

Turnover in boreal forest understory following disturbance varies along a fertility gradient

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Abstract

Anthropogenic disturbances greatly alter community composition and diversity. However, it remains largely unknown which underlying processes - colonizations, local extinctions or abundance changes - drive compositional changes in response to disturbance, and whether these processes are constrained by environmental gradients. Here, we investigated the processes underlying temporal turnover of vascular plant communities in boreal forests in response to silvicultural practices along a soil fertility gradient. Our analyses were based on long-term data from 1985 to 2006 covering up to 1700 sites across Finland. While average richness remained static, we found that silvicultural practices induced greatest turnover in the most fertile habitats. In recently disturbed sites, colonizations and species losses altered dominance structure of the communities, while the undisturbed old forests were characterized by stable dominant species even when the majority of species shifted their identity. We conclude that disturbance history and fertility constrain temporal turnover in boreal forest communities.

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