BRITISH COLUMBIA | Ministry of Forests

Forest Health Bulletin

The Extent to Which an Unforeseen Biotic Disturbance Can Challenge Timber Expectations

Forest pathogens are one of the key drivers of the diversity of forested landscapes, contributing to structural and compositional complexity at multiple scales in space and time. Growth and yield models help guide forest management decisions but the roles of abiotic and biotic disturbance agents including pathogens are often overlooked. In our study we assessed the influence of a biotic disturbance agent, Tomentosus root disease, over more than half of the planned rotation age for a randomly selected set of ten managed interior spruce stands in the Kispiox Timber Supply Area of NW BC. In our one-hectare stem-mapped plots we examine the apparent spread from infected stumps of the previous stand to new host trees and then from tree to tree as the stands approach 50 years of age. We then assess the growth and yield of individual crop trees and relate that to the presence of root disease. Our stands were selected without prior knowledge of the presence or incidence of any biotic disturbance agent. Silviculture records were reviewed for each of the stands to determine their forest management history. Our sample represents the oldest managed stands in the area as clear-cut harvesting was not common practice in the area prior to the late 1960s.

We found model projections of spruce volume exceeded measured plot volume by an average of 30.5% with much of this difference likely due to tomentosus root disease. Our results reflect the influential role of a forest pathogen that is operating on a different scale and following a different set of rules than those foundational to most growth and yield models used in forest management. The lack of integration between studies of forest disturbance and broader growth and yield models and dynamic vegetation models is a global information gap that our work helps to fill. We reinforce earlier challenges to the status quo understanding of forecast managed forest growth by presenting clear evidence of a forest dynamic driven by a biotic disturbance agent. Traditional growth and yield concepts are largely based on the assumption that most trees that die prior to rotation age are killed by inter-tree competition. These suppressed trees are not the projected dominant crop trees. Our research shows how a biotic disturbance agent is killing both small and large trees and when large trees are lost unexpectedly the impacts to timber productivity are significant.

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Alex Woods, MSc., RPF has been the Forest Pathologist in the Skeena Region for 29.5 years.

After 34 years of trying to keep people from unnecessarily killing trees, Stefan has decided to hang up his hand lens and Pulaski and retire.

Stefan was recruited as the regional forest pathologist for the long since renamed Prince Rupert Forest Region before completing his MSc in 1989. Back then Forest Health was called Pest Management (a more direct time) and resided within the Protection Branch. This was where Stefan first met Tim Ebata, the regional entomologist at the time. Protection soon took the opportunity to dump pests onto the Silviculture group during the heyday of the "Big Green Machine". During this time, Stefan became involved with the Silviculture Working Group, formulating legislation and practices guide-books for the soon to be introduced Forest Practices Code.

In 1994, Stefan left Smithers for Nanaimo and the relocating Vancouver Forest Region. For the next 27 years, Stefan was the regional forest pathologist, and after regional entomologist Don Heppner left, the sole regional forest health person for the entire Coast Area. This meant Stefan had to pay attention to entomology, a chore he never quite mastered. During this time, he was involved in establishing the first invasive plants program on the coast, working with fabulous people at Range Branch. Who knew weeds could be so interesting?

During the "COVID years", Stefan went temporarily insane and began working for Resource Practices Branch in 2021 as the Forest Health Officer. Over the last two years, Stefan has overseen some of the most talented forest health staff ever to work for the program, a few even being entomologists. It was a tumultuous couple of years defined by the four levels of management between himself and the Deputy Minister all changing within the span of a year along with the introduction of Forest Landscape Planning and the setting in legislation of forest health as one of five objectives. Concurrently, the forest health team managed to completely revamp the provincial forest health strategy, successfully manage the two most intensive spongy moth treatment projects in ministry history (Thanks Jeanne, Marnie, and Babita!), and get the Chief Forester into the field not once, but twice, to show him the great work we do.

In 2022, Stefan was honoured to receive the Thelma Finlayson Lifetime Achievement Award from the Professional Pest Management Association of BC. Over his career, Stefan had the pleasure of working on numerous projects involving Rhizina root disease, Tomentosus root disease, porcupines, lodgepole pine dwarf mistletoe, white pine blister rust, Armillaria root disease, laminated root rot, Septoria canker, yellow-cedar decline, Phytophthora spp., and Swiss needle cast with a long list of collaborators inside the ministry and with universities and the federal government. Stefan thanks his numerous colleagues and co-workers over the years and suggests that you be kind, be calm and remember to take your hand lens with you in the field.

The Forest Health team thanks Stefan for his contribution to the Ministry, and for being a thoughtful, fearless leader. We wish Stefan a happy retirement as he and his wife, Dorothy, continue globetrotting.

Stefan Zeglen, MSc, RPF has been a forest health specialist with the Ministry for 34 years.

Changes within the Forest Health Team:

Thomas Binsl, PhD, joined the team as Forest Health Data Scientist in early 2023 and is physically located at the branch in Victoria. He has a background in Bioinformatics from the Saarland University, Germany (BSc, MSc) and VU University Amsterdam, The Netherlands (PhD). Prior to starting with the ministry and public service, Thomas worked for a Dutch and later a UK company developing data analysis applications for new medical diagnostic devices and technologies.
Thomas enjoys his new role as Forest Health Data Scientist, where he focusses on supporting provincial and regional FH specialist, thereby contributing to the health of an ecosystem that he and his family fell in love with so many years ago when they first visited British Columbia.

Babita Bains, MSc., RPF, realized she wanted to be a forester after completing her undergraduate degree in biology and several seasons of tree planting. In 2005, Babita enrolled at UBC to complete her RPF requirements but was side-tracked and ended up completing her MSc in forest health. In 2010, she started her "professional" career as a consultant with B.A. Blackwell & Associates Ltd. where she had the opportunity to work on a broad range of projects but in 2015 Babita decided she needed a change of pace and joined the Ministry as the Seed and Seed Planning Officer with BCTS. In 2017 Babita was provided with the exciting opportunity to join the Forest Health team and worked as the Provincial Forest Entomologist for six years. With Stefan Zeglen's retirement, Babita decided to take on the daunting role as the Forest Health Officer and is excited to continue working with the Forest Health team, broaden her horizons and start paying attention to pathology, and take on new challenges.