

Kranabetter, J.M., Williston, P., and MacKenzie, W.H. 2007. *Distribution and diversity of terrestrial mosses, liverworts and lichens along productivity gradients of a southern boreal forest*. Unpublished report.

### **Abstract**

Terrestrial cryptogams (mosses, liverworts and lichens) provide a useful suite of species for monitoring forests, especially when species distributions and diversity attributes are well defined from benchmark sites. To facilitate this, we surveyed contrasting plant associations of an upland boreal forest (in British Columbia, Canada) to explore the association of soil productivity with cryptogam distribution and diversity. Total terrestrial cryptogam richness of the study sites (19 plots of 0.15 ha each) was 148 taxa, with 47 mosses, 23 liverworts, and 78 lichens. Soil productivity was strongly related to the distribution of cryptogams by guild (i.e. lichen species richness declined with productivity, while moss and liverwort richness increased) and substrate (i.e. species richness on forest floor and cobbles declined with productivity as species richness increased on coarse woody debris). Generalists comprised only 15% of the cryptogam community by species, and mesotrophic sites lacked some of the species adapted to the dry-poor or moist-rich ends of the productivity spectrum. Consequently, plot diversity was lowest on mesic-Huckleberry sites, while rich-Oak fern replicates had the highest cumulative diversity. Patterns in cryptogam species distribution reflect soil productivity through corresponding gradients in understory humidity, soil moisture, light and microhabitat availability (exposed cobbles, large coarse woody debris), which emphasizes the need to consider inherent site conditions in ecosystem monitoring.