

STRIDE TREGLOWN

**A BITE-SIZE, PLAIN-ENGLISH
WHY, WHAT, HOW
FOR PROJECT COMMISSIONERS
AND DESIGNERS**



MAXIMISING **BIO**DIVERSITY THROUGH DESIGN



This document forms part of our series of guides covering climate, biodiversity, resources, and wellbeing.

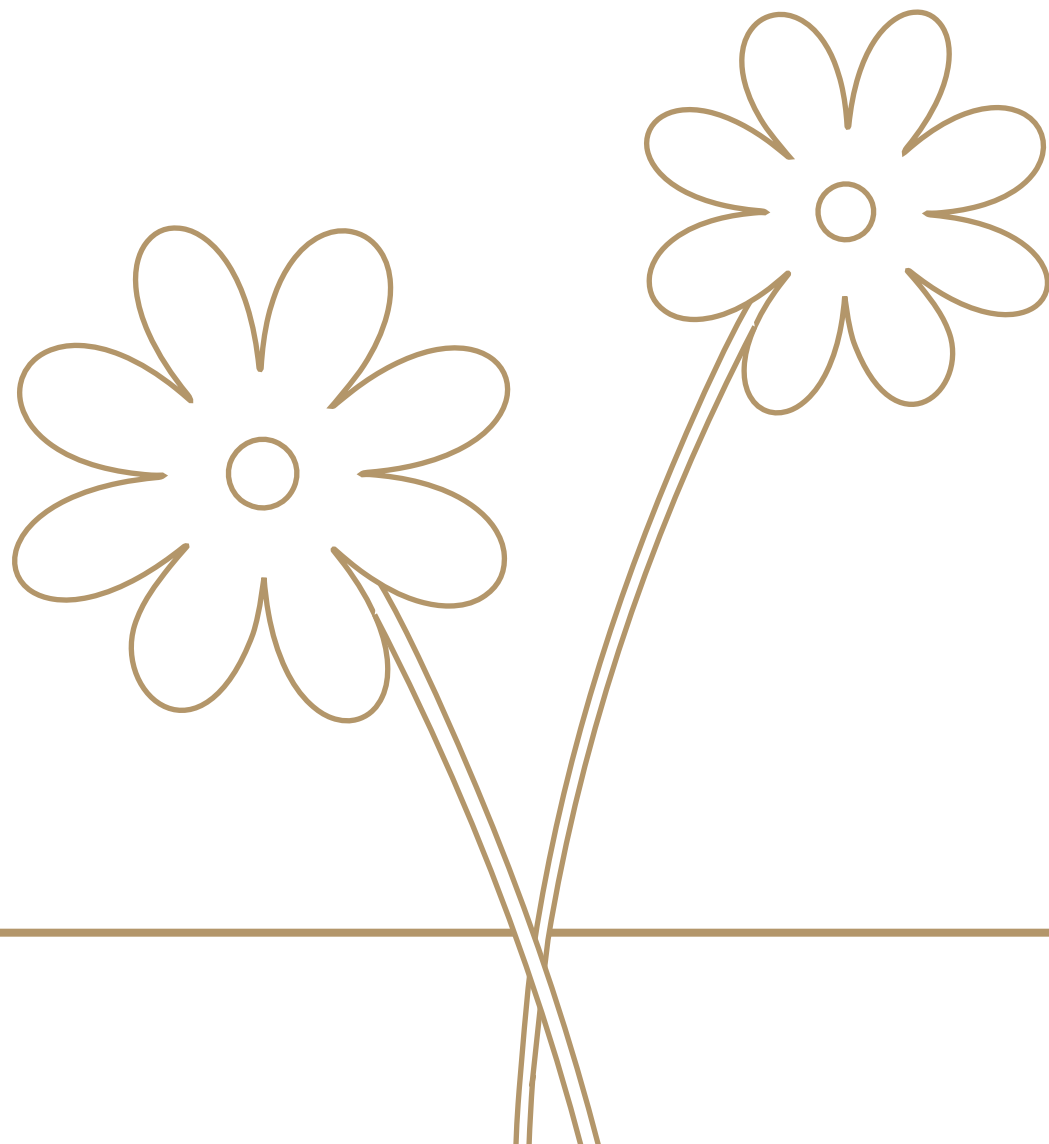
In the spirit of the Landscape Architects Declare and Architects Declare, this open source guide is designed to help anyone in the building industry maximise biodiversity in their own projects.

