growth stands. As our forest practices move from harvesting old-growth to a second-growth dominated landscape, knowledge about how these forests grow and how a variety of ecosystem attributes develop through time, particularly in light of a rapidly changing climate, is critical to sustainable forest management. My ecosystem recovery research was initiated on the coast in conjunction with the Ecology program and has since been expanded to our northern interior forests. Our interdisciplinary research team has established plots throughout the Kalum (SBS), Kispiox (ICH), Skeena, Fort St. James, and Nadina (SBS) Forest Districts in the last few years and will continue to examine the second-growth stands in other districts in coming years.

Legacy Research Plots

The research program has a long history in the north and, in addition to those projects that are currently active, there are a large number of legacy projects that were established up to 45 years ago. Many of these projects have provided useful information in the past and, because of their age, can provide us with irreplaceable information today. One such example is a partial cut experiment that was established in 1962 to examine how well spruce grows under a pine overstory. This project was tracked by successive researchers for 40 years and is now helping us to determine how spruce understories will respond to a MPB-killed overstory. Another example is the numerous "off-site" species planting trials established over the last 30+ years.

With climate change impacting our forests in a big way, the ability to study second-growth stands of different species, where we have several decades of continuous monitoring, is an incredible asset. In 1998, I initiated an inventory of all old research experiments in the (old) Prince Rupert Forest Region so we could assess their condition and potential utility and ensure that they were properly protected. Since that time, the project has expanded to include the entire province and, with the assistance of a wide variety of ministry staff in many areas and disciplines, we have developed a complete digital database of our research sites. This information is now stored as a layer in the LRDW and can be accessed by all ministry staff and industry foresters (see <http://www.for.gov.bc.ca/hre/pspdata/> for a complete description).

Stocking Standards and Species Selection

I have been involved with the development of provincial stocking standards for many years and I am currently a member of the provincial species selection technical advisory committee. We are in the final stages of developing a web-based tool to help guide operational foresters during their tree species selection process. This tool will ensure that all the latest relevant research and technical information regarding the suitability of a tree species is available to both prescribing and reviewing foresters (<http://www.for.gov.bc.ca/hfp/silviculture/TSS.htm>). In addition, the TAC is working on a new landscape-level species selection process with the goal of ensuring that BC's future forests provide a diversity of well-adapted, healthy, resilient stands across the landscape that will fulfill the needs of future generation. Climate change has had a major impact on our forests and all the climate models predict that this trend will continue, possibly at an increasing pace. Because we deal with a "crop" that takes multiple decades to reach maturity, this will have major implications for the viability and possibly survival of our future forest crops. We have all seen the impact of the climate-induced Mountain Pine Beetle outbreak and it is likely that a changing climate will bring more forest survival, growth, and health-related problems. The committee is working to ensure that our managed forests are set up to deal with these changes as effectively as possible. This includes increasing species diversity and density at both the stand and landscape level and assisted migration of native species to new areas of the province.

Extension Activities

- Presentation of research results to our local ministry and industry clients, to the chief forester, and to the larger research community through peer-reviewed journal articles.
- Assisting BCTS and district staff in the identification of valuable research sites to ensure their protection (via a Government Action Regulation (GAR) Order).
- Communication with a wide variety of forest and range license holders regarding the impact of the GAR order establishment on their activities.
- Review of proposed stocking standards in submitted Forest Stewardship Plans.
- Contribution to expert technical teams.
- Advising on the operations needs during the development of the new ArcGIS forest cover map making tool "VegPlot" (released November, 2007).

Recent Publications and Extension Products

Coates, K. David, Charles D. Canham, and **Philip T. LePage**. 2009. Above- versus below-ground competitive effects and responses of a guild of temperate tree species. *Journal of Ecology*. 97: 118-130.

Banner, A. and **P. LePage**. 2008. Long-term recovery of vegetation communities after harvesting in the coastal temperate rainforests of northern British Columbia. *Canadian Journal of Forest Research*. 38(12): 3098–3111.

- Heemskerk, B., E. Hall, A. Banner, **P. LePage**, K. McKeown, and K. White. 2008. Ecosystem Recovery: How have forests of the north-western Interior Cedar Hemlock zone responded to past disturbances? for: BC's Inland Rainforest – Conservation and Community; Conference held at UNBC, May, 2008. (PowerPoint presentation and abstract).
- Rowland M. Shelley, Robert A. Cannings, **Philip T. LePage**, and Ken J. White. 2007. A glomeridesmid millipede in Canada (Diplopoda: Glomeridesmida). Entomological News. 118: 199-202.
- Banner, A. and **P. LePage**. 2007. The HyP³ Project: Pattern, process, and productivity in hypermaritime forests of coastal British Columbia. (PowerPoint presentation to Chief Forester).
- Banner, A., **P. LePage**, B. Heemskerk, K. McKeown, K. White, and E. Hall. 2007. Ecosystem Recovery -What is it and how long does it really take? (poster presentation).
- Banner, A., **P. LePage**, J. Moran, and A. de Groot (compilers and editors). 2005. The HyP³ Project: Pattern, process, and productivity in hypermaritime forests of coastal British Columbia – a synthesis of 7-year results. B.C. Min. For., Res. Br., Victoria, B.C. Spec. Rep. 10. 142 pp. <http://www.for.gov.bc.ca/hfd/pubs/Docs/Srs/Srs10.htm>