

Patterns of bryophyte diversity in response to partial harvesting in northern mixedwood boreal forests

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Theme: [Vegetation](#)

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Participants

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Background

Bryophytes constitute an important component of the plant diversity in northern forests, and are key to a wide variety of ecosystem functions. Given that many bryophytes are sensitive to habitat change and are commonly dispersal-limited, forest harvesting may have long-term implications for bryophyte persistence over large areas.

Objectives

Study objectives are to describe the mechanisms driving the response and reassembly of bryophytes after harvest across different forest types and harvest intensities. Research will examine the effects of structural retention on substrate availability, bryophyte diversity, and species patterns at multiple spatial scales.

Key Results

Results to date are preliminary however several important insights have been gained: Mineral soil samples collected from subplots in mixed-coniferous compartments (2004 field season, n=72 samples) were

germinated over a 32 week period to assess the composition of the bryophyte diaspore bank. Preliminary results suggest that the diaspore bank from these stands is dominated by a relatively large number of colonists, and short- and long-lived shuttle species, with few perennial stayers (sensu During 1979). Species composition contrasts sharply with results published for eastern Appalachian forests (Ross-Davis and Frego 2004) suggesting that a regional shift in diaspore bank composition is possible across forest biomes. Species composition is frequently dominated by mosses relegated to open, hygric conditions (e.g., *Sphagnum squarrosum*, *Polytrichum strictum*) which differs from the prevailing extant flora lacking these wetland species. The cover-abundance of bryophytes did not differ significantly between light treatments. However, significant differences were observed in species richness, diversity, and composition, and the frequency of sporophyte production under different light intensities. Physical and chemical properties of the mineral soil, in comparison, are likely to be poor discriminators of these characteristics. A preliminary analysis of the spatial pattern of forest floor bryophytes was conducted on species cover-abundance data collected from three transects each consisting of 300, 15x15 cm contiguous quadrats. Results from the multivariate Mantel correlograms suggest that forest floor diversity is positively autocorrelated in the smallest distance class (0-3 m) while commonly exhibiting negative autocorrelation in larger distance classes. Spatial pattern analysis using multiscale ordination was conducted on the same transect data for species occurring in >5% of plots for a given transect. Results reveal that, for each transect, different multispecies associations exhibit pattern at multiple spatial scales. This suggests that bryophyte communities are highly structured, and that different factors are likely responsible for the observed patterns at each transect location.