



# How deep is your love – Of nature? A psychological and spatial analysis of the depth of feelings towards Dutch nature areas



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## ABSTRACT

The most binding nature protection policy in the Netherlands and the EU primarily designates areas based on ecological value, ensuring their sustained protection. Of less concern to these policies are the current and future needs of the average citizen, who is experiencing increases in education, income, and health. This paper argues that although existing policies protect biodiversity needs, the spatioemotional needs of the public are of similarly high importance. We analyze the spatial and emotional characteristics of favorite natural places in the Netherlands selected on the Hotspotsmonitor survey. Content analysis of the open question, "Why is this place important to you?" identified three categories: peace & quiet, explore, and peak. These were mapped using GIS to identify predominant hotspots and compared against the most binding nature protection policy - Natura 2000. The important societal benefits of augmenting ecologically based nature protection policies with emotional valuation are discussed.

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## 1. Introduction

What nature is protected now and in the future are critical questions in land-use policy (Foley et al., 2005; Wu, 2013). Of equal importance is *why* nature is protected – the purpose behind the policy (Coeterier, 1996). However, currently, measures that support protecting nature for biodiversity value are far more developed than those for psychological appreciation (European Environmental Assessment (EEA), 2009; 2012; Milcu, Hanspach, Abson, & Fischer, 2013).

In the aim to deepen our understanding of nature protection and public appreciation, the present paper investigates the relationship between biodiversity protection and the psychological appreciation of natural areas. Our study combines macro scale mapping of attractive nature areas and policy boundaries (Sijtsma, Daams, Farjon, & Buijs, 2012) with a micro scale study of individual psychological nature experiences. The paper seeks to assess whether and to what extent highly attractive natural areas overlap

with areas that are officially 'protected' for their biodiversity value. A key part of our assessment is to explore more deeply how nature areas differ in the extent to which they reflect distinct categories of emotion. Focusing on the Netherlands, we contribute to what Alessa, Kliskey & Brown call 'socio-ecological hotspot mapping,' known as the investigation of areas of spatial representations of social and ecological convergence (2008, p. 27).

### 1.1. Nature protection and public appreciation

Biodiversity is declining at the global and the European level (Chapin et al., 1998; Dobson, 2005; Millennium Ecosystem Assessment (MEA), 2005; Smith et al., 2000; Swift et al., 1998). To prevent further losses, the European Union (EU) has created an ecological network of nature conservation areas, entitled Natura 2000, which was established under the Habitats Directive (92/43/EEG) and Birds Directive (2009/147/EG). The purpose of this policy is to assure the long-term survival of Europe's most valuable and threatened species and habitats (EU Council Directive, 1992). Protected habitats include mostly natural, but also some areas with human impact, such as traditional farmland (Evans, 2006; Martinez, Ramil & Chuvieco, 2010). Although 17% of Europe has been designated as a Natura 2000 area, 60% of protected species

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and 77% of protected habitats have an unfavorable conservation status (EEA, 2015), in large part due to environmental pressures such as habitat fragmentation, climate change, intensive land use and inappropriate management (Balmford et al., 2005; Chapin et al., 2000; Mack et al., 2000; Thomas et al., 2004). In the Netherlands, only 23% of species and 4% of habitats have a favorable status (EEA, 2009).

The restoration of favorable conservation status requires action in various sectors by different parties. To gain public acceptance and involvement, information on how much and why the public appreciates nature areas is important and worthy of serious consideration (Smith, Davenport, Anderson, & Leahy, 2011). The current Netherlands Natura 2000 policy has been criticized as too technocratic as it focuses only on ecological protection (BIO Intelligence Service, 2011). Recent research finds that some successful Natura 2000 sites have nationally mandated local management and engagement (Petrosillo, Zaccarelli, Semeraro, & Zurlini, 2009). However, words like 'biodiversity' and 'Natura 2000' are still not commonly known to the wider public (European Commission (EC), 2013). To increase citizen knowledge of the value of biodiversity for human well-being, policy efforts have been taken to promote the identification, mapping, and valuation of ecosystem services (Maes et al., 2012). The Millennium Ecosystem Assessment (MEA) identifies four ecosystem services - provisioning, regulating, supporting, and cultural (2005). Cultural ecosystem services are most relevant to this study as a proximate measurement of nature appreciation and 'well-being.'

Cultural ecosystem services are defined as the "nonmaterial benefits people obtain from ecosystems," such as aesthetic and spiritual appreciation, or, reflection and recreation (MEA, 2005, p. 40). Although these services are most directly related to the current needs of the wider public, they are reportedly in decline and are often not properly considered in real decision contexts (Gee & Burkhard, 2010; Schaich, Bieling, & Plieninger, 2010; MEA, 2005). While the Natura 2000 policy does not turn a blind eye to human needs (i.e., some sites allow recreation), site designations do not consider cultural services such as aesthetic and spiritual emotions in nature. As such, the extent to which public appreciation of nature areas overlaps with Natura 2000 areas, and what that appreciation looks like, remains an open question.