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Foreword



“The challenges in front of us can feel daunting. In order to meaningfully respond to climate change, biodiversity loss, and related public health impacts, we need built and natural environmental professionals working together to create and innovate solutions.

Our priority should be long-term high-quality placemaking and place-keeping that puts positive outcomes for people and nature at the heart of the design process. Given the pressure to find suitable land for development, the problems we face as designers can feel complicated, and yet that the solutions don't need to be!

This timely guide is committed to this same mantra of “keeping it simple”, and that's why I think it's well placed to support those engaged in the planning and development process. It offers a concise but robust overview of design ideas and concepts to embed biodiversity into the design process from the start. This is the most effective way to secure locally relevant benefits for wildlife and create a nature-rich environment, both within and beyond the development boundary.

Dr Gemma Jerome, FLI

Director and Co-Founder of Building with Nature

Keeping it simple

There is a huge amount of information out there about how to increase biodiversity in building and landscape projects, especially with the Biodiversity Net Gain regulations having come into force.

This step-by-step guide untangles what this means for projects, so you can maximise biodiversity through design at all stages and scales of development.

Biodiversity: (*biological diversity*) is the variety and variability of life on earth; from micro-organisms in soils and rivers; to insects, fish, birds, reptiles and mammals; to fungi, grasses, flowers, shrubs and trees.



WHY maximise biodiversity?

- 1 To help reverse the monumental scale of species decline and habitat destruction.

'The UK is now one of the most nature-depleted countries on Earth' – [State of Nature Report 2023](#)

Yet we are dependent on nature for everything, from clean air and water, to food, building materials, medicine, and energy production.

Protecting and increasing biodiversity is crucial for the future viability of all life on earth. This is both because we are dependent on it but also because of its key role in tackling our other great challenge; climate change.

- 2 To improve our health and happiness.

A 'happy', healthy, and well-functioning bio-diverse environment is inextricably linked to giving people the best chance of being happy, healthy, and well-functioning.

'Being outdoors in green or blue spaces is predictive of a significant boost in happiness' – [World Happiness Report 2020](#)

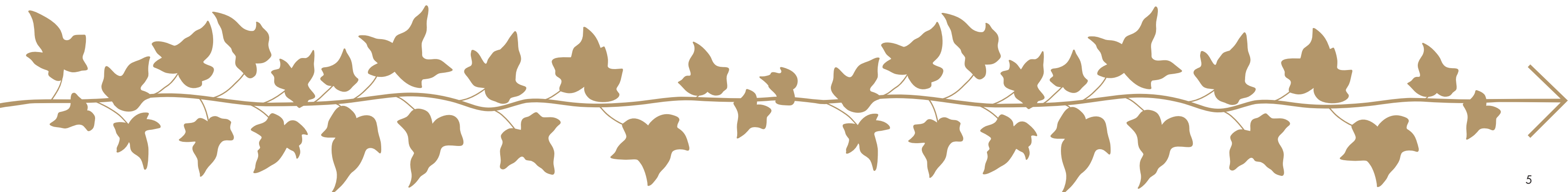
'Biophilic design can reduce stress, enhance creativity and clarity of thought, improve our well-being, and expedite healing' – [14 Patterns of Biophilic Design, Improving Health & Well-Being in the Built Environment](#)

- 3 To meet increasingly stringent legislation and reputational pressures.

Existing UK **legislation** such as Biodiversity Net Gain, Biodiversity Duties for public bodies, London's Urban Greening Factor and Nutrient Neutrality (to name a few), combined with the pressure of meeting **sustainability expectations**, requires projects to deliver increasingly higher biodiversity targets.

In September 2023, the [Taskforce on Nature-related Financial Disclosures](#) published its framework 'for organisations to report and act on evolving nature-related dependencies, impacts, risks and opportunities'.

