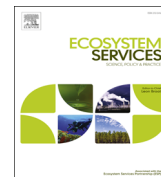




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Does diversity matter? The experience of urban nature's diversity: Case study and cultural concept



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ABSTRACT

In everyday life, urban green spaces are *the* places for nature experience and recreation for urban residents. A *diverse* urban nature is generally seen to be able to promote both biodiversity conservation as well as the enhancement of the quality of urban life. But how important is nature's diversity really for residents? There are various studies about the services of urban green, but still gaps in the knowledge of the user's experience and valuation of nature's diversity. This paper discusses, first, the results of interviews on the perception and valuation of species and structural diversity of an urban green space. Most respondents assessed the diversity as (very) high and consider biodiversity in general as (very) valuable, yet few specific structures and species were named. Second, we explain this mismatch referring to the cultural ideal of landscape diversity in the German-speaking region, which we believe to influence the experience of nature. People use 'diversity' to express their feeling of well-being during their stay at a given site rather than an objective assessment of number of species or elements. In this way, we place the topic of individual perception, experience and valuation of urban nature's diversity in a philosophical and historical-cultural context.

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1. Introduction

For urban residents, the experience of nature and nature-related leisure in the everyday life largely takes place in public urban green spaces. Urban nature right at the front doorstep enriches and inspires life by hosting a high diversity of plants and animals attractive for people (e.g. Millard, 2010). In this regard, important goals of urban green space management are to provide natural features as well as man-made facilities and amenities that offer visitors satisfying leisure activities and nature experience by providing near-natural habitats and protecting biodiversity. Meeting these goals is not easy, especially in urban areas where space is limited, demand on and use of green space is high, and demands, desires and activities are very diverse due to a diversified society. An important basis for providing a high multitude of alternatives of activities and nature experiences is certainly the size and number of green spaces, but also the diversity of and within urban green spaces regarding biotic and abiotic features besides man-made facilities for sport and relaxation (Voigt et al., 2014). Generally stated, a *diverse* urban nature is seen to be able to promote both biodiversity conservation (CBD COP, 2010) as

well as the enhancement of the quality of urban life by offering opportunities for diverse nature experiences, closeness to nature and leisure opportunities (Kaplan, 1983).

While there is a lot of research on the cultural ecosystem services of urban green for city residents especially on recreation (e.g. Chiesura, 2004), there is a lack in research on the perception, experience and valuation of urban nature's *diversity*. Moreover, various authors criticize that important value content has been sidelined in ecosystem service research and practice. In respect to cultural services, they see most values as intangible, incommensurable, and not measurable by methods such as cost-benefit or willingness to pay (Satterfield et al., 2011; Chan et al., 2012). Values given to urban nature – e.g. in respect to the opportunities to enjoy fresh air and sun, to get away from daily routine, to experience freedom from constrictions, constraints and conventions of modern urban life, or to take delight in natural beauty – result from individual experiences or central elements of worldviews (Kirchhoff et al., 2012).

We are especially interested to know whether urban residents perceive the diversity of green spaces in everyday life at all. If so, what kind of diversity and/or which diversity components (species and landscape elements) do they perceive? How important is diversity for them? What do people mean by 'it is diverse'? Is the designation of the nature of an area as being 'diverse' the outcome of a more or less realistic assessment of its species diversity, or do people use the term for describing the subjectively perceived quality of the site and/or their

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pleasure of being there? To answer these questions, we join different approaches. First, we investigated the perception and appreciation of diversity in the everyday experience of a city's residents in a near-natural recreational area in the city of Salzburg. To assess the given natural diversity, we mapped the site. To capture the perception and valuation of the visitors, we conducted an interview survey with a focus on the perception of the diversity of species and of structural landscape elements. Second, to explain our results, we discuss them in light of the concept of diversity which took shape in the eighteenth century and still influences the experience of landscape and nature today. In this way, we place the topic of individual perception, experience and valuation of urban nature's diversity in a philosophical and historical-cultural context. Thereby, we follow the argumentation of Chan et al. (2012), that the effectiveness of the ecosystem service framework in decision-making is thwarted by the conflation of services, values, and benefits, and the failure to recognize the importance of different kinds of values for valuation and decision-making, particularly with regard to cultural ecosystem services. Cultural ecosystem services such as nature experience cannot be defined without regarding people's cultural values and the symbolic meanings they attach to the natural environment.

2. Urban nature's diversity in ecological and social perspectives

In urban regions, there are more people, less space, and a greater diversity as well as intensity of competing interests, requiring appropriate management of urban green spaces and their biodiversity to ensure the well-being of and nature experience for city residents. Managing nature's diversity is complex and has to consider ecological as well as socio-cultural fundamentals. In the following, we give a short overview on the related research in the respective disciplines.

