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Australian native gardens: Is there scope for a community shift?

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HIGHLIGHTS

- The general public is largely in favor of planting native vegetation and a large number would like wildlife in their yards.
- The public perception of the aesthetic appeal of native gardens is fairly positive.
- There is scope to encourage the use of native plants in residential landscaping.

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ABSTRACT

The negative impacts of urbanization on biodiversity are well known, and the use of native vegetation in private gardens and streetscapes have been shown to improve the species richness and abundance of native wildlife, thereby improving the biodiversity of the local area. This study poses the question of whether the general public is interested in planting native species, to determine whether a cultural shift in garden planting style is feasible. A total of 3707 questionnaires relating to nature in the backyard were delivered to residents in metropolitan Melbourne, Australia with 417 responses received (11.2% response rate). The results indicate that the public perception of the aesthetic appeal of native gardens is fairly positive and that Melbournians have considerable interest in planting native species in residential gardens and that a large number would like wildlife in their yards. The paper concludes that there is scope to encourage the use of native plants in residential landscaping.

1. Introduction

It is well known and accepted that urbanization negatively impacts biodiversity by fragmenting and reducing native vegetation, which leads to a reduction in native wildlife (Collinge, 1996). However it is not just the initial development that has negative impacts on biodiversity, the way in which residents maintain their gardens has an impact on the local biodiversity (Hostetler, Allen, & Meurk, 2011). Across the developed world non-native ornamental plant species have come to dominate gardens and the residential landscape, due to their popularity amongst residents and landscapers (Burghardt, Tallamy, & Shriver, 2009). For example, approximately 70% of vegetation in United Kingdom gardens is not native (Loram, Thompson, Warren, & Gaston, 2008).

Given the benefits of native vegetation to urban biodiversity, and the detrimental effects of exotic vegetation, this trend is not ideal. For example, non-native plant species can contribute to the spread of invasive weed species into remnant bushland. In the state of Victoria, Australia, a great threat to biodiversity is the prevalence of weed species. Weeds have invaded most of the native bushland remaining in the capital city Melbourne, and the main source of these weeds is private gardens (Commissioner for Environmental Sustainability, 2008).

Urbanization has been shown to decrease the overall diversity, abundance, and species richness of terrestrial animals; however studies often show that while bird richness and diversity decline with urbanization, bird abundances often increase (Faeth, Bang, & Saari, 2011). In North American studies this is most often attributed to increases in nonnative bird species and a few native species that are urban adapters or exploiters (Faeth et al., 2011). These findings are in line with the hypothesis that indigenous vegetation better supports native wildlife compared to exotic vegetation (Burghardt et al., 2009; Ikin, Knight, Lindenmayer, Fischer, & Manning, 2013; White, Antos, Fitzsimons, & Palmer, 2005). French, Major, and Hely

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(2005) support this hypothesis in their finding that Australian suburban nectarivorous birds prefer to forage in native species compared to exotic species. White et al. (2005) studied differences in urban bird assemblages in Melbourne, Australia, and found lower bird species richness and abundance in streetscapes characterised by exotic vegetation. The authors explained that urban environments dominated by non-native vegetation are able to support simplified bird communities consisting largely of non-native species but that environments dominated by structurally diverse native vegetation are able to support more complex bird communities consisting largely of native species. They concluded that 'the implementation of effective strategies and incentives that encourage the planting of native vegetation in streetscapes and gardens should be paramount' (White et al., 2005, p. 133).

To this end, residents' private gardens constitute a largely untapped resource that could be utilized to help improve the biodiversity of urban environments. Indeed, a large body of evidence suggests that members of the community can play a significant role in supporting wildlife populations through the planting of native plant species in their gardens (Bland, Tully, & Greenwood, 2004; Chamberlain, Cannon, & Toms, 2004; Daniels & Kirkpatrick, 2006b; Davies et al., 2009; Doody, Sullivan, Meurk, Stewart, & Perkins, 2010; French et al., 2005; Goddard, Dougill, & Benton, 2013). There have been attempts through legislation and policy to encourage residents to retain native vegetation on their properties, for example, through the *Environment Protection and Biodiversity Conservation Act 1999,* and Victoria's *Planning and Environment Act 1987, Flora and Fauna Guarantee Act 1988, Permitted Clearing of Native Vegetation – Biodiversity Assessment Guidelines* among others. At the time of writing, the Victorian Government is developing a new *Biodiversity Strategy* and reviewing associated policy regarding native vegetation.

