

A Formative Evaluation Technique for Analysing Biodiversity in Order to Aid Residential Property Credential

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Abstract

Householders can be informed and incentivized to improve native biodiversity in their urban properties through residential property certification schemes, but the certification process necessitates the development of a robust biodiversity evaluation tool. To create a tool to evaluate residential property biodiversity, we used a modified Delphi process and conjoint analysis to identify and rank features associated with biodiversity. We assessed its performance in 89 residential properties on New Zealand's South Island. The assessed property sizes ranged from 260 m² to 7195 m². Biodiversity scores ranged from 10 to 52 out of a possible 100, indicating the difficulty in achieving a score higher than about 60. The relationship between property size and biodiversity score was positive but variable; however, all properties 500 m² and smaller had scores less than 30, indicating the need for a size-specific rating system for smaller properties.

Keywords: Biodiversity; Urban properties; Landscape

Introduction

Even in highly modified landscapes such as urban areas, biodiversity contributes to ecosystem functioning and the generation of ecosystem services, and it can also improve human health and well-being. However, biodiversity loss due to extensive habitat modification has resulted in lower densities and homogenization of fauna and flora in urban areas. Green infrastructure networks of public and private green spaces are among the strategies for increasing biodiversity in cities. Residential properties account for a large proportion of urban green space in most cities, accounting for between 20 and 27% of the total area in seven UK cities, and they have the potential to contribute significantly. Small actions taken by a large number of homeowners on their properties can add up to provide habitat for a variety of wildlife species. [1, 2].

The relative importance and weights of high-level residential property attributes

Existing biodiversity survey methods are mostly too complex for quick assessments that can be easily communicated to non-specialists. Tzoulas and James (2010) developed a rapid assessment tool for urban habitats larger than one hectare as an example. This tool takes into account factors such as vegetation structure, vascular plant diversity, and built area, but it is ultimately aimed at a larger scale than most individual residential properties. The structural composition of habitats is a proxy for biodiversity. However, vegetation extent, composition, and structure, as well as habitat features, can serve as indicators of biodiversity in general. There is a link between vegetation cover or volume and faunal diversity, particularly for co-evolved plants, invertebrate herbivores, and amphibians. In the case of invertebrates, ecological surveys commonly assume that invertebrate diversity is reflected in plant diversity, particularly in native species. [3, 4]

Residential property design is likely to be a critical indicator of property biodiversity in properties of all sizes; features such as tree height, diversity of land covers, rockeries, composting, hedges, dead wood, bare ground, shrubs, and grasses all influence the availability of animal resources. It has been discovered that feature diversity is a predictor of biodiversity. Larger properties are more likely to have more diverse features, implying that the proportion of vegetated area

is also likely to be important, though trends toward mass planting and limited plant palettes can result in minimal biodiversity even on large properties. Invertebrate and plant diversity are also influenced by management practices such as lawn mowing intensity (Watson et al., 2020) and pesticide use. The biodiversity that properties support is thus determined by a variety of factors such as size, vegetation, design, and management. [5, 6, 7].

Discussion

We developed a tool for assessing a property's potential for supporting biodiversity, particularly native biodiversity, by guiding the TAG through a step-by-step process of identifying and weighting important relevant features of residential properties. Our pilot study demonstrated that this tool could be used by assessors in a practical and reliable manner, eliminating the need for detailed taxonomic surveys and meeting our objectives (Table 3). The weighting of the high-level property [8, 9].

Conclusion

The WY, however, was greater than that of the non-coastal zone. According to time distribution, Sanya's ecosystem services declined less from 2010 to 2018 than they did from 2000 to 2010, showing that the city has clearly seen the benefits of ecological preservation measures in recent years and that the declining trend of ecosystem services has slowed. (3) The natural environment had the biggest impact on Sanya's ecosystem services, but tourism increasingly had a bigger impact as well. A trade-off between Sanya coastal tourism and ecological services was discovered; the core density of the four tourist components was

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favourably connected with WY and negatively correlated with SR, CS, and HQ. Tolerating trade-offs between ecological preservation and tourism growth. Additionally, logical dynamic planning and rigorous dynamic monitoring must be put into practise. To close the ecosystem service gap between coastal and non-coastal zones, the protection of coastal areas and the buffer zones around them should be strengthened [10].

Acknowledgement

Our research responds to an urgent need to educate householders about the important contribution their private residential properties and neighbourhoods can make to city-wide biodiversity and ecosystem services in New Zealand and around the world. Given that rising demand for affordable housing will result in densification and infill development, it is becoming increasingly important to maximise the biodiversity value of remaining larger properties.

Conflict of Interest Statement

The author affirm that they have no known financial or interpersonal conflicts that would have appeared to have an impact on the research presented in this study.

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