When viewed from a long-term planning perspective, this question is further amplified considering that, on average, European citizens are experiencing greater life expectancy, education attainments, and health outcomes (EC, 2010; Malik, 2013). In particular, the Netherlands Human Development Index score ranks among the top in the EU in maintaining a healthy, high-income, and well-educated population (Malik, 2013). In this paper we build conceptually on the human development idea, which asserts that when basic physical and social needs are met, non-materialistic values and growth needs such as self-actualization and transcendence may become more important (Inglehart, 1995; Maslow, 1970). The ecosystem services of nature and landscape may therefore have 'shifting roles' in human development over time. In the early stages, when basic needs are of primary importance, provisioning services (e.g. food from agricultural production) may dominate development and nature appreciation; whereas later, cultural services such as nature experiences may also become prominent. The implication is that, over time, shifts in development may lead to shifts in why we appreciate nature - i.e., first for food and then later for food as well as aesthetic appreciation and emotional nature experiences.

## 1.2. Understanding nature experiences

Previous research has identified and/or grouped nature

experiences in various ways.<sup>1</sup> One commonly adopted framework measures our immediate response to nature on a grid of two bipolar dimensions: pleasant to unpleasant and low-to-high arousal. Here, a pleasant high arousal response could be excitement (Russell, Weiss, & Mendelsohn, 1989) and a pleasant and low arousal nature experience could be relaxation, or, peace and quiet - emotional experiences commonly reported in nature (Davis & Gatersleben, 2013; Korpela & Hartig, 1996; Pearce, 2005; Tyrvaäinen, Makinen & Schipperijn, 2007). Other frameworks suggest nature experiences may exist on a continuum where one experience allows for another such as clearing away thoughts, or being away (escaping physically or psychologically daily routines) allowing for deeper contemplation (Hartig, Mang, & Evans, 1991; Kaplan, 1995; Korpela, Ylén, Tyrvaäinen, & Silvennoinen, 2008). Being away is a feature of Attention Restoration Theory (ART), a theory which posits that exposure to four restorative components of nature can recover depleted cognitive resources and increase positive emotions. These components are: being away, compatibility between the environment and the visitor's goals, a sense of fascination, and extent, defined as the realization that one's immediate environment is connected and has scope, allowing for exploration (Hartig et al., 1991; Kaplan & Kaplan, 1989; Kaplan, 1995; Staats & Hartig, 2004; Van den Berg, Jorgensen & Wilson, 2014; Ward-Thompson, 2011).

Along these same lines, time in nature can increase a sense of freedom through exploration and vitality (Hartig et al., 1991; Ryan et al., 2010). Research has found that confronting challenges in nature can lead to a sense of mastery and competence (Herzog & Strevey, 2008; Kaplan & Kaplan, 1989). These more physical nature experiences can induce higher levels of arousal.

Finally, people also report transcendent or spiritual experiences in nature (Kler, 2009; Maslow, 1970; Williams & Harvey, 2001), representing 'higher' nature values (Sijtsma, van der Heide, & van Hinsberg, 2013). These experiences tend to be infrequent (James, 1902; Maslow, 1970) and can include a sense of unity, timelessness, and harmony (Csikszentmihalyi, 1992; Williams & Harvey, 2001). These experiences also tend to occur in more varied, wild, or remote natural environments (Davis & Gatersleben, 2013; Williams & Harvey, 2001), and can inspire environmental perspectives (Fredrickson & Anderson, 1999; Kaplan & Kaplan, 1989).

Building on the suggestion of Sijtsma et al. (2012) that there appear to be large nature areas in the Netherlands that inspire 'deeper feelings,' this paper aims to specify and map distinct emotional nature experiences and compare them against Natura 2000 sites which are protected for their biodiversity. Building on the theoretical work discussed above, we categorize the open ended micro data of respondents' statements of why they find a nature area attractive and combine it with macro level mapping techniques (see Method section).

Mapping cultural ecosystem services in a scalable manner is a challenging task that requires working across disciplines and scales. Researchers have mapped attractive natural places (Bijker, Mehnen, Sijtsma, & Daams, 2014; De Vries et al., 2013; Sijtsma et al., 2012), well-being (Brereton, Clinch & Ferreira, 2008; Pellenburg & Van Steen, 2011), nature values and preferences (Ribiero, Migliozzi, Incerti, & Correia, 2013; Tyrvaäinen et al., 2007). Still, more work needs to be done connecting macro and micro scale measures. On the one hand, the majority of nature experience research relies on established quantitative scales and analyses are

<sup>1</sup> We use the term 'nature experiences' broadly in reference to research on experiences in nature, including work on the health and psychological benefits of nature, such as increased positive emotion (e.g. Berto, 2005; Hartig, Evans, Jamner, Davis, & Garling, 2003).

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