Rapid Review No.2 - Summary

How can urban development support biodiversity on private lands?

LOW CARBON LIVING CRC

Objectives of this rapid review

Urbanization is driving land use change and reducing biodiversity coverage worldwide. Increased density and the expansion of paved areas reduce the space available for biodiversity within city boundaries. With predictions of 80% of the human population living in cities by 2030, active efforts need to take advantage of the remaining space, such as public and private gardens.

Private green space in gardens plays an important role for protecting biodiversity and further, provides vital ecosystem services. While individual private gardens are too small to support viable populations, collectively, gardens can help retain species populations.

Local efforts to reduce biodiversity loss often lack the resources, political will or knowledge to succeed, with most efforts being inadequate to sustain viable populations of species. There is a lack of understanding of how to incorporate effective policies to support the retention of biodiversity on private land.

The aim of this rapid review is to examine the international literature on biodiversity conservation on private lands located in urban areas and collate best practices and recommendations applicable to Australia.

Key findings of this rapid review

The review found six studies, published between 2006 and 2017, that fulfilled the selection criteria for inclusion in the analysis. Two studies consisted of literature reviews and four were empirical research, which were included given the limited number of relevant articles in the subject area. The studies reported results from Australia, Brazil, Japan and the USA and addressed the following topics: incentives used to promote biodiversity in households; integration of private gardens in city-wide conservation strategies; and the influence of household characteristics in private garden biodiversity.

Gen Y Demonstration House and garden integrating property and streetscape spaces (photo by Rob Frith)

Incentives to encourage biodiversity conservation

Incentives for biodiversity conservation in urban private properties can be from a top-down (i.e. driven by government) or a bottom-up (i.e. driven by individuals) nature. In recent years there has been a move toward bottom-up approaches, which are individual or community-led initiatives. The most common incentives which can be implemented by local or state governments include:

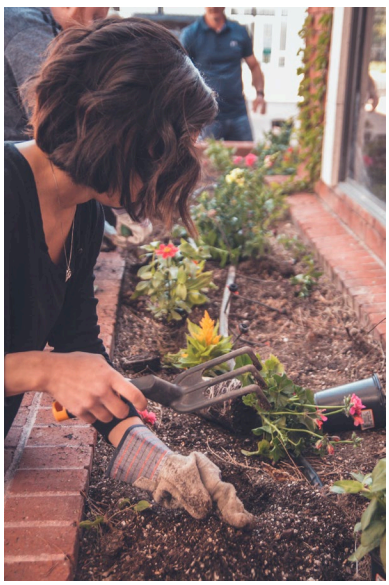
- Indirect financial incentives through tax reduction, government grants, subsidies, fee credit or development rights to owners who commit to restore or create green space on their properties.

Periodic monitoring and reporting obligations may be necessary.

- Payment for Ecosystem Services, consisting of payment made in cash or in-kind, to the owner of an ecosystem asset in exchange for its preservation. Agencies can assist in the design, implementation, enforcement and fundraising of the scheme. Periodic survey and reporting obligations may be necessary.

Species need a wider habitat to thrive … biodiversity conservation at a city level should include private gardens.

- Market-based certifications, formally recognizing that a development meets certain biodiversity standards. These can stimulate biodiversity conservation during site development and provide a competitive advantage to owners and developers. Certification is conducted by a third-party organisation and periodic monitoring and report may be necessary.
- Community-based initiatives, consisting in the engagement of private owners to manage and monitor their land to support biodiversity. Participants experience a sense of contribution towards the community and benefit from landowner relationships and social cohesion. Recruitment is through a community organisation or an NGO who assist in the provision of technical support and long-term monitoring. No formal incentives are provided.



Woman planting (https://unsplash.com/photos/QMj47_NSmfs)

Integration of biodiversity conservation at different scales

Biodiversity is enhanced with connectivity as many species need a wider habitat to thrive. For maximisation of biodiversity, it is important that the management of private gardens is coordinated with the surrounding landscape, including the neighbourhood and the wider city. The following actions to maximise city-wide biodiversity are recommended:

- New developments should spatially arrange private gardens and green public spaces to maximise total habitat patch area.
- Biodiversity conservation at a city level should include private gardens and promote habitat heterogeneity.
- Householders and stakeholders operating at different scales should be given different tailored, but complementary, gardening advice.
- Residents should be given education and support to get involved in community and city-scale schemes.

Voluntary strategies provide a way of including private gardens into wider conservation strategies and at different city scales.

Ringneck Parrot in a nesting box (photo by Mandy Bamford)

Household characteristics and behaviours as influencing factors

Household characteristics and individual behaviours have been shown to correlate with the amount of biodiversity on private properties. Biodiversity on private lands increases with wealth, home value,

household size, marriage rate, lower density, high school graduation rate, proximity to public green spaces and home ownership. Likewise, investment in garden maintenance is positively influenced by income, home value, the median age of residents, household size, home ownership, and low density. Property age was also found to correlate with the amount of vegetation cover in private gardens, with vegetation abundance peaking between 40 to 50 years, then gradually decreasing.

One study found that lifestyle behaviour was the main predictor of vegetation cover on private lands. This refers to the social identity of the household and how residents associate social status with their lifestyle. Lifestyle behaviour is associated with land management decisions, which is influenced by social norms. Consequently, neighbouring houses usually have gardens that are similar to each other.

Although the findings relating to household characteristics and behaviour may be culture and/or context specific, they show that one-size fits all strategies may not be suitable when devising conservation programs.

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Marketing and communication strategies to promote conservation on private lands should be tailored and targeted at different groups, taking into account specific lifestyle behaviour, demographics and motivations. Insights into household characteristics can also inform how to select the most adequate incentive strategies as well as how financial resources could be distributed to encourage biodiversity in specific residential areas.

Street verge planting with native species (photo by Patrick Schutler)

Summary and next steps

In order to support and maximise biodiversity on private lands, urban developments need to coordinate efforts at a wider city-scale, promoting habitat connection and garden heterogeneity; provide households with adequate education and support; and develop incentive strategies that align with specific household characteristics and behaviour lifestyle.

It is recommended that these solutions are developed and tested in collaboration with new residential communities.

Studies reviewed

[1] J.F. Cerra, Emerging strategies for voluntary urban ecological stewardship on private property, Landscape and Urban Planning 157 (2017) 586-597.

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[6] A.R. Troy, J.M. Grove, J.P. O'Neil-dunne, S.T. Pickett, M.L. Cadenasso, Predicting Opportunities for Greening and Patterns of Vegetation on Private Urban Lands, Environmental Management 40(3) (2007) 394-412.

Disclaimer

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