THE GREEN PARTNERSHIP

BIODIVERSITY RETROFIT TOOLKIT

First steps to help you build momentum that is easier to sustain

This bite-sized toolkit makes the case for biodiversity retrofitting in the environments where people interact most with nature and provides actionable, simple interventions for estate and facilities managers aiming to achieve early wins

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STATEMENT

The Retrofit Toolkit offers guidance for biodiversity efforts. Users should verify and seek advice before acting on the guidance. The creators are not liable for any consequences resulting from its use. Users release the creators from any claims arising from its usage. The Toolkit isn't exhaustive or constantly updated. Users accept responsibility for their decisions based on the Toolkit.

INTRODUCTION

The biodiversity retrofit: a catalyst to address the quadruple crisis

The UK is facing a quadruple crisis with the impact of climate, biodiversity, healthcare, and severe economic challenges overlapping to disproportionately effect our most vulnerable and disadvantaged communities.

Although these crises are distinct, they are deeply interlinked, primarily through the poor health of environments where people interact most with nature. This situation directly impacts the quality of habitats for carbon capture, for wildlife regeneration, and for climate mitigation as well as for people's wellbeing, which in turn directly impacts landowners' natural capital value.

The current landscape

The UK government has set a legally binding target to halt the decline in species abundance by 2030 and committed to increasing the abundance of wildlife by 10% by 2042 compared with 2030 levels. New mandatory requirements are coming online relating to Biodiversity Net Gain and sustainable drainage. As a result of the landmark agreement delivered at COP15 in Montreal, many businesses are now looking at their environmental footprint through the lens of biodiversity.

Despite the urgent need, however, not enough interventions are currently being undertaken for the primary purpose of improving biodiversity, mitigating against the impacts of climate change, and increasing access to high quality green and blue space for people and wildlife.

A recent study conducted by HSBC and the Business School at Imperial College London* revealed that only 6% of corporate sustainability initiatives prioritised biodiversity conservation, signaling a significant oversight in efforts to protect and enhance natural landscapes and to safeguard UK biodiversity as part of the global effort to combat climate change.

*HSBC and the Business School at Imperial College London, Biodiversity & Sustainability Report.

Accelerating the pace of change

There is some good news, though. The research revealed that businesses are looking at changing their business models to incorporate nature conservation and/or regeneration as a strategic priority. This trend amongst sustainability leaders to better align nature with climate targets is being driven in part by the Science Based Targets Network (SBTN) first science based targets and a new global framework to measure and disclose nature-related risks though the Taskforce on Nature-related Financial Disclosures (TNFD).

The UK's transition towards nature and carbon alignment across all sectors presents a significant opportunity to address the quadruple crises through cost and revenue benefits, climate mitigation potential, health and wellbeing creation, and cultural cohesion benefits. The overlapping climate, biodiversity, healthcare, and economic crises are complex, and we won't solve them through disparate interventions. However, there needs to be a starting point.

The aim of this Toolkit is to address the limited uptake of biodiversity retrofit in environments where people interact most with nature and provide a series of 'biodiversity retrofit plug and play' solutions to help accelerate change within this nascent market, supported by risk, challenge and opportunity considerations for each.

Sam Jones
Founder
The Green Partnership
LinkedIn profile

WHAT IS BIODIVERSITY RETROFIT?

In this Toolkit we define biodiversity retrofit as incremental improvements to green infrastructure with the primary intention of taking first steps as a gateway to larger successes. The small interventions outlined in this guide are tried and tested in environments where people interact most with nature. They provide the opportunity to build early momentum towards biodiversity gain, as well as to increase stakeholder understanding, awareness and ownership.

Opportunity for habitat gain

Together, the NHS, social housing and commercial real estate sectors currently manage approximately 6 million sites across the UK. This presents a significant opportunity to achieve habitat gain through biodiversity retrofit.

10%
of the 1,700 **NHS sites** under management present an opportunity for habitat gain

1,350 acres
of **Social Housing sites** under management present an opportunity for habitat gain

1,470+ acres
of commercial **Real Estate sites** under management present an opportunity for habitat gain

What is Biodiversity and why it matters

Biodiversity is the natural environment around us, and the variety of all of the different kinds of organisms - the plants, animals, insects and microorganisms - that live within it. Every one of these live and work together in ecosystems to maintain and support healthy life on earth, and exist in delicate balance. Biodiversity directly impacts the air we breathe, the water we drink and the food we eat, and right now it's in crisis - because of us.

