

THE COMPARATIVE ECOLOGY AND POPULATION DYNAMICS OF BEECH (*FAGUS GRANDIFOLIA* EHRH.) IN NORTHERN HARDWOOD FORESTS

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The American beech (*Fagus grandifolia* Ehrh.) is a late-successional canopy dominant in forests from Nova Scotia to east Texas. I will focus on the comparative ecology and population dynamics of beech in glaciated regions of the northeastern U.S., drawing heavily on 15 years of research on the dynamics of beech-dominated forests at Great Mountain Forest in southern New England. Our research has identified 3 major axes of niche differentiation in the distribution and abundance of beech relative to other common tree species in the region: light (as it relates to successional status and response to canopy disturbance), soil nutrient availability (particularly nitrogen and calcium availability relative to its close competitor sugar maple), and soil moisture availability (with beech as the most sensitive to drought stress of the 9 dominant species at our sites). On moist, acidic soils with low base saturation, beech is the overwhelming competitive dominant in late-successional stands. Canopy beech trees promote soil and forest floor conditions that favor regeneration by beech seedlings at the expense of competitors such as sugar maple and hemlock. Limited dispersal ability (of both sprouts and seeds) plays an important role in limiting competitive exclusion by beech of other tree species. Beech trees uninfected by beech bark disease (BBD) are highly resistant to wind damage, and all but the most severe wind disturbances generally accelerate succession and dominance by beech because of the high rates of survival of small beech trees and the response of often abundant advance regeneration.

Evans, Celia A., Lucas, Jennifer A. and Twery, Mark J. 2005. **Beech Bark Disease: Proceedings of the Beech Bark Disease Symposium.** Gen. Tech. Rep. NE-331. Newtown Square PA, US. Department of Agriculture Forest Service, Northern Research Station. 149 p.

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