

---

In China, forest fire managements to the Greater Khingan Mountains after 1987 demonstrate that fire suppression and restoration have altered the landscape and the regional fire regime. Meanwhile, other cases show reciprocal implications of forest ecology into establishing the management practices. Efforts for controlling the pine wilt disease in Japan are relevant to denote how typical researches have influenced the forest management strategies. Comparisons of natural forests with managed forests in the Gwangneung experimental site reveal how long-term ecological monitoring has led to the improved practices in managing water and nutrient resources, carbon sequestration, and biodiversity. Also, other long-term ecological researches across the East Asian countries have accompanied the advances in management practices and rehabilitation guidelines.

E-mail: yson@korea.ac.kr

### **Insights into forest ecology from management**

Dan Binkley<sup>1</sup>, Mark Adams<sup>2</sup>, Harri Mäkinen<sup>3</sup>

1. *Northern Arizona University*
2. *University of Sydney*
3. *Finnish Forest Research Institute*

Forest management activities have altered many forests around the world, shifting forest structure, species composition, and growth rates. The scale of these operations can enhance our scientific understanding of forest ecology. We explore this perspective with three case studies. 1) Monitoring of forest growth in thousands of plots across Finland revealed that forest growth more than doubled in the past 60 years. The scale of the sampling allowed strong tests of contributing factors, and warming climate accounted for about one-third of the increased growth. 2) The influence of forest structure on the severity of uncontrollable wildfires was evident from landscapes in both Australia and the United States. Managed forests were less likely to burn, and to burn at lower intensity, than unmanaged forests. 3) The connections between management and ecology can be enhanced with a blended, “pocket science” approach where management-scale activities include simple treatments that provide opportunities to learn. Routine inventory plots in Brazil were paired with simple fertilization plots to explore nutrient limitations across gradients in soil and climate, improving silvicultural operations. Scientific understanding for large populations of inference may be strongest when based on information derived from large areas.

E-mail: dan.binkley@alumni.ubc.ca

### **Insights into management from forest ecology**

---

Jean-Paul Laclau

*CIRAD*

Comprehensive studies of forest ecology improve our understanding of how forest ecosystems function and our ability to design sustainable silvicultural practices that maximize the ecosystem services provided by forest ecosystems. Three case studies are presented to show sustainable management practices derived from studies dealing with forest ecology. In tropical regions, large amounts of fertilizers are needed to sustain the productivity of eucalypt plantations. Improved understanding of rooting patterns in deep soil layers as well as the nutrient demands of trees and the geochemical processes controlling the fluxes of nutrients in gravitational soil solutions made it possible to reduce the cost of fertilization at large scale in Brazil by refining the timing of application needed. In coastal rainforests of British Columbia, ecological studies of old-growth forests elucidated the proximate and ultimate causes of growth check and poor nutrient supply in regenerating forests. As a result, silvicultural interventions can be focused on the causes rather than the symptoms of the regeneration problem. In temperate forests of North America, ecologists have demonstrated the importance of early successional forest habitat for sustaining biodiversity, while also incorporating legacy structures that provide habitat for other species.

E-mail: [laclau@cirad.fr](mailto:laclau@cirad.fr)

### **Degraded Shelter Forest Restoration Policy in China**

Yafei Wang

*Chinese Academy of Forestry*

Shelterbelt forestation is an important part of China's ecological establishment. However, due to multiple reasons, shelter forest in China shows a degradation in large areas, and some parts witnessed a serious degradation. According to the Eighth forest resource inventory, China now has 99.67 million hectares of protection forest, accounting for 48% of forest land area. Degraded shelter forests in Northwest, North and Northeast of China (also called "Sanbei" in Chinese), accounts for 15% of total area of shelter forests.

At present, various kinds of artificial shelter forests in China have gradually entered their maturation period and overmature period, thus increasingly suffering from aging and declining. Besides, due to economic and social development and technological conditions constraint at that time, these shelter forests are beset by such problems as single forestation species, simple structures, unreasonable density and poor stand growth status. Together with serious influence of climate change and natural disasters, the functions of these shelter forests are decreasing. This paper has analyzed problems