The **UK government** 'should consider making these latest rules mandatory for companies. We are in a nature emergency and the rules need teeth.' – Rt Hon Philip Dunne MP, Environmental Audit Committee Chairperson.



WHAT can we do to maximise biodiversity?

Consider timing, locations and scales of biodiversity in all projects.

TIMING: Biodiversity throughout the whole project lifecycle and into the long term by designing not only for now but also to monitor and manage for decades afterwards.

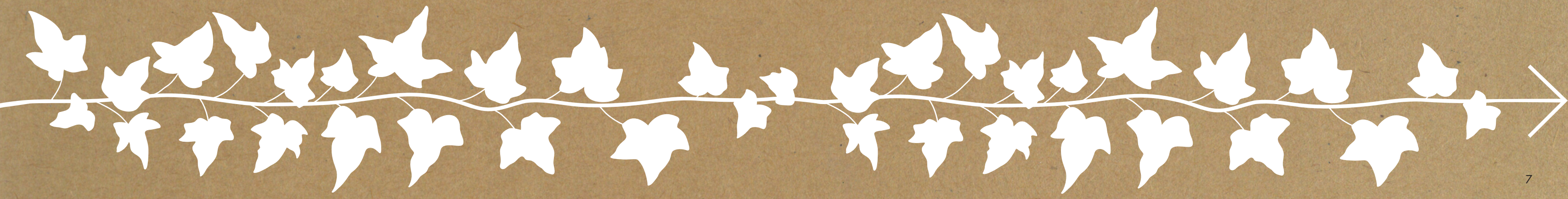
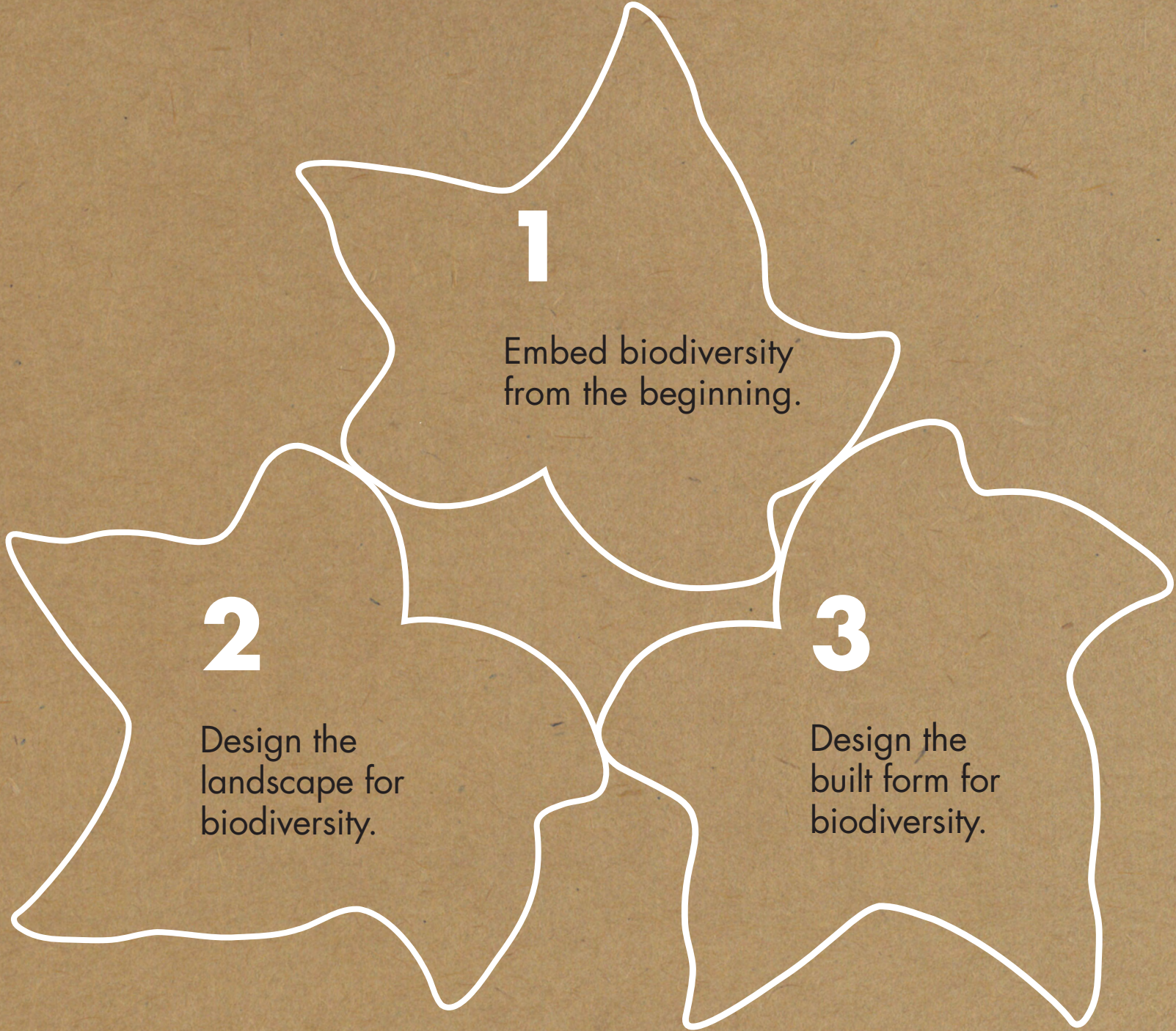
LOCATIONS: Biodiversity intrinsic to the built form and in the landscape within the site. The relationship between the two, and with what's outside the site.

