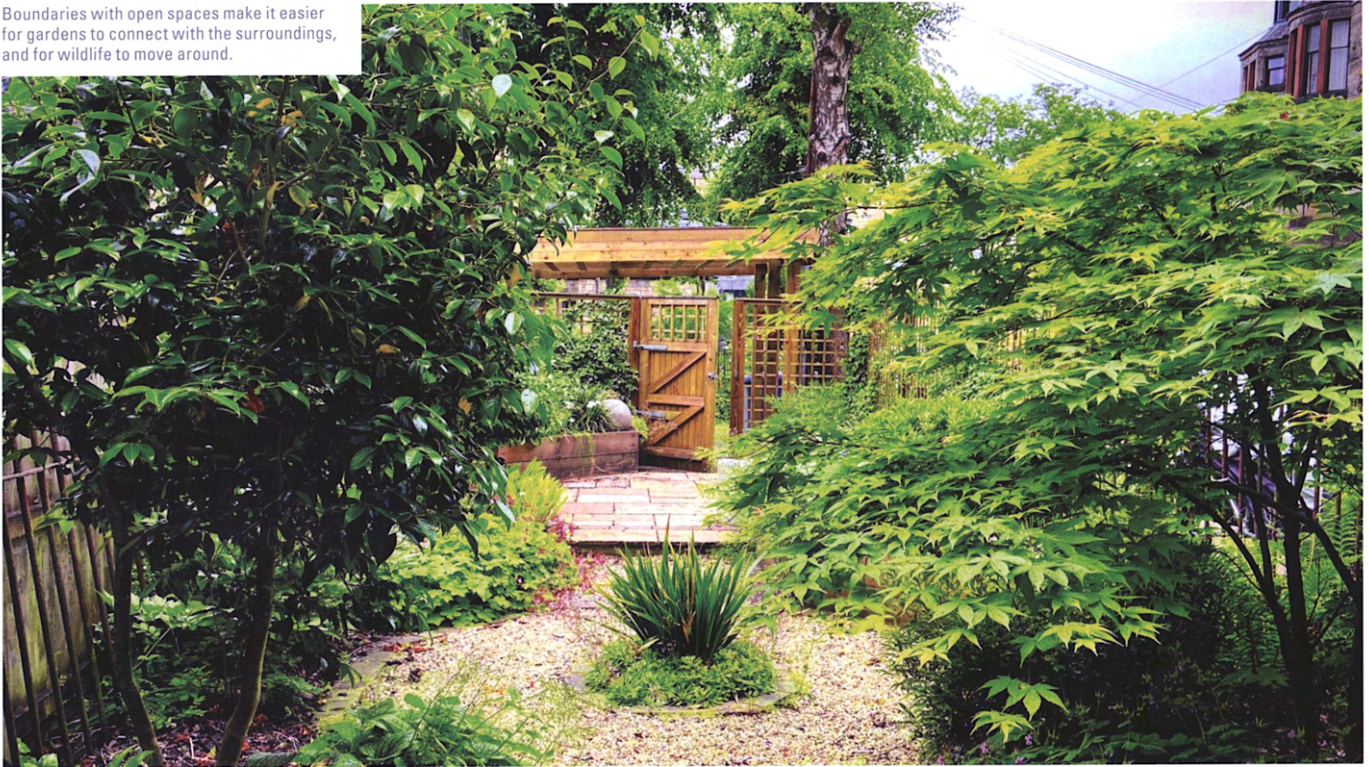


Boundaries with open spaces make it easier for gardens to connect with the surroundings, and for wildlife to move around.



CONNECTING OUR GARDENS TO HELP BIODIVERSITY



Photographs and illustration: Rachel Bailey MSGD

Destructive changes to the environment mean the world is losing large swathes of vital insect and animal habitats. **Rachel Bailey MSGD** discusses how we can all take steps to make a difference

According to the United Nations (UN), we are 'losing around 135 plant, animal and insect species every day'. Modern agricultural methods and increasing urbanisation have caused the degradation, removal and fragmentation of habitats, and these changes are key drivers of biodiversity loss.

A study of islands by carried out by Professor of Biology at Princeton University, the late Robert H. MacArthur, and Edward O. Wilson, currently University Research Professor and Honorary Curator in Entomology at Harvard University, and published in 1967 in their book, *The Theory of Island Biogeography*, has shown that the level of biodiversity on these landmasses is lower

if the islands are small and further away from other islands.