> "Without biodiversity, there is no future for humanity"
>
> Prof David MacDonald, Oxford University

The United Nations considers biodiversity to be our strongest natural defence against climate change. This is because our landscapes, lakes and water courses serve as natural carbon sinks, absorbing large amounts of greenhouse gas emissions. Therefore, conserving and restoring natural spaces, and the biodiversity they contain, is essential for limiting emissions and adapting to climate impacts.

UK Biodiversity Loss in Numbers

The UK is one of the most nature-depleted environments in the world

Ranks in the bottom
10%
in terms of biodiversity loss

A mere **13%**
tree cover, one of the lowest percentages in Europe

1 in 4
native mammal species, including water voles, hedgehogs, and dormice, face the risk of extinction

VALUE WORKING FOR VALUES

The opportunity to increase biodiversity value is not restricted exclusively to landowners and managers who have large scale landbanks, it can also be achieved just as effectively by those who own or manage disparate, mosaic estates. By taking appropriate action to restore, maintain and enhance biodiversity, direct positive outcomes can be achieved across these four key areas.

+ Climate Change

- Increased habitat resilience
- Carbon capture
- Helping reduce the impacts of climate change (air pollution, urban heat island, flood risk)

+ Health and Wellbeing

- Opportunities for rest, relaxation, and connection with nature
- Increased physical activity for leisure or transport
- Better mental health

+ Cultural

- Enhanced community engagement and social cohesion
- Developing younger generation's knowledge and ownership
- Gateway to encourage community to engage on matters of climate change
- Helping promote nature-based eco system services as desirable career

+ Economic

- Helping to decrease operational cost
- Creating nature-based income streams from a sense of place (tourism)
- Creating nature-based income streams from emerging habitat banking, biodiversity and carbon markets
- Increasing property values through enhanced landscapes

Parks and greenspaces in England deliver an estimated £6.6 billion of health, climate change and environmental benefits every year. 80% of people now live in towns and cities, yet one third of people do not have access to good quality green and blue space within 15 minutes of their home.

Natural England

The NHS estimates it could save up to £2billion in treatment costs if everyone in England had equal access to good quality greenspace.

Interventions to increase or improve urban green space can deliver positive health, social and environmental outcomes for all population groups, particularly among lower socioeconomic status groups. There are very few, if any, other public health interventions that can achieve all of this.

WHO Report 2017 Urban Green Space Interventions and Health

ADVOCATES

Dr Gemma Jerome, Director, Building with Nature

"Building with Nature is committed to helping to create great places for people and wildlife. Biodiversity Net Gain has pulled focus on new development and the importance of ensuring we plan and develop new places that make space for nature. In the rush to ensure all projects are ready for this new legislative driver, we can't afford to overlook the amazing opportunities to create more, bigger and better areas for wildlife in existing places. This new Biodiversity Retrofit Toolkit from The Green Partnership is a welcome addition to the resources available to built and natural environment professionals such as land and estate managers to better understand how they can take practical and achievable steps to immediately improve access to nature in and around where people live, and spend their time, to secure significant positive impacts for people and wildlife in the years to come."

Jon Cox, Found Director, Adventure Plus

"As an adventure youthwork charity working with (hundreds of) children from urban and town environments, we see the restorative effect of enabling children and young people to get out to explore and adventure in the outdoors. Whether as part of a school visit, a DofE Expedition or a youth adventure programme. The outdoors offers such an important environment in which to enable refreshment, restorative well-being and boosted self-esteem, which in turn builds confidence to believe 'I can make a positive contribution where I am."

We are delighted to be working with The Green Partnership, as we create our own Outdoor Adventure Base here in Oxfordshire, within easy reach of the 2 biggest conurbations in the UK, and are grateful for their help and advice to ensure the centre can deliver wonderful adventure experiences, whilst also increasing real biodiversity across our 80 acres. We are excited too about The Green Partnership's initiatives to restore healthy environments back in the urban environments where so many of our visitors return to. Thank you Sam Jones for this innovative yet crucial approach to restorative Biodiversity Retro-fit Toolkits. Brilliant!"