SCALES: Biodiversity from small to large interventions and everything in between.



HOW can we do it?

By focusing on
three key areas...



HOW to embed biodiversity from the beginning

For more information:

[Natural England Habitat Management and Monitoring Plan Template](#)

[Building with Nature](#)

1 Create an exciting and inspiring vision for a holistic nature-led design that forms part of the identity of the project. This could be aligned with a *Building with Nature* approach and accreditation, adding further value.

2 Involve Landscape Architects, Ecologists and Planners early at the scoping and early client engagement stages. This helps ensure a biodiversity-led approach and vision is embedded from the outset.

3 Include targets in the brief that ensure the implementation and long-term management of a biodiversity-rich project. For example, setting Biodiversity Net Gain (BNG) targets which far exceed the statutory minimum of 10%, or coordinating a long-term habitat management plan which ties in seamlessly with Local Nature Recovery Strategies.

5 Identify and incorporate local and regional strategic priorities for biodiversity into the project scope and vision.

4 Ensure the client and design team understand and provide for long-term assessment, and evaluation of, biodiversity outcomes. For example, the Habitat Management and Monitoring Plan (HMMP) outlines how the land will be managed for at least 30 years to create, enhance, and monitor habitats for BNG.

6 Discuss the mitigation hierarchy early (avoid, mitigate, offset/compensate).

7 Understand the baseline biodiversity within and surrounding the site early by commissioning surveys and carrying out desktop research early on: ecology, habitats, soil health, and green & blue infrastructure.

8 Engage stakeholders early with the long-term biodiversity vision and strategy. This could include local residents, community groups, wildlife groups, and land & building managers, users and maintainers.

9 Ensure the contractor is aligned with the biodiversity strategy and vision (if there is early contractor involvement).

HOW to design the landscape for biodiversity

1 Identify the biodiversity constraints and opportunities early.

2 Take a landscape and nature-led approach to the site's design.

3 Consider tree, plant and grass mixes that maximise biodiversity and climate change resilience.
For example, maximising the range of species used and using species that can tolerate drought and flood conditions.

4 Create strategies to enhance existing biodiversity and to create new habitats in the landscape.

5 Prioritise retaining and reusing site-sourced soil with minimal disturbance to all soils on site.

6 Incorporate water bodies and Sustainable Drainage Systems (SuDS) into the landscape design.

7 Take a multidisciplinary approach by involving Ecologists, Planners, Masterplanners, Engineers, and Landscape Architects who can continue to evolve biodiversity in the project's strategy, vision, and design.

Wildlife in the landscape

[Landscape and Urban Design for Bats and Biodiversity](#)

[Homes for People and Wildlife](#)

8 Design-in opportunities for food production and composting.

9 Coordinate with Landscape Architects and Ecologists to retain existing habitats, making them central to the design strategy.

