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Beyond Borders Linking Landscapes

Final Program and Abstracts

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Effects of the sustainable forestry initiative on landscape function as measured by patterns of vertebrate habitats.

The Sustainable Forestry Initiative (SFI) adopted in 1995 by the American Forest and Paper Association is currently applied over 90% of industrial forests in the US. This program has potential effects on forest landscape structure and function, including biodiversity. Here we analyze the effects of SFI application on the abundance and spatial pattern of vertebrate habitats in a 6,000-ha forested watershed in East Texas. Simulations of landscape structure changes in the study area were conducted based on forest inventory data and SFI rules such as regeneration harvest areas limits of 49 ha for pine and 12 ha for hardwoods, streamside management zones 30 m or more wide, and a three-year green-up interval. The 266 species (83 herps, 132 birds, 51 mammals) of vertebrates potentially occurring in the study area were grouped into 12 clusters based upon their habitat requirements. One species per cluster was selected as the indicator species for the cluster. Habitat Suitability Index models were used to develop habitat suitability maps for the indicator species based on the landscape simulations. Habitat abundance and spatial characteristics for individual vertebrate species were evaluated at different points of time to assess the effects of the SFI on vertebrate habitats as compared to reference scenarios.

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The resilience of historic property mosaics: Lessons from urban landscapes.

The area surrounding Baltimore, Maryland (USA) was settled under a system of warrants and patents. This land-granting system produced a complicated and irregular original property mosaic. The original property grants in the Gwynns Falls watershed, site of the Baltimore Ecosystem Study (BES), have been mapped and compared with current geographic data sets. This analysis has allowed insight into the pattern and structure of urban landscapes. Beginning at the county scale, temporal and spatial trends in land claims created more heterogeneous property line patterns in areas further from the city. At the city scale, iron-refining operations in the tidal areas precluded the expansion of Baltimore city into the Gwynns Falls, significantly delaying urbanization. The subsequent division of the iron company lands influenced important land use decisions, including the route of the Baltimore and Ohio Railroad and the locations of the first suburban developments. At a neighborhood scale, the size and placement of current large parks relates to the size of the original properties. In addition, the original property lines mirror existing physio-chemical gradients, amplifying associated gradient effects on vegetation and hydrology.

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Land use effects on riparian plant communities of headwater streams.

Riparian corridors occupy a small percentage of the land surface in a watershed, yet are critically important for water quality protection and have the highest biodiversity levels of any terrestrial system. Human alterations of the landscape, including agricultural practices and urban sprawl, can severely impact riparian habitat, thereby altering plant community composition and allowing invasion of upland species and non-natives. To increase our understanding of how mixed land uses impact riparian plant communities, this study examines plant species diversity and abundance along twelve headwater streams within subwatersheds dominated by either forest/wetland, agricultural or suburban land uses. These headwater streams are part of two adjacent piedmont drainages located in New Jersey. This study focuses on the following questions: 1) How does riparian corridor vegetation vary with different land uses? 2) How does the distribution and composition of invasive species vary with different land uses? 3) How do the physical factors of the riparian zone change with land use? Plant communities were sampled from June through August, 2002. Trees, shrubs and herbaceous vegetation were measured within 100m^2 plots placed perpendicular to the stream. The physical variables of the riparian zone and the stream channel were measured to