

Urban forest patches in Bloomington, Indiana- Analyzing sustainability over time

Trees in urban settings, collectively termed the urban forest, provide residents ecosystem services. Municipal leaders direct resources toward planting young trees, often as a targeted strategy in climate change resilience. Less considered are existing patches of forested urban land. Urban forest patches are key providers of ecosystem services and are not immediately replaceable by planting smaller trees. Here, we draw from the Baltimore School of Urban Ecology, where social, built, physical, and biological factors dynamically interact spatiotemporally, creating interconnected networks of urban patches. We consider urban forested patches as socio-ecological systems, where social and biophysical spheres interact and continually influence outcomes. For this reason, we consider social and institutional factors important drivers of ecological sustainability of urban forested patches. This project addresses two research questions: 1) What social and ecological drivers are associated with urban forest patch perseverance, or sustainability over time?, and 2) Which governance strategies are associated with success in sustainability? Our study area is within the current City of Bloomington boundaries, and urban forest patches of one-acre minimum, width of 120 feet and tree canopy cover over 20%. We use multiple methods to address our research questions, including 1) GIS analysis of patch spatial characteristics, with attention to social and ecological variables 2) archives searches for historical changes impacting decisions regarding forested areas 3) interviews of residents with knowledge of past or present forested patches, and 4) city records searches of contributing factors to patch sustainability. Based on our work on Bloomington's Indiana University Campus, we expect to find temporal patterns, where societal variables, including periodic rapid development, drive decisions about the fate of forested patches. Results can inform decision-making impacting patch sustainability and may identify patches that could benefit from governance tactics leading to patch perseverance.