HOW to design the landscape for biodiversity

10 Look for opportunities to enhance biodiversity in the landscape's infrastructure.

For example, green roofs for refuse and cycle stores, or using living willow as a biodiverse alternative to stone, concrete, or sandbags for revetments.

11 Consider the wide range of animal species that can cope with the urban environment, in addition to species that are legislated for.

12 Include ecological health in the procurement strategy to help avoid toxic supply chain practices i.e. environmental damage to air, land, water, or soil.

13 Integrate detailed design strategies for long-term sustainable and diverse land uses (for phased developments integrate sustainable temporary/'meanwhile' uses). For example, food production, nature gardens, natural play areas, forest schools, and SuDS?

14 Incorporate biodiversity into play areas.

15 Make biodiversity design elements integral to the design so that they are less vulnerable to cost reviews or value engineering.

16 Design well thought through connections and enhancements between green and blue infrastructure elements within the site and with those outside the site. Include these in the design rationale.

17 With an Ecologist, make a full range of wildlife homes, habitats and movement routes an intrinsic part of the landscape strategy. This could include permeable boundaries for hedgehogs and other creatures to move freely, and routes for a range of species e.g. insects, birds, bats, hedgehogs and reptiles.

Wildlife in the landscape

[Biodiversity Net Gain Checklists](#)

[Process for designing and implementing Biodiversity Net Gain](#)

HOW to design the built form for biodiversity

1

Consider the position of the built form in relation to the existing biodiversity and the emerging biodiversity strategy, coordinating with a Landscape Architect and an Ecologist.

2

Design-in other wildlife friendly features like balcony planting.

3

In coordination with an Ecologist, consider a full range of wildlife habitats as an intrinsic part of the built form, including bio-diverse green roofs, green facades, bee bricks, swift bricks, and other bird and bat nesting boxes.

4

As default, design all roofs as habitat roofs, e.g. brown or green roofs that are also solar roofs.

5

Include non-human building users' needs and safety as part of the overall building design process. For example, bird-friendly building design considerations like using patterned or fritted glass to reduce bird mortality rates.

6

Incorporate green, wildlife-friendly facades in as many locations as possible in coordination with a Landscape Architect, Ecologist or specialist supplier.

Bird and bat friendly buildings

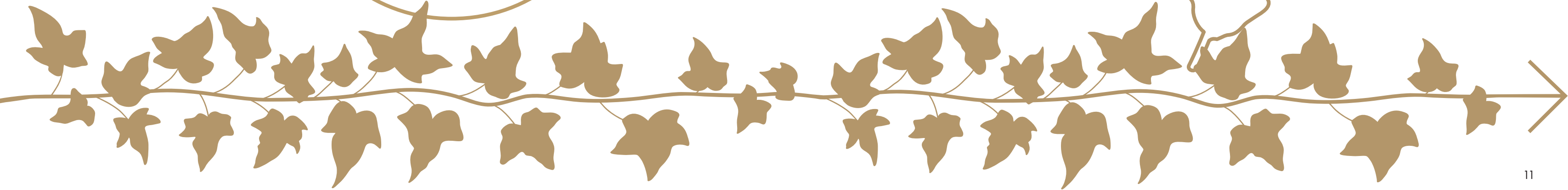
[Campaign for Swifts](#)

[Bird Friendly Building Guide](#)

