

RED SPRUCE/HARDWOOD ECOTONES IN THE CENTRAL APPALACHIANS

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Abstract: We are currently investigating patterns of species composition and distribution, ecologically important population processes, and microenvironmental gradients along ten permanent transects (each consisting of a series of contiguous 10 x 10 m quadrats) established across the typically abrupt and narrow spruce/hardwood ecotone at seven localities in the mountains of central West Virginia and western Virginia. Primary emphasis of our research is directed toward testing three basic hypotheses: (1) red spruce communities in the central Appalachians are decreasing in areal extent due to encroachment of surrounding hardwood communities, (2) stress-induced growth decline in red spruce is a factor in this decrease, and (3) the direction and rate of successional change can be predicted from models developed from quantitative data obtained from field studies of red spruce/hardwood ecotones. Preliminary data obtained during the 1992, 1993, and 1994 field seasons suggest that central Appalachian red spruce communities presently exist at least in static equilibrium with respect to surrounding hardwoods and exhibit, at some localities, advance regeneration into the hardwood communities. (Supported in part by funds provided by the USDA Forest Service).

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