David March, Head of Environmental Sustainability, Orbit Group

"At Orbit we are committed to improving the quality of our green spaces and achieving our 30by30 biodiversity target. We believe this toolkit is a vital and accessible resource for all those seeking to improve their green spaces for the benefit of residents, wildlife and the wider community."

USING THE BIODIVERSITY TOOLKIT

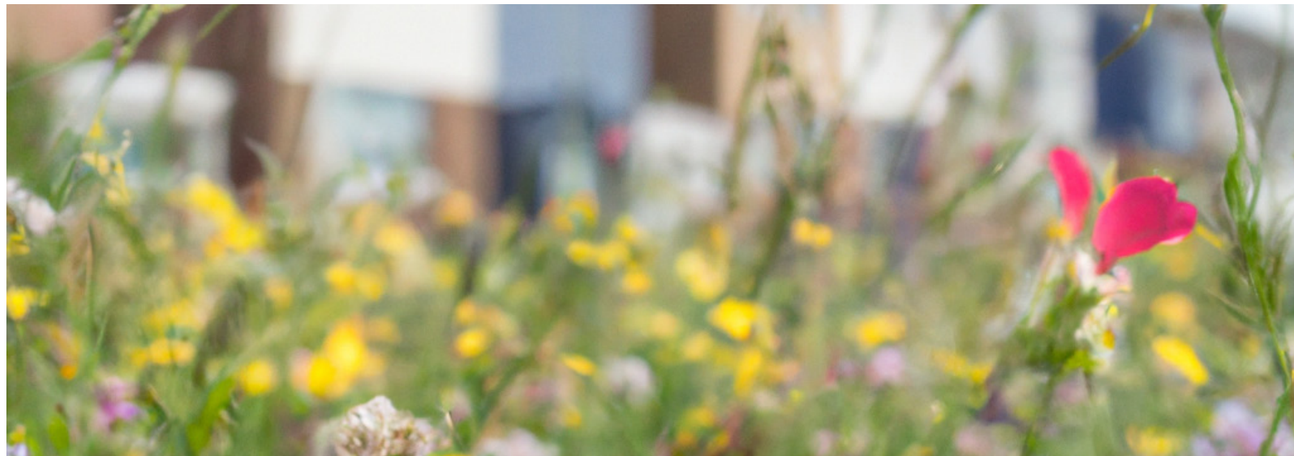
This Biodiversity Retrofit Toolkit provides a list of habitat interventions you could take as a first step to enhance the environmental, social, health and economic benefits of green infrastructure and biodiversity across your landbank.

While this is not an exhaustive list of all possible options, it covers a range of small relatively low-cost, easy to implement changes tried and tested within environments where people interact most with nature.

First review all 16 habitat interventions (there is a summary table of these options on page 12). Then choose which of the interventions (starting on page 13) you want to consider for implementation within your estate.

The notes for each habitat intervention cover:

- ☑ Applicability
- ☑ Benefits
- ☑ Considerations
- ☑ Cost
- ☑ Implementation
- ☑ Maintenance



APPLICATION

It’s essential to embark on your biodiversity journey thoughtfully, ensuring successful outcomes that benefit both nature and your community.

Essential Starting Points

- **Initial Assessments:** Evaluate site conditions and biodiversity before major work begins.
- **Consult Wildlife Experts:** Gain insights from the local Wildlife Trust or biodiversity experts to help select and tailor interventions.

Plant Selection for Success

- **Reference the Royal Horticultural Society (RHS):** Consult with RHS guidance for plant selection aligned with habitat, soil, and climate.
- **Native Diversity:** Opt for native plants to support wildlife; follow RHS guidance.

Implementing Interventions

- **Clear Communication:** Ensure stakeholders understand intervention goals.
- **Plan and Act:** Develop a schedule and execute site prep, planting, and structures.

Power of Collaboration

- **Community Involvement:** Engage locals for a shared biodiverse vision.
- **Wildlife Trust and RHS:** Maintain partnership for ongoing advice and adjustments.

For more details, visit the Royal Horticultural Society (RHS) website:
https://www.rhs.org.uk/plants

MONITORING

Monitoring is vital for assessing intervention impact, fostering improvement, and demonstrating returns on investment. Engagement with staff, the public, and volunteers adds a dynamic element, nurturing shared enthusiasm for conservation.