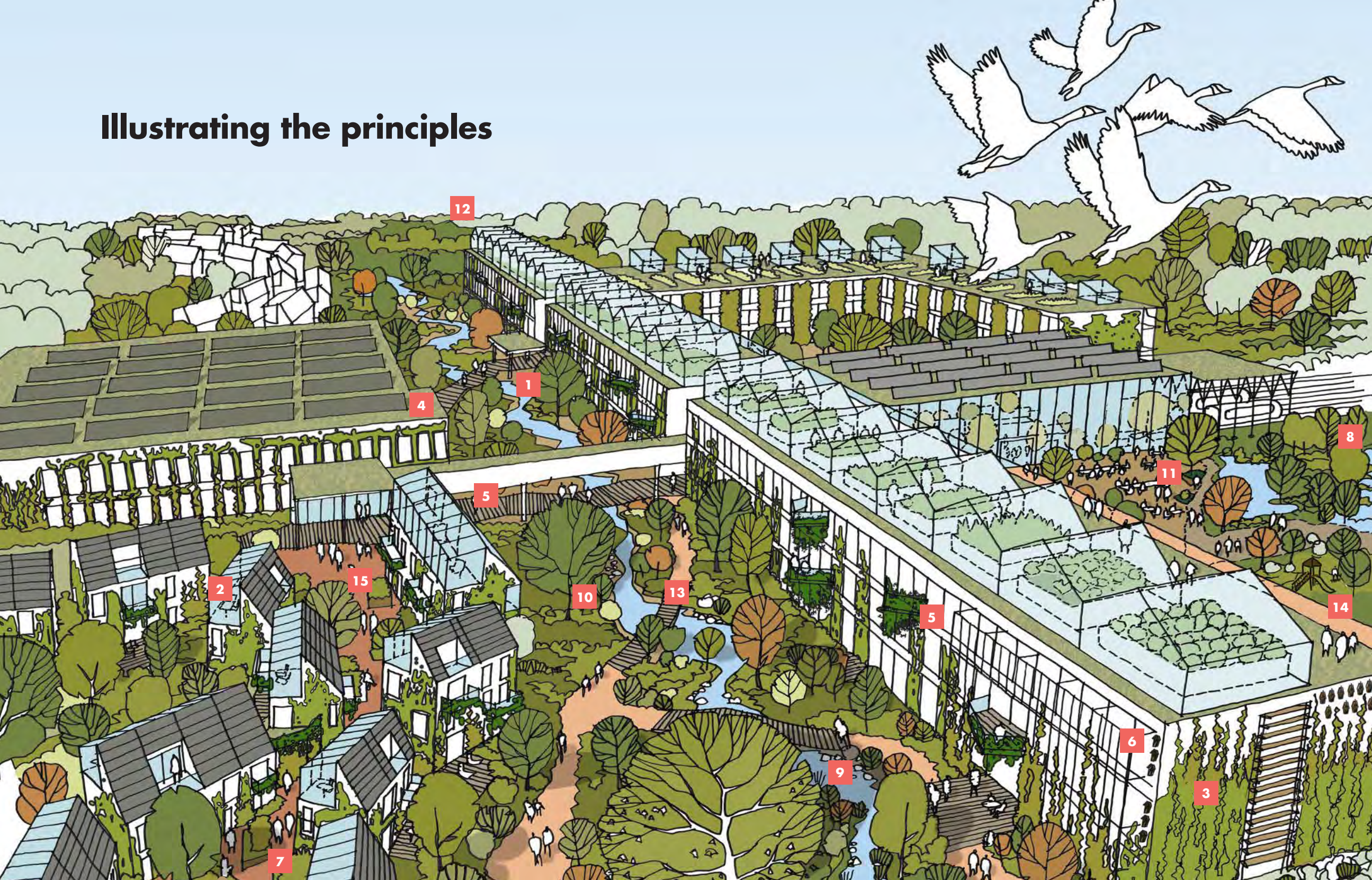
[Landscape and Urban Design for Bats and Biodiversity](#)

How to build housing in a nature-friendly way

[Homes for People and Wildlife](#)



Illustrating the principles



1. A transformative landscape and biodiversity-led design vision that creates an exciting and flourishing place for people and nature to harmoniously co-exist.
2. The position of the built form has been considered with an Ecologist and Landscape Architect so that the existing biodiversity has been retained and a new biodiversity and landscape strategy can take precedent.
3. Green walls have been incorporated into the building and landscape structures.
4. Green roofs have been incorporated into the building and landscape structures.
5. Balcony planting has been incorporated into the building and landscape structures.
6. Wildlife homes have been built-in as an intrinsic part of the built form, after detailed coordination with an Ecologist.
7. Site sourced-soil has been tested, retained, and used.
8. New wildlife habitats and homes have been designed into the landscape after coordination with an Ecologist.
9. Water bodies and SuDS have been incorporated into landscape in coordination with a Civil Engineer.
10. Tree, plant and grass mixes that maximise biodiversity and are resilient to the effects of climate change.
11. Multifunctional spaces in the landscape that have been designed with a long-term management strategy in place.
12. Biodiversity within the site connects well to existing, and future proposals for, biodiversity surrounding the site.
13. Materials used have a net positive impact on nature in their extraction and processing.
14. Play areas incorporate biodiversity.
15. Food production and composting areas.