Gardens and other urban green spaces are like these islands. In Britain, private urban gardens (520,000 hectares) and public parks (44,000 hectares) together cover double the area of managed nature reserves (275,000 hectares).

Why size and connection matter

Small, isolated areas of habitat support smaller wildlife populations. This is because the areas lack the greater resources and range of habitats found in larger areas and which are needed to complete life cycles. Population sizes of wild animals and plants naturally vary over time but small →



populations particularly are more likely to go locally extinct because of in-breeding, for instance, or due to chance events. Smaller areas of habitat also have less 'core' (where conditions are more stable and moderated) area, and more 'edge' (where conditions are more variable) area. As a consequence, smaller areas are more likely to suffer from natural and human disturbances, making it impossible for some species to survive.

Increasing the amount of green space in urban areas is important but the cookie-cutter nature of heavily built-up areas means that the spaces are more likely to be small in size. We, as designers, can make a huge difference though, greatly increasing the biodiversity of these small areas by ensuring they connect with each other through well-considered landscape design. Linking together small areas that have high levels of biodiversity will enable them to function more like big areas; wildlife will be able to move through the landscape, which will lead to larger and more resilient populations with longer lifespans.

FIVE STEPS TO CONNECT NATURE

- Make sure every garden is designed in the context of the wider landscape and connect it to the wider ecological network. Find out what species and habitats exist in neighbouring gardens and parks and further afield, including nearby rural areas;
- Consider what kind of habitats might be suitable for the garden you are designing; that will depend on its soil type and conditions, its aspect etc.; build the resilience of wildlife populations across the landscape by adding to existing habitats that are commonly found in and near the garden;
- Make sure wildlife can connect with the garden itself by unsealing the soil and restoring it to good health if necessary; include a water element, and incorporate a complex vegetative structure;
- Measure changes in biodiversity, using baseline data to monitor the impact of the changes you have made.



TOP: identifying habitats in the wider landscape allows our gardens to become part of the local ecological network. ABOVE: forage plants for pollinators' larvae is just as important for connectivity as nectar-rich flowers.

