

86th Annual ESA Meeting

Thursday, August 9, 2001. 8:00 AM to 12:00 PM. Hall of Ideas G.

Changes in tree species composition over seven decades (1930 - 2000) in an aggrading deciduous forest.

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ABSTRACT- Major questions in forest succession (e.g., causative factors, biodiversity) remain incompletely resolved in part due to a paucity of long-term data. Furthermore, earlier conclusions may no longer hold due to the influences of human activities. I studied succession in a 1500-hectare, aggrading forest in southeastern NY. Black Rock Forest was last cleared a century ago and has detailed records from 1929. I analyzed tree density, mortality, regeneration, species composition, and diversity over the past 70 years. I asked, in particular, is the current oak-dominated community a self-replacing, edaphic climax? Tree density decreased steadily from more than 1500 to 700 trees per hectare. While absolute mortality declined, annual percent mortality increased from 1.4% to 2.8% per year. Regeneration was highly sporadic. Most areas of the forest have lost shade intolerant species and have begun to gain late-successional species. Mortality in the dominant oaks was nearly five times the regeneration rate, and these have lost ground to red maple and black birch. Tree species richness increased by 15% largely due to an influx of southern, generally light-intolerant invaders, none of which has yet become common. Species diversity has increased mainly because relative abundances have become more even. In many places, especially on mesic sites, red oak appears to be giving way to more shade tolerant species. We predict substantial future canopy changes to a diverse, new community type, even in this protected forest.

KEY WORDS: succession, forests, diversity, change