Large urban green spaces such as parks or bushland reserves can help sustain urban wildlife populations as they tend to support higher levels of biodiversity and can provide important habitat for a range of species (Rudd, Vala, & Schaefer, 2002). However, preserving isolated urban green space may be of limited biodiversity benefit, as without connections between them, dispersal and gene flow is restricted (Hobbs, Saunders, & Hussey, 1990). Urban parks can also be quite degraded and continue to be disturbed by human activities. As domestic gardens comprise a geographically widespread proportion of urbanized areas (Loram et al., 2008), private gardens are seen as essential to developing wildlife corridor connectivity in urban areas (Rudd et al., 2002), and hence there is a need to encourage the planting of native species to maximise biodiversity conservation. However, is the general public interested in planting native vegetation in their gardens?

Despite hundreds of studies, no definitive answers have been found to explain the gap between environmental attitudes, awareness and knowledge, and pro-environmental behavior (Kollmuss & Agyeman, 2002). For example, one may be aware that urbanization reduces native vegetation, but they do not engage in the pro-environmental behavior of planting native vegetation. Various theoretical frameworks have been put forward to try and explain this gap, all of which have some validity in certain circumstances. Kollmuss and Agyeman (2002) have suggested the drivers of pro-environmental behavior cannot be visualized through one single framework as they are too complex. However, research has identified a number of factors that appear to influence gardening choices, and these are therefore important to consider in the context of creating a community shift towards native gardening.

The literature typically depicts gardens as sites of human activity where nature is shaped by people according to their culture, ideas and actions (Power, 2005). Gardens have been understood to reflect changing social patterns (Caldicott, 1997), marketing influences, environmental knowledge (Head & Muir, 2005), socio-economic status (Daniels and Kirkpatrick, 2006a; Kirkpatrick, Daniels, & Zagorski, 2007), aesthetic preference, and social norms (Nassauer, Wang, & Dayrell, 2009). To be successful in encouraging people to adopt native gardens, efforts would have to address the cultural norms and conventions that structure residential landscapes (Nassauer et al., 2009). Parsons (1995) suggests that there is considerable potential for conflict between ecological sustainability and aesthetics in landscape design. For example, native gardens may prove difficult to promote as they do not fit the public's view of 'aesthetic appeal' (Beck, Heimlich, & Quigley, 2002). The pressure to conform to mainstream perceptions of having a conventional looking garden can be strong (Beck et al., 2002; Goddard et al., 2013; Peterson et al., 2012) and Nassauer et al. (2009) point out that in metropolitan America, ecologically minded landscapes are not yet typical and suggest that widespread adoption of such yards faces the barrier of perceived norms favoring conventional landscape designs.

Environmental attitudes and values have also been shown to influence gardening preferences. There are numerous studies on attitudes toward gardening and gardens (Head & Muir, 2004, 2005; Head, Muir, & Hampel, 2004; Lohr & Pearson-Mims, 2005; Peterson et al., 2012; Zagorski, Kirkpatrick, & Stratford, 2004) and studies show that gardens are important as a place for interacting with nature (Clayton, 2007; Gross & Lane, 2007; Power, 2005). There are fewer studies focusing on attitudes toward the use of native plants in gardens (for exceptions see Goddard et al., 2013; Kiesling & Manning, 2010; New South Wales National Parks and Wildlife Service, 2002; Zagorski et al., 2004). The Zagorski et al. (2004) study found a strong relationship between gardeners' values and the species composition of their gardens, with those holding conservationist views more likely to have native gardens, and indicate that continuing work on the causes of variation in garden vegetation is required. A study by Kiesling and Manning (2010) examined how Clayton's (2003) Environmental Identity Scale (which measures the extent to which an individual considers nature to be an important part of their self concept) could explain differences in the gardening behavior of home gardeners in a Midwestern U.S.A. metropolitan area and found that the scale correlated with ecological gardening practices. Other researchers have failed to find a link between environmental values and environmentally sensitive gardening practices (Goddard et al., 2013; Larson, Casagrande, Harlan, & Yabiku, 2009; Larson, Cook, Strawhacker, & Hall, 2010). Although these studies examine gardeners' relationships with and attitudes toward their gardens, what appears to be lacking is research on future intentions to utilize native plants in domestic gardening.

As mentioned earlier, if there are to be attempts to encourage the general public to plant native vegetation in their gardens, then it must be first ascertained how receptive the community is to the idea. This paper examines the willingness of the general public, in metropolitan Melbourne, Australia, to plant native species in their gardens, with the aim of determining whether attempts at encouraging widespread native planting by the community could be successful.

2. Method

Based on the results of a pilot questionnaire, a survey consisting of 30 questions was designed to investigate respondents' views about nature in the backyard, including native vegetation and wildlife. The survey began with a covering letter and consisted of the following sections:

A *Nature in your yard.* This section sought information about the composition of the respondent's yard, the reasons they chose either native or non-native plants, their preferred type of yard,