Time for a biodiversity turn in sustainability science

For a society to emerge in which people make money through restoration rather than through the destruction of nature, closer dialogue between sustainability science and socially diverse biodiversity conservation is needed.

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Accelerating biodiversity loss is one of the major threats to a sustainable future of our planet. Sustainable Development Goals (SDGs)1 14 and 15 that address the degradation of oceanic and terrestrial ecosystems have experienced a long-term negative trend, and thus the biodiversity crisis, along with climate change, is one of the major unresolved issues of sustainable development (UN 2019). Indeed, none of the 2020 Aichi Biodiversity Targets of the Convention on Biological Diversity (CBD) has been met2, and animal populations have declined by two thirds within only a few decades3. The vast majority of protected areas across Europe are in poor condition (EEA 2020), and according to Swiss Re “a fifth of countries worldwide [are] at risk from ecosystem collapse as biodiversity declines”4.

However, while biodiversity loss is widely acknowledged as an impediment to sustainable development, so far there have been relatively few solution-oriented collaborations between experts from nature conservation and sustainability science. For instance, developing new relationships with nature (in the sense of “ecological webs”) is neither recognised as an entry point nor as a lever of societal transformation (UN 2019). With the evolving focus of sustainability science from problem diagnosis to societal transformation we must foster ecological innovations as much as technoscientific and social5 ones. All land, and especially intensively used areas, must regain ecological qualities through biodiversity-friendly land use practices and ecological restoration6. We need ecological innovations in urban as much as in rural areas, and in affluent countries as much as in developing ones, and we need to involve a much broader segment of society in responsible and competent ecological practices.

In this article we argue that a dialogue between sustainability science and nature conservation would benefit both sides. Nature conservation could learn from sustainability science how to complement its focus on protection with socially engaging transition strategies toward biodiverse land-use systems and societies. Sustainability science, in turn, would benefit from a better integration of ecological knowledge to judge synergies and trade-offs between the promotion of biodiversity, climate adaptation and development, and more generally to envision nature-based societies in the Anthropocene. We present ongoing projects in Switzerland in the context of the Swiss Biodiversity Strategy and its action plan to highlight the potential of such collaborations. In a first paragraph, we demonstrate how experiences and methodologies from sustainability science can help to enable transformation processes towards biodiverse urban areas. In the second part, we argue that the growing importance of relational values in biodiversity conservation can be harnessed to broaden the coalition of actors for biodiversity conservation.

Scaling-up urban transformation for biodiversity

City planning is confronted with two opposing trends: densification and greening. To prevent urban sprawl, construction is now largely confined to existing urban

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1 www.un.org/sustainabledevelopment/sustainable-development-goals
2 www.cbd.int/gbo5
3 livingplanet.panda.org
4 www.swissre.com/media/news-releases/nr-20200923-biodiversity-and-ecosystems-services.html
5 Including a reform of the economic system and changing cultural practices and values.
6 The UN Decade on Ecosystem Restoration will start in 2021: www.decadeforestoration.org
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To this end, a process-based methodology ensured the active involvement of relevant actors and their needs so that win-win solutions could be worked out together. We focused on four concrete cases. The cases represented different life cycle phases (planning, construction, maintenance) and types of ownership (public spaces, housing estates, office buildings). Together with the relevant decision-makers we defined the specific objectives for their sites and organisations by analysing the initial situation and the needs of the various stakeholders. We then developed a concept for promoting biodiversity and quality of life in outdoor spaces as a starting point of a longer-term process: our partners should eventually be enabled to advance the biodiversity-promotion measures on their own. The aim of such a co-creation process is to anchor biodiversity and its services permanently in the decision-making processes of the various organisations. The results gained from the four case studies will be used to upscale similar processes in the different linguistic and cultural areas of Switzerland through creation of regional networks that enable innovation across the country. The results will also show how biodiversity can contribute to the sustainable development of cities and municipalities (SDG 11). To this end, we can count on the support of four federal offices: Swiss Federal Office for the Environment (FOEN), Federal Office for Spatial Development (ARE), Federal Office for Housing (BWO), and Federal Office of Public Health (FOPH).

Recognizing diverse relations with nature across society

In recent years, relational values of nature have increasingly gained recognition in biodiversity conservation as a complement to intrinsic and instrumental values (Chan et al. 2016). Relational values are not inherent in living beings or ecological entities, but rather derive from our relationships with them. They relate to virtues such as stewardship, responsibility and care and resonate with a recognition that socioecological contexts matter for social agency in processes of societal transformation (Kueffer et al. 2019, UN 2019). Relational values help us to better link nature conservation to our everyday life by highlighting our personal, social, cultural, and spiritual relationships with nature.