The Monitoring Advantage

- **Assessment:** Gauge intervention success and biodiversity impact.
- **Adaptation:** Adjust strategies based on real-time insights.
- **Engagement:** Involve all stakeholders in a collective effort.
- **Informed Decisions:** Utilise data for effective planning.
- **Education:** Raise awareness and appreciation for biodiversity.

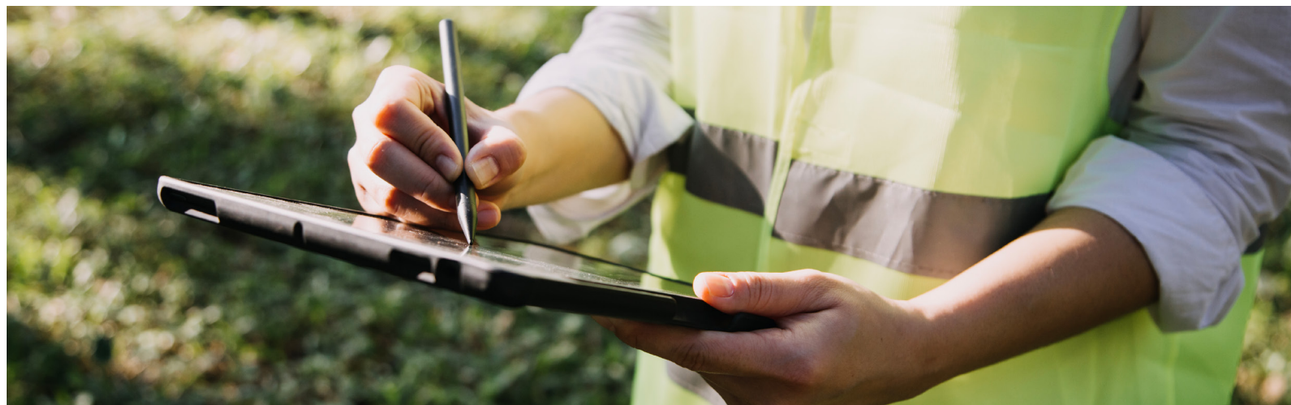
Engaging Monitoring Methods

- **General Recording:** Inclusive observations of all species.
- **Specific Schemes:** Targeted recording for experienced individuals.
- **Butterfly Transects:** Track butterfly populations along routes.
- **Flower-Insect Timed Counts:** Observe flower-visiting insects.
- **Flowering Species Count:** Monitor seasonal plant changes.

Collaboration and Tech Magic

- **Online Platforms:** Use apps for data entry and visualization.
- **Interactive Workshops:** Train participants for confident monitoring.
- **Community Events:** Celebrate progress and findings.
- **Citizen Science:** Empower participants as research contributors.

For detailed monitoring guidelines, visit the Biological Records Centre (BRC) website:
http://www.brc.ac.uk



SPECIFIC INTERVENTIONS

GRASS

Low Maintenance Lawns

Elevate biodiversity by limiting mowing in designated zones. Allowing natural growth unveils species that may signal the need for strategic interventions to further support biodiversity.

Suitable site make-up	Cost	Maintenance intensity
Any	Savings	Low

Location to Maximise Benefits:

- Adjoining woodlands and ponds. Especially good along hedgerow bases and woodland edges.

Locations to Avoid

- Areas at high-risk of anti-social behaviours, such as dog fouling and littering.

BENEFITS

- **Diverse Flora:** Allowing wildflowers and grasses to grow enhances floral variety, supporting varied wildlife, including seed-feeding birds.
- **Habitat Diversity:** Varying vegetation heights create micro-habitats, attracting diverse animals that thrive under different conditions. Longer vegetation offers shelter.
- **Cost-Effective:** Reduced maintenance expenses.

CONSIDERATIONS

- **Communicate Aesthetics:** Engage stakeholders. Clearly explain benefits to wildlife for keeping longer grass areas, mitigating concerns about untidiness.
- **Hayfever Risk**: Pollen-bearing grass and flowers mainly distant from buildings, minimising hayfever impact.

IMPLEMENTATION

- Cease or minimise mowing in designated zones.
- Allow growth to flourish.
- Consider mowing margins to prevent encroachment onto assets and neighbouring landscape areas.
- Consider supplementary plug planting or Yellow-rattle sowing for enhanced diversity.

