Landscape Ecol (2013) 28:1203–1212
DOI 10.1007/s10980-012-9799-z

RESEARCH ARTICLE

Urban landscape sustainability and resilience: the promise and challenges of integrating ecology with urban planning and design

Jack Ahern

Received: 7 April 2012 / Accepted: 10 September 2012 / Published online: 21 September 2012

Abstract The twenty-first century global population will be increasingly urban-focusing the sustainability challenge on cities and raising new challenges to address urban resilience capacity. Landscape ecologists are poised to contribute to this challenge in a transdisciplinary mode in which science and research are integrated with planning policies and design applications. Five strategies to build resilience capacity and transdisciplinary collaboration are proposed: biodiversity; urban ecological networks and connectivity; multifunctionality; redundancy and modularization, adaptive design. Key research questions for landscape ecologists, planners and designers are posed to advance the development of knowledge in an adaptive mode.

Keywords Urban sustainability · Urban resilience · Strategic planning · Urban biodiversity

Introduction

The new millennium has produced a convergence of interdisciplinary interest in the sustainability and resilience of cities. Landscape ecologists are prominent among these disciplines because of the inherent interdisciplinarity their field of knowledge; their attention to spatial configuration, dynamics and associated ecological processes across scales; and their commitment to the application of scientific knowledge to landscape planning and management policies and actions. Interest in urban sustainability has grown in landscape ecology in response to recent trends and proclamations by UN Habitat, and others, that more than 50 % of the world's population now lives in cities, and that this percentage is predicted to increase to 70 % by 2050 (UN Habitat 2006). The challenges to plan and manage this new urban world clearly will benefit from the perspectives, methods and knowledge of landscape ecologists (Beatley 2000).

The new millennium has also produced a greater understanding of the concept of resilience and its implications for urban sustainability. When cities are understood and accepted as dynamic, self-organizing systems, the concept of sustainability changes. Rather than aspiring to develop an idealized spatial form with associated ecosystem services—sustainability is challenged to build the resilience capacity of cities. This applies even when the magnitude, frequency or spatial extent of these disturbances cannot be predicted. Landscape ecologists bring empirical methods and knowledge to the challenge of resilience that expands the knowledge and thinking of urban planners and designers, specifically related to: dynamics and stochasticity, heterogeneity, pattern:process relationships

J. Ahern (✉)
University of Massachusetts Amherst, Amherst, MA, USA
e-mail: jfa@ipo.umass.edu