Green roofs and ponds as networks

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To enhance biodiversity across aquatic and terrestrial systems, natural areas of high ecological value need to be interconnected. However, the necessary collaboration between different stakeholders is often lacking, particularly in urban areas. This is shown by a new study as part of the 'Blue-Green Biodiversity' Research Initiative.

Animals, plants and other creatures are finding fewer and fewer intact habitats - including in Switzerland. Although there are protected areas spread across the country, 'in the long term, however, they are unlikely to be enough to preserve biodiversity,' says Giulia Donati, a postdoctoral researcher at the aquatic research institute Eawag. It is therefore becoming increasingly important to preserve or enhance other areas outside protected areas - and to connect them with each other in such a way that exchange between the individual populations is ensured.

In a study recently published in the journal 'Conservation Letters', a research team led by Donati investigated how the protection of such ecological networks is linked to collaboration between different stakeholders such as authorities, nature conservation organisations and land users. 'A network of habitats is always connected to a network of people,' says Donati. The habitat quality of a forest edge, for example, depends on various stakeholders: How does the forestry office manage the forest? What does the farmer sow on the neighbouring agricultural land? And how do walkers use the forest?

For their study, the researchers focussed on habitats at the interface between water and land, known as 'blue-green systems'. These include aquatic ecosystems such as rivers, lakes or ponds (blue) and terrestrial ecosystems such as forests, meadows, parks or gardens (green). The project was part of the Blue-green Biodiversity Research Initiative of Eawag and the Swiss Federal Institute for Forest, Snow and Landscape Research WSL.

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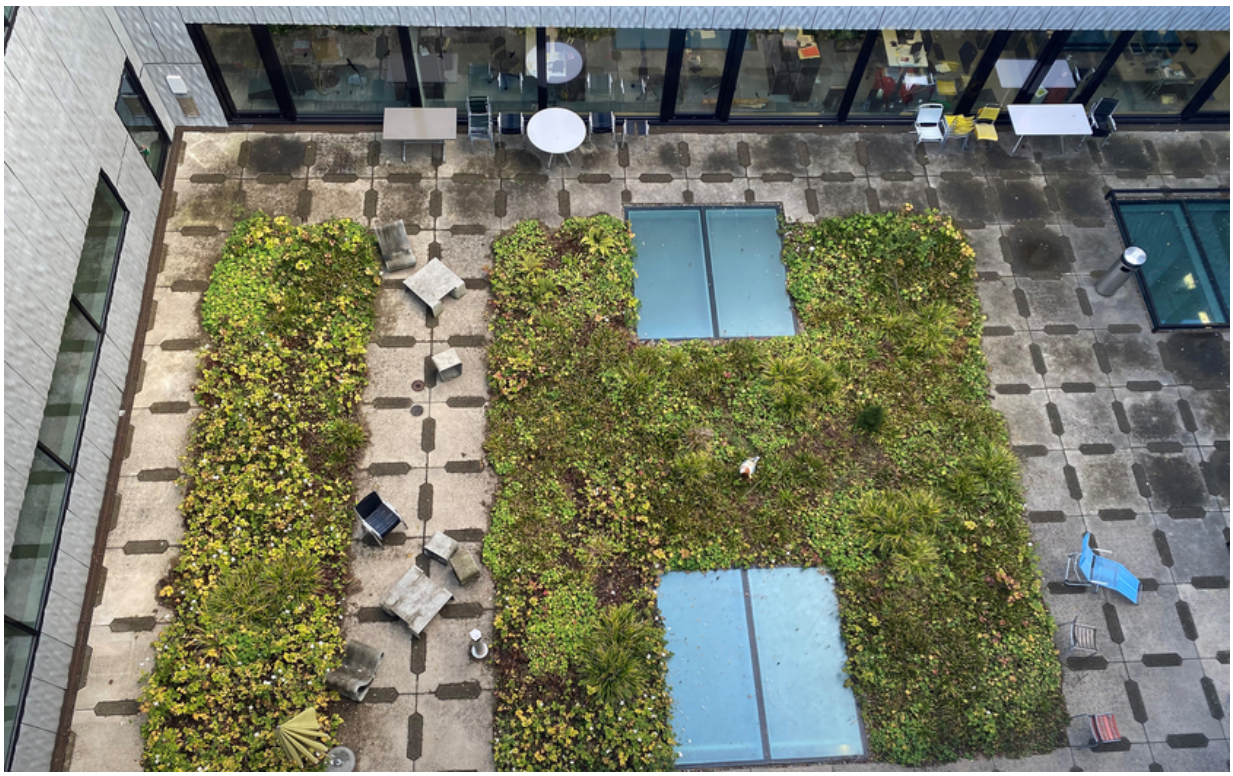

Even in heavily built-up areas, measures for the benefit of people and nature are possible (Photo: Francine van den Brandeler, Eawag).