MANAGEMENT

Year 1:

- Mow grass in March (spring cut).
- Mow mid-late July (summer cut).
- Mow late September to October (autumn cut).

Ongoing:

- Limit mows to 2-3 per year.
- Regularly mow path edges for intentional activity.
- Stagger mowing to avoid simultaneous cutting.
- Preserve some patches of longer vegetation through winter.

Wildlife Consideration:

- Keep cuttings for 1-3 days to allow wildlife to relocate.
- Avoid leaving cuttings longer to prevent excessive soil fertility.
- Relocate cuttings to other areas for wildlife food and shelter.

GRASS

Wildflower Supplementation

Boost floral diversity of existing grass areas inexpensively by augmenting wildflower seeds or wildflower plug plants. This initiative fosters habitat growth and expands resources for crucial pollinators like bees.

Suitable site make-up	Cost	Maintenance intensity
Low to Medium Density	Up to £500 (depending on scale)	Medium

Location to Maximise Benefits:
- Sunny locations.

Locations to Avoid:
- Heavily shaded or water-logged.

BENEFITS

- **Diverse Flora:** Providing greater floral diversity supports varied wildlife, including invertebrates, birds and small mammals.
- **Increased Amenity:** Increased seasonal color promotes the aesthetic quality of an area.
- **Cost-Effective:** Reduced maintenance expenses.
- **Engagement:** Potential volunteer involvement during implementation.

CONSIDERATIONS

- **Communicate Aesthetics:** Engage stakeholders. Clearly explain benefits to wildlife for keeping longer grass areas, mitigating concerns about untidiness.
- **Hayfever Risk:** Pollen-bearing grass and flowers mainly distant from buildings, minimising hayfever impact.

IMPLEMENTATION

- **Wildflower Plugs:** Plant suitable wildflower plugs after the main frosts have finished (April-May).
- **Wildflower Seeds:** Deep scarify grass areas and scatter suitable wildflower seeds before or after the main frosts have finished (October/November or February/March).

MANAGEMENT

Year 1:
- Mow grass in March (spring cut).
- Mow mid-late July (summer cut).
- Mow late September to October (autumn cut).

Ongoing:
- Limit mows to 2-3 per year.
- Regularly mow path edges for intentional activity.
- Stagger mowing to avoid simultaneous cutting.
- Preserve some patches of longer vegetation through winter.

Wildlife Consideration:
- Keep cuttings for 1-3 days to allow wildlife to relocate.
- Avoid leaving cuttings longer to prevent excessive soil fertility.
- Relocate cuttings to other areas for wildlife food and shelter.

GRASS

Wildflower Meadows

Create new florally diverse and resilient meadow areas through seeding or turfing of wildflowers. This initiative enhances amenity value and fosters the creation of new habitats and expands resources for crucial pollinators like bees.

Suitable site make-up	Cost	Maintenance intensity
Low to Medium Density	Over £1000	Medium

Location to Maximise Benefits:
- Sunny locations.

Locations to Avoid:
- Heavily shaded or water-logged.

BENEFITS

- **Diverse Flora:** Providing greater floral diversity supports varied wildlife, including invertebrates, birds and small mammals.
- **Increased Amenity:** Increased seasonal coluor promotes the aesthetic quality of an area.
- **Engagement:** Potential volunteer involvement during implementation.

CONSIDERATIONS

- **Cost:** Change of use of area can lead to high implementation costs.
- **Communicate Aesthetics:** Engage stakeholders. Clearly explain benefits to wildlife for keeping longer grass areas, mitigating concerns about untidiness.
- **Hayfever Risk:** Pollen-bearing grass and flowers mainly distant from buildings, minimising hayfever impact.

IMPLEMENTATION

- Prepare area with soil, low in fertility.
- **Wildflower Seeds:** Scatter suitable wildflower seeds before or after the main frosts have finished (October/November or February/March).
- **Wildflower Turf:** Lay suitable wildflower turf before March (best results September to December).

MANAGEMENT

Year 1:
- Mow grass in March (spring cut).
- Mow mid-late July (summer cut).
- Mow late September to October (autumn cut).

Ongoing:
- Limit mows to 2-3 per year.
- Regularly mow path edges for intentional activity.
- Stagger mowing to avoid simultaneous cutting.
- Preserve some patches of longer vegetation through winter.