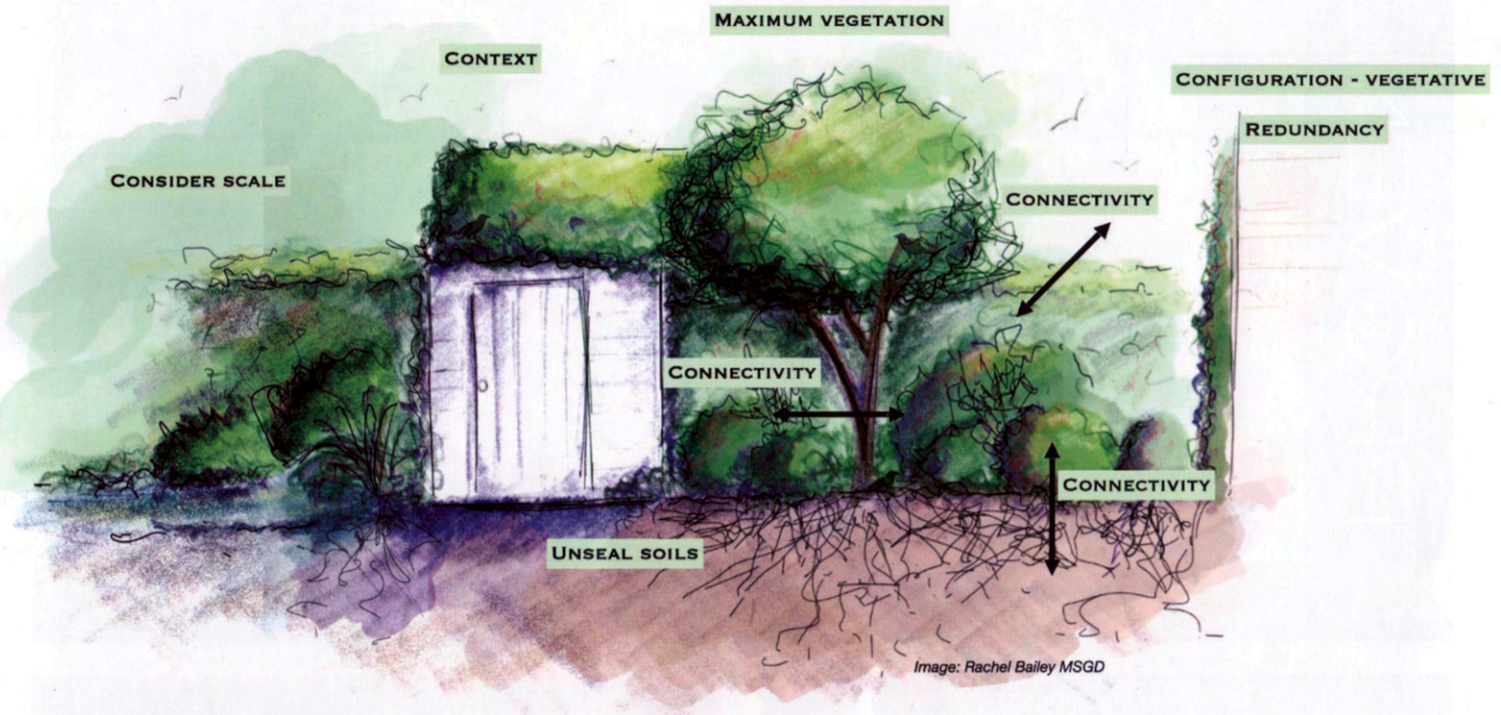


Image: Rachel Bailey MSGD

Practical solutions

For very small animals, and for micro-organisms, connectivity as well as the quality of the habitats within the garden is important. We can ensure a high level of connectivity by keeping the garden soil healthy and by using layered planting to create a complex vegetative structure. This type of structure typically requires trees and shrubs with canopies that stand above six feet. Plants that have nectar, fruit and foliage (food for wildlife throughout their lifecycle), rough grass, leaf litter, water and a bark mulch on planted borders. Together, these elements provide wildlife

WHILE WE NEED TO INCREASE BIODIVERSITY IN THE GARDEN, CREATING LOTS OF DIFFERENT HABITATS IN ONE SMALL SPACE COULD RESULT IN THEM BEING WORTHLESS.

with opportunities for year-round food and a range of shelters that are close together within the garden.

Ideally, the complex vegetative structure will cover as much of the garden as possible, which will mean limiting the amount of hard landscaping, a conversation that we designers need to have with our clients; encouraging them to remove existing paving is a simple way to effectively reconnect the soil with air, water, and plants.

Less can be more

While we need to increase biodiversity in the garden, creating lots of different habitats in one small space could result in them being worthless. The same goes for including lots of different plants. Research shows that big drifts of single species are ideal, and diversity can be added with planting that is layered within the space, from trees to ground cover, and seasonal, so there is both redundancy and a succession in forage plants.

The wider landscape will also add a →



TOP: consider connectivity at all stages of the design process and at different scales - see how this garden design connects with the wider landscape. ABOVE: layered planting in a garden offers quality habitats, particularly for smaller organisms.



ABOVE: planting nestled among the rocks and gravel of this coastal garden increases the area of natural habitats to be found just yards away, along the shore.

IDENTIFY EXISTING HABITATS TO FORM CONNECTIONS.

layer of diversity with different plant species found in neighbouring gardens, nearby parks, and so on. The biodiversity value of a single garden is also enormously affected by a garden's relationship with the surrounding landscape. For larger species of wildlife, such as birds and mammals, a single garden will not be enough to support a viable, resilient, population. However, each garden can form part of a larger habitat if it is connected to other areas around it, either directly or in a 'stepping-stone' fashion.

Do your research

Identifying existing habitats is key to building connectivity in a garden. We should be doing desk-based surveys, using

maps and satellite images, and scouting out the locale to learn what lives within the wider landscape, and at scale. For example, what is within 30 feet, 350 feet and half a mile of the garden? Creating similar habitats within the garden can connect it with, and improve the biodiversity value of, the wider landscape. Including grassy areas or ponds can expand similar habitats nearby, all making wildlife populations larger and more resilient.

Planting trees and shrubs close to those in neighbouring gardens can provide a larger area of cover for nesting, shelter, and protection. Hedges and shrubs can connect to street tree canopies, forming corridors.

Individual designers and organisations such as the Society of Garden Designers should champion these landscape ideas in garden design and consider connectivity throughout the design process. ○