At a pragmatic level, this allows to foster biodiversity-friendly practices in different socioeconomic sectors (“mainstreaming biodiversity”) – for instance, the promotion of biodiversity in urban planning and building legislation as described above (Kueffer et al. 2020). At a more fundamental level, relational values help us to engage a broader segment of society with biodiversity. The German Bundesaamt für Naturschutz (BfN), for instance, has focused increasingly on the intersections of nature conservation with other societal issues, such as poverty or migration, to develop strategies that reach out to culturally diverse groups, thereby reducing socioeconomic biases in the awareness of biodiversity, and bringing the issue of environmental justice to the fore in nature conservation. In a forthcoming study, supported by the Swiss Federal Office for the Environment (FOEN), we have worked towards strategies that support a more inclusive, socially diverse, and multicultural biodiversity conservation movement (Kueffer et al., unpublished data). Based on a survey of neglected social actors in Swiss nature conservation, we organised workshops that explored ways to establish

7 Katrin Hauser and Manuela Di Giulio, together with Daniele Martinoli, Swiss Biodiversity Forum.
8 Organised in April 2018 in Bern by the Swiss Biodiversity Forum, KPM Center for Public Management at the University of Bern and Natur Umwelt Wissen GmbH.
9 www.siedlungsnatur.ch
10 www.bfn.de/themen/gesellschaft/soziale-fragen.html
11 Christoph Kueffer and Caroline Wiedmer, together with Ariane Tanner at Franklin University Switzerland in Lugano and Jasmin Joshi at ILF, OST Ostschweizer Fachhochschule in Rapperswil, among others.

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new alliances for biodiversity. We used narrative methodologies to facilitate experience-based workshop interactions and created digital stories in the form of videos to illustrate how knowledge about ecological innovations can be made more accessible. One workshop focused on strengthening interactions between the “traditional” green industry and the nature garden movement. It showed that many traditional gardeners care greatly about biodiversity. Rather than a divide we found commonalities in the form of shared challenges, for instance, the need to defend the value of the artisanry of good gardening. A second workshop with entrepreneurs explored why so few start-up companies focus on biodiversity-related products and services. One challenge here is that biodiversity is often perceived to be a free good, and consequently there is no market; another one is that conservationists sometimes oppose entrepreneurship. A third workshop focused on why the well-documented health benefits of nature are only poorly harnessed in the health sector. Medicine in our society, so our finding, is primarily oriented towards fixing illness rather than preventing it by strengthening self-healing abilities. Finally, we spent a day involving about sustainable and biodiverse futures. The Swiss Academic Society for Environmental Research and Ecology (saguf) has – for almost 50 years now – been carrying out a doi:10.14512/gaia.26.2.23, doi:10.14512/gaia.27.4.5, doi:10.14512/gaia.27.4.6, doi:10.14512/gaia.27.2.6

This complementary is needed to make the 21th century an era of ecology: sustainability must be rooted in ecology, and ecology rooted in society.

The stories of our workshop participants illustrated how even in a country like Switzerland – where the majority of the population lives in cities and works in offices – living with nature matters greatly.12 The workshops also highlighted that issues of nature conservation are intrinsic to the broader questions underlying the transition to a post-growth, nature-based and care-oriented economy. In a sustainable society people must be able to make money in ways that restore rather than destroy nature as a by-product13.

Conclusions
Building bridges between sustainability science and biodiversity will be central to reach a sustainable society. We presented projects that explored the role of biodiversity in professional fields that are traditionally considered to be unrelated to nature conservation: architecture and urban planning, commercial horticulture, entrepreneurship and medicine. Our examples illustrate how we can unleash creativity and form new partnerships – for instance, between a young rural and urban population – for ecological innovations by engaging a broader segment of society in design thinking about sustainable and biodiverse futures. The Swiss Academic Society for Environmental Research and Ecology (saguf) has

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12 The UN increasingly recognizes concepts such as Harmony with Nature, Mother Earth, or Rights of Nature that represent a non-anthropocentric understanding of our relationship with nature: www.harmonywithnatureun.org.
13 While at present even government subsidies mostly promote practices that lead to further destruction of biodiversity: www.wsl.ch/de/2020/08/ueber-160-subventionen-schaden-der-biodiversitaet-in-der-schweiz.html.

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