Wildlife Consideration:
- Keep cuttings for 1-3 days to allow wildlife to relocate.
- Avoid leaving cuttings longer to prevent excessive soil fertility.
- Relocate cuttings to other areas for wildlife food and shelter.

PLANTS

Native, Flowering and Herbaceous Planting

Increase biodiversity and amenity of existing ornamental planted beds, raised planters or pots by introducing desirable native species, flowering shrubs and annual / perennial herbaceous plants.

Suitable site make-up	Cost	Maintenance intensity
Any	Up to £500 (depending on scale)	High

Location to Maximise Benefits:
- Existing beds where possible.
- 'Right plant, right place' ethos.
- Full sun very good for pollinator-friendly plants.

Locations to Avoid:
- Very shady, dry or waterlogged ground.

BENEFITS

- **Diverse Flora:** Supplementing greater floral diversity provides resources and habitat that supports varied wildlife, including pollinators, invertebrates and small mammals.
- **Increased Amenity:** Increased seasonal colour promotes the aesthetic quality of an area.
- **Engagement:** Potential volunteer involvement during implementation.

CONSIDERATIONS

- **Maintenance:** Clearly Diversity of plant species may lead to more complex maintenance regimes.

IMPLEMENTATION

- Plant at ideal times for the species. Spring and autumn, is recommended.
- Tailor planting approach based on species-specific advice.
- Prioritise native species.
- Consider drought tolerant species to help mitigate impacts from climate change.
- Consider supplementing with non-invasive species that flower when native species are less abundant.
- Avoid double-flowered varieties that provide limited pollinator resources.
- Incorporate plants within existing ornamental areas.
- Integrate shrubs and herbaceous plants known to be pollinator friendly.

MANAGEMENT

- Pruning in line with best horticultural practices relevant to the species.
- Limit pruning where possible to after plants having flowered.
- Consider watering during dry periods to avoid plant failure. Where possible use sustainable water sources e.g. rain water butts.

PLANTS

Climbing Plants

Utilise vertical spaces through the introduction of climbing plants to provide habitat and resources for invertebrates and pollinators.

Suitable site make-up	Cost	Maintenance intensity
Any	Up to £250 (depending on scale)	Medium

Location to Maximise Benefits:
- Full sun very good for pollinator-friendly plants.

Locations to Avoid:
- Very shady or wind susceptible areas.

BENEFITS

- **Optimise space:** Increase floral diversity where space is limited to provide resources and habitat that supports varied wildlife.
- **Increased vertical structure:** Possible additional nesting locations for birds.
- **Engagement:** Potential volunteer involvement during implementation.

CONSIDERATIONS

- **Maintenance:** Diversity of plant species may lead to more complex maintenance regimes.
- **Watering:** Planter or pot-based planting will lead to increased need for watering during warmer weather conditions.
- **Asset Integrity:** Poorly placed climbing plants can lead to asset damage.

IMPLEMENTATION

- Plant at ideal times for the species, autumn is recommended.
- Tailor planting approach based on species-specific advice.
- Prioritise species known to be pollinator friendly.
- Avoid double-flowered varieties that provide limited pollinator resources.
- Install wires or trellis on appropriate vertical surfaces to stabalise and encourage plant growth.

MANAGEMENT

- Pruning in line with best horticultural practices relevant to the species.
- Limit pruning where possible to after plants having flowered.
- Train plants to grow over the wire frame.
- Consider watering during dry periods to avoid plant failure. Where possible use sustainable water sources e.g. rain water butts.

Good for Engagement

PLANTS

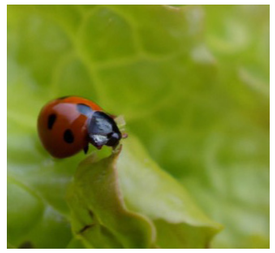
Support biodiversity, health and wellbeing with the introduction of organic edible planting or vegetable plots.

Edible Planting

Suitable site make-up	Cost	Maintenance intensity
Medium to Low Density	Up to £1000 (depending on scale)	High

Location to Maximise Benefits:
- Partial sun very good for most edibles.
- Close proximity to boundary hedges or neighbouring green spaces.

Locations to Avoid:
- Very shady or wind susceptible areas.
- Areas at high-risk of anti-social behaviours.



