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Review article

Emerging strategies for voluntary urban ecological stewardship on private property

Joshua F. Cerra

Cornell University Department of Landscape Architecture, 444 Kennedy Hall, Ithaca, NY 14853, USA

HIGHLIGHTS

- Private property can contribute important habitat and ecosystem services in cities.
- I describe four strategies for voluntary urban private stewardship from diverse sources.
- Private property stewardship is most effective when addressed at multiple scales.
- Combining actors and approaches enhances potential to improve urban habitat quality.
- Private property stewardship deserves greater investigation as a tool for cities.

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ABSTRACT

As global urban populations grow, green spaces in cities are under increasing pressure to provide urban habitat and perform important ecosystem services. While public natural areas are typically called upon to provide key habitat in cities, green spaces on private property make up large parts of the urban land base and provide important roles for habitat and ecosystem services that support city function. However voluntary strategies for encouraging ecological stewardship on private property in cities are not well studied. This paper accesses available literature, case studies, municipal and organizational reports, and first-person interviews to describe four emerging strategies for catalyzing voluntary private property stewardship in cities: (a) indirect incentives; (b) market-based certifications; (c) community-based initiatives; and (d) payments for ecosystem services. Each offers the potential to combine the individual actions of multiple urban landowners in order to optimize the landscape-scale benefits of these actions in a strategic way. Components, methods and drivers are identified for each strategy and examples are provided to illustrate their application. The challenge of scale in optimizing ecological benefits in cities, and the potential for institutional partnering on multi-parcel, private property stewardship efforts to generate both site-scale and landscape-scale ecological outcomes is discussed. Voluntary, urban ecological stewardship strategies offer a different set of solutions than regulatory models, and open a new land base that would otherwise be inaccessible for improving ecological function as cities change and grow.

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E-mail addresses: jfc299@cornell.edu, cerra003@umn.edu

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1. Introduction

As urban populations increase, expansion and infill to accommodate growth fundamentally constrain the area for natural systems to reside within the urban fabric, and alter the capacity for natural systems to function. At the same time, green spaces in cities are under increasing pressure to perform important ecosystem services for urban citizens. Amidst these constraints, urban areas continue to provide important habitat for many species of birds and other wildlife. Public urban green spaces are often set aside to provide key terrestrial and aquatic habitat as the backbone for landscape ecological networks in metropolitan areas. However, a large propotion of green space in cities remains privately owned. Domestic gardens are a major component of cities, occupying approximately a quarter of the entire land area in cities studied in the UK (Evans, Newson, & Gaston, 2009; Gaston, Warren, Tompson, & Smith, 2005; Loram, Tratalos, Warren, & Gaston, 2007), and 36% of the total urban area in the city of Dunedin, New Zealand (Mathieu, Freeman, & Aryal, 2007). Private urban green spaces or "patios" comprised 85% of all urban green spaces in terms of surface area in the city of Leon, Nicaragua (González-García and Sal, 2008). In Baltimore, Maryland approximately 55% of the area of block groups studied and approximately 85% of unplanted area with potential for future planting was on private land (Grove et al., 2006; Troy, Grove, Jarlath, Pickett, & Cadenasso, 2007).

These private urban spaces can provide valuable benefits for both people and wildlife. Research and modeling suggest that private property contributes to avian habitat quality (Lerman et al., 2014). Modeling also suggests that private property contributes to urban connectivity and dispersal (Rudd, Vala, & Schaefer, 2002) or has the potential to (Parker, Head, Chisholm, & Feneley, 2008; Snep, WallisDeVries, & Opdam, 2011). A review of studies about the potential ecosystem services of gardens as green infrastructure components in the urban landscape included temperature regulation, energy conservation, stormwater runoff and flood attenuation, urban wildlife habitat, and human physical health benefits associated with domestic gardens (Cameron et al., 2012). Due to the proportion of urban gardens in urban areas, there is "substantial potential for them to contribute to city-wide biodiversity potential and ecosystem performance (Tratalos, Fuller, Warren, Davies, & Gaston, 2007, 314)."

One of the challenges for private property stewardship in cities is that the private property landbase is composed of many small parcels with many landowners. While it is possible to work on an individual basis with private landowners, ecological planning and management may have the greatest impact when conducted over a large area. One can imagine the potential benefits of coordinated, multi-parcel stewardship efforts guided by landscape-level analysis and planning. The need for new approaches to encourage beneficial habitat improvements on urban private property has been acknowledged for some time (Nassauer, 1997), but strategies to do so are relatively unexplored by planning and design professionals and in the academic literature. Goddard, Dougill, and Benton (2010) discuss 'top-down' and 'bottom-up' urban habitat conservation strategies on private land. Recent voluntary stewardship initiatives however suggest the potential for greater description and categorization of strategies for encouraging urban habitat stewardship on urban private land so that they can be better understood and implemented.

While voluntary incentive options for habitat stewardship on rural private property are relatively well documented (see for example Defenders of Wildlife, 2006; Doremus, 2003; Mayer & Tikka, 2006), strategies for encouraging voluntary urban stewardship are not well described. The urban environment, by virtue of its relatively small parcels and distributed ownership, poses a unique set of stewardship challenges and opportunities that are fundamentally different from rural areas. Yet surveys of public, non-governmental and private organizations indicate that a significant amount of urban ecological stewardship is being conducted on private property (Fisher, Campbell, & Svendsen, 2012; Svendsen & Campbell, 2008).

This paper investigates emerging initiatives and programs that encourage voluntary urban habitat stewardship in the matrix of private properties. It describes four strategies for urban stewardship practice: a) indirect incentives; b) market-based certifications; c) community-based initiatives; and d) payments for ecosystem services. Each strategy has the potential to combine the individual actions of multiple urban landowners in order to optimize the landscape-scale benefits of these actions in a concerted way. Perspective on each of these strategies in practice is provided from the academic literature where available. This paper also incorporates content from municipal and organizational reports and interviews to describe case studies that illustrate these strategies and how they work. In most cases, ecological improvement is either the primary goal of these programs, or an acknowledged secondary benefit. Components, methods and drivers are identified for each strategy to illustrate their application at the project level. Finally, we discuss the challenge of scale in optimizing ecological benefits in cities, and the potential for institutional partnering on multi-parcel, private property stewardship efforts to generate both site-scale and landscape-scale ecological outcomes.

2. Methods

Searches for documentation of voluntary cooperative stewardship efforts on private property were conducted with the ProQuest Summon Service. Combinations of search terms were used including: private, stewardship, initiative, cooperative, voluntary, urban, garden, parcel, lot, subdivision, neighborhood, habitat, ecological and ecosystem. Similar searches were also conducted in several topically-related journals (*Landscape and Urban Planning*, *Ecology and Society*, and *Urban Forestry and Urban Greening*). Searches specific to strategy topics and related theory were also conducted. Limited academic literature on voluntary cooperative stewardship efforts on urban private property was found; however as similarly described by Wilkinson, Sendstad, Parnell, and Schewenius (2013) when investigating urban governance of biodiversity and ecosystem services in the scientific literature, there was significant reporting in the "grey literature" outside of academia. While different in their scope, rigor, and perspective, these resources have the potential to contain valuable knowledge about how cities and urban communities are engaged in such stewardship (Wilkinson et al., 2013). We therefore followed up literature searches with web-based searches, news and newsletter readings, and interviews to find program examples of voluntary urban private property stewardship. Programs encountered during professional practice by the author were also incorporated. We sought program reports and documentation for the case studies, and conducted select phone interviews or email inquiries to fill in gaps in information. Phone