FAQs



1 What is Biodiversity Net Gain (BNG)? How does it effect new developments?

The Environment Act sets out the following key components of mandatory biodiversity gain:

- Minimum 10% BNG is required, calculated using the Biodiversity Metric and the approval of a Biodiversity Gain Plan;
- Habitats must be secured for at least 30 years via planning obligations or [conservation covenants](#) (ideally including a Habitat Management and Monitoring Plan);
- BNG does not change existing legal protections for important habitats and wildlife species;
- BNG maintains the mitigation hierarchy of avoiding impacts first, then mitigating, and then compensating as a last resort;
- BNG will apply to Nationally Significant Infrastructure Projects (NSIPs), but not marine development;
- Metrics incentivise on-site and local delivery of BNG, with units outside

the Local Planning Authority boundary being more expensive;

- BNG can be delivered by either of the following three steps, but must follow the steps in order.
 1. On-site (all land within the boundary of a project). This is preferred, with Local Authorities more likely to approve applications where this is the route taken.
 2. Off-site (all land outside of the on-site boundary, regardless of ownership). This land needs to be registered on a national register. Developers can either:
 - (a) make off-site biodiversity gains on their own land outside the development site, or
 - (b) buy (local if possible) off-site 'biodiversity units' (Biodiversity Gain Sites set up on land to increase its biodiversity value).
 3. By purchasing statutory biodiversity credits from the government – this contribution will be used to fund biodiversity enhancements across England. Developers must prove why they cannot meet BNG using on-site and off-site options.

2 Does it cost more to take a biodiversity-led approach that goes beyond 10% BNG?

The UK Green Building Council's [Building the Case for Net Zero](#) reports that the cost uplift for intermediate climate scenarios, which could be used as a parallel for biodiversity enhancements, was 6.2% for offices and 3.5% for residential.

It notes that the project's enhanced value would likely more than offset these costs over time (e.g. higher rents, reduced running costs, higher sale price, reduced offsetting costs, etc).

For example, strong and growing evidence shows that developments that include SuDS are cheaper than traditionally drained sites. E.g. [Melton Mowbray School SuDS scheme](#), where installation costs were significantly lower than a conventional piped or underground drainage system (in the order of £100,000).

When compared to conventional grey infrastructures, a biodiversity-rich scheme provides a multitude of economic, social and ecological benefits in addition to their core purpose.

At the moment, many of these benefits and their value remain unaccounted for. But they are tangible and real. [The Value of Urban Nature-Based Solutions, May 2022, UK Green Building Council \(UKGBC\)](#)

3 How will climate change affect biodiversity on my project?

We need to design with the effects of climate change in mind e.g. using plant and tree species that can tolerate conditions caused by climate change, such as drought and waterlogged conditions.

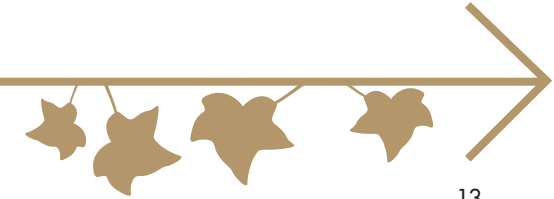
Designing-in biodiversity that is resilient to the effects of climate change will be more robust and sustainable and therefore cheaper in the long-term. For example, reduced watering costs.

4 What is a BNG Biodiversity Gain Plan?

A document which sets out how a development will deliver BNG and allows the planning authority to check whether the proposals meet the biodiversity gain objectives. It should cover:

- How adverse impacts on habitats have been minimised;
- The pre-development biodiversity value of the on-site habitat;
- The post-development biodiversity value of the on-site habitat;
- The biodiversity value of any off-site habitat provided in relation to the development;
- Any statutory biodiversity credits purchased;
- Any further requirements as set out in secondary legislation.