BENEFITS

- **Biodiversity Support:** Organic fruit and vegetable plants contribute to biodiversity.
- **Nutritious and Affordable Food:** Supply of fresh, organic, and cost-effective produce, enhancing health and well-being.
- **Social Cohesion and Ownership:** Opportunities for community gardening groups.

CONSIDERATIONS

- **Maintenance:** Diversity of plant species may lead to more complex maintenance regimes and reliance on increased water consumption.

IMPLEMENTATION

- Procure or construct raised beds and containers with volunteer groups, aided by expert guidance and materials. Identify suitable locations for these installations.
- Obtain substrate, vegetable, and fruit plants or seeds.
- Implementation can occur at any time suited to the plants being grown, allowing for adaptable scheduling.

MANAGEMENT

- Regularly prune fruit trees and bushes. Harvest fruit and vegetables, and re-sow annual vegetable plants as needed, based on growth and harvest frequency.
- Maintain areas to prevent overgrowth, ensuring optimal conditions for plant health.
- Provide regular watering as necessary to support plant growth and productivity

HEDGES & SCRUB

Encourage wider, denser hedges and taller trees through reduced pruning to boost vital resources like flowers, fruits, and nuts. This nurtures pollinators, invertebrates, birds, and mammals.

Low Maintenance Hedges

Suitable site make-up	Cost	Maintenance intensity
All (where existing hedgerows)	Savings	Low

Location to Maximise Benefits:
- Existing hedges on boundaries of property or in remote areas of site.

Locations to Avoid:
- Hedges bordering assets, parking spaces, vision splays or access/egress routes.

BENEFITS

- **Diverse Flora:** Supplementing greater floral diversity provides resources and habitat that supports varied wildlife, including pollinators, invertebrates and small mammals.
- **Increased Nesting:** Additional nest sites and shelter for birds and small mammals.
- **Cost-Effective:** Reduced maintenance expenses.

CONSIDERATIONS

- **Communicate Aesthetics:** Engage stakeholders. Clearly explain benefits to wildlife for keeping ‘wilder’ hedges, mitigating concerns about untidiness.

IMPLEMENTATION

- Trim less to promote wider, denser hedgerows with standard trees.
- Trim in ‘A’ shape with optimal height and width at least 1.2m high and 1m wide.

MANAGEMENT

- Suggest one cut every 2-3 years, excluding bird nesting season (Feb-Aug).
- Prioritise flowering resources by avoiding cuts during main flowering periods.
- Opt for light trimming over intensive cuts for favourable outcomes.

Good for Engagement

HEDGES & SCRUB

Connected Native Hedges

Native hedgerows that are continuous and connected offer wildlife nourishment, refuge, corridors and nesting spots. This nurtures pollinators, invertebrates, birds, and mammals, while creating essential networks for nature.

Suitable site make-up	Cost	Maintenance intensity
All	Under £500 (depending on scale)	Medium

Location to Maximise Benefits:
- Augmentation of existing hedges.
- Where good soil provisions (if creating new hedge).

Locations to Avoid:
- Areas at high-risk of anti-social behaviours
- Areas with poor subsoil levels.

BENEFITS

- **Biodiversity Support:** Increased food, shelter, and nesting for wildlife.
- **Climate Change Resilience:** Contributing to flood control and attenuation.
- **Site Privacy:** Noise reduction, security and concealing unsightly views.
- **Engagement:** Potential volunteer involvement during implementation.

CONSIDERATIONS

- **New Hedge Impacts:** Consider the impacts of creating new hedges on light levels into properties, maintenance and access or egress across sites.

IMPLEMENTATION

- Clear the area of existing vegetation.
- Plant native species in a double staggered layer using bare root whips. Support and protect with stakes and guards if required for location.
- Plant from November to March, avoiding extreme cold or windy weather.
- Prevent root damage by avoiding frozen or waterlogged soil.

MANAGEMENT

Initial 1-3 years
- Regular pruning for desired structure, using spring, summer, and autumn/winter cuts.

Ongoing:
- One cut every 2-3 years, avoiding bird nesting season (Feb-Aug).

General Considerations:
- Timing varies based on hedge goals and thriving tree species.
- Avoid cuts during main flowering seasons
- Opt for light trimming when established, avoiding heavy cuts.

HEDGES & SCRUB

Scrub

Retain and enhance areas of scrub and brambles and manage with rotational cutting to create diverse habitat structures abundant with resources for wildlife.

