Dissertations

Greenspace Conservation Planning Framework for Urban Regions Based on a Forest Bird-Habitat Relationship Study and the Resilience Thinking

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Abstract
The research involves first conducting a "case study" of ecological data and applying the results, together with the resilience concept, to the development of a greenspace conservation planning framework for urban regions. The first part of the research investigates the relationship between forest bird abundance and the surrounding landscape characteristics, especially, forest area and its spatial configuration in urban regions at multiple scales. The results are similar for simple and multiple regression analyses across three scales. The percentage of forest cover in a landscape is positively correlated with bird abundance with some thresholds. Overall, the percentage of forest cover in the landscape, contrast-weighted forest edge density, and the similarity of land cover types to forest cover are identified as important for the conservation of the target bird species. The study points to the importance of species-specific habitat requirements even for species with similar life history traits

and of maintaining some forest edges and/or edge contrast. The second part of the research involves the development of a landscape planning meta-model and its conceptual application to greenspace conservation planning, integrating the results of the first part. Administrative and planning units are recognized to exist in a nested hierarchy of neighborhood, city, and urban region, just as biodiversity can be conceived in a nested hierarchical organization of genes, populations/species, communities/ecosystems, and landscapes. Resilience thinking, especially the panarchy concept, provides a scientific basis and a metaphorical framework to develop the meta-model, integrating a proposed landscape planning "best practice" model at each planning scale. Ecological concepts such as response and functional diversity, redundancy, and connectivity across scales are identified as key concepts for conserving and increasing biodiversity and the resilience of an urban region. These concepts are then used in the meta-model to develop the greenspace conservation planning framework. Ecological processes such as pollination and dispersal, as well as social memory and bottom-up social movements---small changes collectively making a large impact at the broader scales as well as these incremental changes gaining momentum as they cascade across scales---are identified as cross-scale processes and dynamics that connect various planning scales in the meta-model.