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Conference Abstract

A socio-ecological study on a citizen-based initiative to transform urban lawns into meadows within the Helsinki metropolitan area

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Abstract

The ongoing loss of biodiversity worldwide, in addition to the increasing levels of urban sprawl and urbanisation, can further decrease the chances of human-nature interactions in cities, and hence reduce the interest and support for nature conservation initiatives. Understanding the impacts that pro-environmental initiatives can have in the context of human-nature interactions, as well as the citizens who engage in these types of endeavors is therefore necessary to avoid any increasing apathy towards nature conservation among the public.

As part of an initiative within the Helsinki metropolitan area, Finland, to transform lawns belonging to student housing associations into meadows, we developed a survey to explore residents' attitudes towards both types of greenspace settings. In addition, we also measured respondents' environmental identity and concern, as well as their experiences of nature. In order to measure the respondents' experiences of nature, we

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further developed a pool of 26 items and scaled them within six proposed dimensions: observing/interacting, consumptive/appreciative, self-directed/other-directed, separate/integrated, solitary/shared and positive/negative (Clayton et al. 2017).

As part of the initiative, six lawns within the housing premises were also transformed into meadows via voluntary participation (Trémeau et al. 2024), by turning the existing soils upside down and sowing a mixture of domestically-grown pollinator-friendly seeds. We measured changes in vegetation, pollinator and soil microbial parameters, dynamics of carbon dioxide, methane and nitrous oxide fluxes, as well as soil physicochemical properties between control lawns and the transformed meadows over three consecutive years, starting a year before the transformations.

Before the lawn transformations took place, we identified 26 and 23 plant species in control lawns and lawns to-be-transformed, respectively, both cases sharing 18 of the inventoried plant species. At the end of the study period, we detected 29 and 39 species in lawns and transformed meadows, respectively, 17 species being common to both greenspace settings. The vegetation richness and diversity significantly increased over time in the transformed meadows, unlike in control lawns. Additionally, differences in vegetation communities between the two types of greenspace settings increased over time. At the end of the study period, transformed meadows provided resources for 35 species of bees, more than a half of them being wild solitary bee species.

Neither carbon dioxide emissions nor the fluxes of methane and nitrous oxide significantly differed between the two greenspace types, and none of the studied soil physicochemical properties differed between control lawn and transformed meadow soils. Similarly, neither phospholipid fatty acid-based soil microbial communities nor soil bacterial and fungal biomasses of soils from both types of greenspace settings did significantly differ with each other, suggesting that any possible change in soil aspects takes a longer time to respond to the exerted changes in greenspace management and plant communities.

Lastly, we analysed the dimensionality of the respondents' experiences of nature via structural equation modelling, and we determined that the best model contained all the abovementioned dimensions except the consumptive/appreciative dimension. Our results also show that there were significant correlations between the respondents' experiences of nature and both their environmental identity and environmental concern. Nevertheless, correlations suggest experiences of nature to be a distinct construct from that of environmental identity and environmental concern. A larger number of respondents belonging to a more diverse range of stakeholders is necessary to verify whether such conclusions apply to a broader audience beyond that involved in this case study.

This case study on a citizen-based pro-environmental transformative activity is a research example that incorporates social and environmental sciences to explore participants' nature experiences and attitudes, along with the short-term environmental effects that their transformative activity has on biodiversity, greenhouse gas dynamics and soil

physicochemical properties. The study helps us to better understand the impacts that pro-environmental initiatives can have in the context of human-nature interactions, as well as the type of stakeholders who might engage in these types of pro-environmental activities.

Keywords

environmental concern, environmental identity, experiences of nature, greenhouse gases, lawn, urban biodiversity, urban meadow

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The authors have declared that no competing interests exist.

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