Who is working with whom?

Donati and her team analysed such habitats in three areas in the cantons of Aargau and Zurich - in the regions of Aarau, Baden-Brugg and Greifensee. They chose amphibians, i.e. frogs, toads and newts, as an example of a group of organisms that depend on ‘blue-green’ areas. They modelled and analysed where and in which landscape elements amphibians can live and how well these areas are connected to each other.

They supplemented these ecological network models with a survey of around 180 organisations that are active in the three regions - for example in urban planning, environmental protection, forestry or agriculture, but also hunting associations, allotment garden clubs and gravel pit operators. They were all asked whether and where they were involved in the management of blue-green infrastructureand which other organisations they worked with in this context.

There was a clear difference between the collaborative management of interconnected blue-green areas in rural and urban areas: in the case of rural, more natural areas, there is relatively good coordination between nature conservation organisations, authorities and land users. In urban areas, on the other hand, there is often a lack of clear responsibility and co-operation in the context of interconnected blue-green areas. A possible explanation for this discrepancy is the fact that there are many more years of experience with nature conservation projects across aquatic and terrestrial elements outside of urban areas. Authorities, nature conservation organisations, agriculture and forestry are used to working together to improve a pond on the edge of a forest or a stream and adjacent meadowland, for example.

To network and successfully manage blue and green infrastructure such as the ponds, green spaces and trees in Opfikon (canton of Zurich), it is important that city councils, nature conservation organisations, building authorities, transport authorities and society work closely together (Photo: Francine van den Brandeler).

Gardens as stepping stone areas

Nature conservation in urban areas, on the other hand, is still a relatively emerging field, says Donati. The ecological function of urban natural elements is often given too little consideration. In cities, many watercourses run underground or are canalised. City parks and private gardens are often only seen as recreational areas and are not specifically integrated into nature conservation strategies. Yet they could become important stepping stones for a variety of species such as amphibians if they were designed in a strategic way.

In addition, there is a particularly large number of different interest groups in the settlement area.. In cities, different stakeholders are responsible for individual environmental aspects: the building authority for green spaces, the water authority for bodies of water, private individuals for their gardens or companies for their green roofs. ‘This can lead to a kind of silo mentality fragmenting aquatic and terrestrial systems and makes effective environmental governance more challenging,’ says Donati. In the worst-case scenario, measures to protect natural areas remain uncoordinated and valuable areas are lost.

Spaces for exchange

The researchers are therefore calling for more coordinated approaches to nature conservation in urban areas. Donati does not have a magic formula, she admits. But it is important to overcome existing barriers between different stakeholders. ‘We need space for exchange to enhance effective collaboration between city administrations, nature conservation

organisations, building and transport authorities, and civil society.' This was also evident in workshops to which the researchers invited the organisations surveyed. There, the idea of improved coordination met with great support.

However, it also emerged that there are hurdles in terms of funding, training and expertise. According to Donati, this is precisely why it is important to make nature conservation knowledge accessible to all stakeholder groups. She refers to the Translational Centre Biodiversity Conservation, a project funded by the ETH Board for three years. In a collaborative effort scientists and practitioners team up topool findings and publish them as fact sheets or recommendations in order to advance biodiversity conservation projects.

According to the researcher, the results of the study do not mean that collaboration guarantees the success of biodiversity measures. It is not always possible to reconcile the various interests. 'However, understanding different needs, challenges and perspectives is crucial to identifying common ground and co-creating more sustainable futures for both people and nature. Collaboration is an important prerequisite for projects to be able to succeed in the first place,' says Donati. Because without open dialogue and collaboration, effective biodiversity protection remains out of reach.

Blue-Green Biodiversity Research Initiative

The research project «BlueGreenNet: Social-ecological networks to enhance biodiversity in peri-urban regions» contributes to the Blue-Green Biodiversity Research Initiative – an Eawag-WSL collaboration that focuses on biodiversity at the interface of aquatic and terrestrial ecosystems. The initiative is funded by the ETH Board.

Cover picture: Blue-green areas are important for improving the urban climate - but also for connecting animal and plant habitats (Photo: Giulia Donat, Eawag).

Original publication

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