For the most up to date information refer to: [Understanding Biodiversity Net Gain](#)



Glossary

The Embodied Nature or Ecological Impacts:

considering our impact on biodiversity beyond just the site of development to include the extraction and production of building materials.

Biodiversity: the variety and variability of life on earth, including genes, ecosystems, and species.

Biodiversity Net Gain

(BNG): BNG requirements aim to ensure that developments have a net positive impact on biodiversity overall, by minimising any negative impacts, restoring existing areas or offsetting. To achieve 'net gain', the biodiversity value attributable to the development must exceed the pre-development value.

Environmental Net Gain

(ENG): The concept of ENG builds upon the Government's ambition to leave the environment in a 'better state' for the next generation by ensuring environmental improvements are made within all forms of development. ENG therefore expands upon existing BNG principles to take into consideration the function of wider ecosystem services, such as flood protection, recreation, and improved water and air quality.

Building with Nature:

A voluntary standard to create better places for people and nature, covering the themes of wellbeing, water and wildlife.

Biophilic design: A concept used within the building industry to increase occupant connectivity to the natural environment through the use of direct nature, indirect nature, and space and place conditions using visual and sensory references to nature.

Blue Green Infrastructure

(BGI): Naturally occurring or created, an interconnected network of waterways, wetlands, woodlands, wildlife habitats, and other natural areas; greenways, parks, and other conservation lands; working farms, ranches, and forest; and wilderness and other open spaces that support native species, maintain natural ecological processes, sustain air and water resources, and contribute to the health and quality of life for communities and people.

Carbon sequestration: The long-term storage of carbon in plants, soils, geologic formations, and the ocean.

Carbon sinks: Any process, activity or mechanism which removes a greenhouse gas, aerosol or precursor of a greenhouse gas from the atmosphere. Forests and other vegetation are considered sinks because they remove carbon dioxide through photosynthesis.

Climate resilience: Climate resilience is referred to as the capacity to anticipate, prepare for, and respond to, hazardous events or trends related to climate. With regards to the built environment, it is the ability of buildings, landscapes, and infrastructures to adapt to – and reduce the impacts of – climate-related events, such as flooding or overheating.

Ecosystem services: The benefits that people derive from the natural environment and its processes. These benefits are anthropocentric and can be categorised as provisioning services (food, water, timber, fibre), regulating services (climate, floods, disease, wastes, water quality), cultural services (recreation, aesthetics, spirituality), and supporting services (soil formation, photosynthesis, nutrient cycling), which the health and sustenance of humankind is dependent upon.

Environmental, Social and Governance (ESG):

Factors that fall outside of traditional financial metrics, yet also pose an extensive (and increasing) risk to the security of an organisation's operations or investments. For example, biodiversity loss, climate injustice, and lack of formal political support are crucial ESG issues facing nature-based solutions implementation. Broadly, ESG policies or practices are representative of corporate sustainability and organisational approaches to risk management.

Natural capital: Elements of nature that either directly or indirectly produce value and provide benefits to people, including ecosystems, species, freshwater, land, minerals, the air, oceans, and natural processes and functions.

Nature-based Solutions

(NbS): Solutions that are inspired and supported by nature, which are cost effective, simultaneously provide environmental, social and economic benefits, and help build resilience. Such solutions bring more and more diverse, nature and natural features and processes into cities, landscapes and seascapes, through locally adapted, resource-efficient, and systemic interventions.

Sustainable Drainage

Systems (SuDS): Any system utilising natural resources in place of grey infrastructure for water drainage and management.

30by30: The Wildlife Trusts are calling for at least 30% of our land and sea to be connected and protected for nature's recovery by 2030.

“No species has ever had such wholesale control over everything on Earth, living or dead, as we now have.

That lays upon us, whether we like it or not, an awesome responsibility. In our hands now lies not only our own future, but that of all other living creatures with whom we share the Earth.

David Attenborough

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This is one of four design guides in our Emergencies series. The series includes:

- Maximising Biodiversity Through Design
- Transitioning To Net Zero Carbon
- Health & Wellbeing Designed-In
- Towards A Circular Built Environment

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