How to define and measure 'diversity'? In ecology, diversity is recognized as an important characteristic of ecological systems; in addition, it is a main issue in landscape planning and nature conservation. However, diversity does not have a single, unequivocal definition. In these fields, the term diversity is used usually in the context of 'species diversity'. In ecological literature, dozens of diversity definitions and indices are proposed, mostly weighting the characteristics 'species richness' (number of species present) and 'evenness' (the relative proportions of the constituent species) differently (Magurran, 2004). Also the term 'biodiversity' has been defined in various ways (Salwasser, 1990), but it generally refers to the totality of genes, species, and biocoenoses or ecosystems within an area (CBD, 1992). The term 'landscape diversity' often refers to the variability of the system's properties, e.g. the number of vertical layers of a forest and the abundance of vegetation (Magurran, 2004) or to the diversity of plant communities making up the vegetative mosaic of a land unit (Romme and Knight, 1982). In landscape planning, metrics used to measure landscape diversity (e.g. for the assessment of the appropriateness for recreation) are, for example, patch or edge density, geomorphological relief energy, number of direction changes of linear landscape elements, number of single elements such as hedgerows and trees that structure and segment the landscape (e.g. Kiemstedt, 1967).

Urban nature is also a topic in social science. While there is a lot of research on the value and the importance of urban green for city residents, there is especially a lack in research on the specific perception and valuation of urban (*bio*)diversity (Dearborn and Kark, 2010). Social research regarding biodiversity provides general insight into the awareness level of the term 'biodiversity' as well as in whether and how the loss of biodiversity is valued (e.g. Flash, 2007; Lindemann-Matthies and Bose, 2008). Nevertheless, even if a lot of people do not know exactly what 'biodiversity' means and have little interest and knowledge in species identification (Balmford et al.,

2002; Bebbington, 2005; Dunning, 1997), most recognize the loss of biodiversity as a dire problem and see the need for protection (Flash EB, 2007; Lindemann-Matthies and Bose, 2008).

Urban green spaces provide important cultural ecosystem services for urban residents. Social research in this field focuses usually on visitors or potential visitors, their demands on and the assessment of the respective green space, their leisure activities as well as their experiences, satisfaction, and conflicts in these places (e.g. Chiesura, 2004; Loukaitou-Sideris, 1995; Tyrväinen et al., 2007). Regarding the supply of different recreational services, most studies concentrate on objective measures and/or on the residents' self-reported perceptions of qualities seen as important for encouraging green space use such as size, proximity, facilities, and amenities (e.g. Cohen et al., 2010; Gobster and Westphal, 2004) or of characteristics that prevent visits such as reduced safety or poor park maintenance (Gobster, 2002; McCormack et al., 2010; Schroeder and Anderson, 1984). However, most studies and instruments regard the facilities for physical activities only; they miss out assessing biotic and abiotic conditions, and therefore aspects that may promote other cultural services (Voigt et al., 2014).

Only a few studies have examined the perception and valuation of urban green spaces' natural (biotic and abiotic) features (e.g. More, 1985; Schroeder and Anderson, 1984; Voigt et al., 2014) although their influence on well-being regarding physical, sensory, or psychological functions as well as aesthetic and symbolic values is often postulated (e.g. Smardon, 1988). In a previous study about perception, valuation and use of different urban parks (Voigt et al., 2014), we showed that beauty and naturalness are important properties for urban park visitors; attractiveness of plants and animals is of less importance. Surveys on the influence of urban species richness on well-being have contrasting results: the psychological well-being of urban park visitors in Sheffield was positively correlated with the species richness and habitat diversity (Fuller et al., 2007). Also, aesthetic appreciation increases with species richness and evenness (Lindemann-Matthies et al., 2010). In contrast, Dallimer et al. (2012) found no consistent relationship between self-reported well-being and actual species richness (plant, butterfly, and bird species). The well-being even decreased with increasing plant richness. Interestingly, visitors gained well-being from locations that they *believe to be species diverse*, even if they were unable to identify which locations are actually more diverse. The latter survey shows how important the perception and valuation of nature as being diverse is for well-being. Other findings also confirm the influence of subjective perception. The perceived overall neighborhood greenness (Sugiyama et al., 2008) is found to be conducive to physical activity since there is no association between physical activity and the objectively derived greenness obtained from satellite imagery (Leslie et al., 2010). For us, these findings lead to the question of the relation between scientifically measured and perceived natural diversity as well as to the question of the importance and meaning of diversity.

3. Methods and case study site

The study site is located in the city of Salzburg, Austria. With about 150,000 inhabitants, it is the fourth-largest city in Austria. Its administrative area covers 6567 ha, of which about 58% is green and blue (including farmland and forests), 34% consists of built-up areas and almost 8% is dedicated to transportation infrastructure (Magistrat der Stadt Salzburg, 2013). This great amount of green in the city is mainly a result of a special conservation status of urban agricultural land ('Grünlanddeklaration'). The survey took place at the 'Salzachseen', a cluster of man-made water bodies from tiny ponds to proper lakes surrounded mostly by woods and meadows. Originally, the landscape was dominated by riparian forest of the Salzach River. The lakes were created by gravel mining in the

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