

# LINKAGES AMONG BIOTIC STRUCTURE, FUNCTION AND ECOSYSTEM SERVICES IN URBAN STREAMS

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**Abstract** The field of stream bioassessment, using biota as indicators of water quality, arose from decades of studying the impacts of land use change on stream ecosystems and determining differential sensitivity among aquatic organisms. These measures of biotic structure are extremely useful in determining stream impairment. However, we know very little about how changes in biotic structure might be associated with ecosystem functions and services that humans need or desire from intact ecosystems. Examples of such functions and services include organic matter processing rates and retention, fish and macroinvertebrate production, and conversion and uptake of nutrients. Identifying important relationships between structure and function is a first step in studying streams impaired by urbanization as we seek to address ‘which functions’ we require from these systems. Watershed urbanization includes a complex suite of stressors that have been shown to singly affect both structure and function. In many cases, we lack knowledge of mechanisms that drive changes in structure and function and insights into the cases where there are tight linkages and feedbacks between the two. We present a general conceptual model of how stressors associated with urbanization specifically and most likely affect biotic structure, associated ecosystem functions and services, and their linkages in Piedmont streams.