Suitable site make-up	Cost	Maintenance intensity
Any	Savings	Low

Location to Maximise Benefits:
- Sunny spots adjacent to other habitats.

Locations to Avoid:
- Ideally away from boundary fences.
- Close proximity to neighboring properties
- Immediately adjacent to footpaths and cycle ways (risk of thorns).

BENEFITS

- **Structured Habitats:** Creates habitat mosaic and enhanced structural diversity, fostering increased biodiversity.
- **Nature Resources:** Offers nectar, seeds, fruits, shelter, and nesting opportunities for various invertebrates, birds, and mammals.
- **Cost-Effective:** Reduced maintenance expenses.

CONSIDERATIONS

- **Communicate Aesthetics:** Engage stakeholders. Clearly explain benefits to wildlife for keeping 'wilder' hedges, mitigating concerns about untidiness.

IMPLEMENTATION

- Less intensive management of areas with scrub like properties to allow habitats to thrive.
- If planting new scrub-friendly plants this is best done in the autumn / early winter. Ideally select a native variety rather than a garden cultivar.

MANAGEMENT

- Conduct management in autumn/winter, particularly early February, while avoiding the bird nesting season.
- Prevent encroachment through rotational cutting to promote habitat diversity.
- Plan work on fruit-bearing scrub after December to preserve food sources for wildlife during autumn and winter.
- Implement rotational cutting for bramble-dominated scrub patches, cutting a portion each year to create diverse growth stages over 5-6 years.

Good for Engagement

TREES

Native Trees & Woodland

Planting native tree species and replacing non-native or coniferous trees with natives, where suitable, contributes to enhanced biodiversity.

Suitable site make-up	Cost	Maintenance intensity
All (depending on space available)	Up to £500 (depending on scale)	Medium

Location to Maximise Benefits:
- Augmentation of existing hedges or woodland boundaries.

Locations to Avoid:
- Close proximity to buildings, hard surfaces or below ground services.
- Areas with poor subsoil levels.

BENEFITS

- **Biodiversity Enrichment:** Improved floral and invertebrate variety.
- **Climate Change Resilience:** Source of carbon sequestration, improved urban cooling and aids in flood attenuation.
- **Engagement:** Potential volunteer involvement during implementation.

CONSIDERATIONS

- **Asset Integrity:** Mature trees can impact buildings, causing structural damage through root penetration, tree falls, and branch breakage. Allow ample room for root and canopy growth to mitigate risks.

IMPLEMENTATION

- Select and procure native tree species for planting. Opt for flowering and fruit bearing varieties (avoiding double-flowered types).
- Gradually replace conifers with native trees.
- Schedule conifer removal between September and January, ensuring no tree cutting during the bird nesting season (typically February to August).
- Plant new trees between November and March, avoiding very cold or windy conditions. Support and protect with stakes and guards if required for location. Refrain from planting in frozen or waterlogged soil.

MANAGEMENT

- Regularly water during dry spells for 3-5 years to support root growth.
- Remove guards before disintegration (around 5-10 years) and check tree ties and stakes to prevent rubbing damage.
- Prune in line with best arboricultural practice moving forward.

Good for Engagement

TREES

Orchards

From traditional to community orchards, urban landscapes host vital habitats. Orchards, when thoughtfully managed with natural traits like spaced trees and varied fruits, become havens for diverse wildlife.

Suitable site make-up	Cost	Maintenance intensity
Low to Medium Density	Up to £1000 (depending on scale)	Medium

Location to Maximise Benefits:
- Locality where community are keen to be involved.
- Where good soil provisions.

Locations to Avoid:
- Close proximity to buildings, hard surfaces or below ground services.
- Areas with poor subsoil levels.

BENEFITS

- **Biodiversity Enrichment:** Improved floral and invertebrate variety.
- **Sustainability:** Source of carbon sequestration, removal of excess nutrient burdens and aids in flood attenuation.
- **Nutritious and Affordable Food:** Supply of fresh, organic, and cost-effective produce.
- **Engagement:** Potential volunteer involvement.

CONSIDERATIONS

- **Asset Integrity:** Mature trees can impact buildings, causing structural damage through root penetration, tree falls, and branch breakage. Allow ample room for root and canopy growth to mitigate risks.

IMPLEMENTATION

- Select and procure native or naturalised tree species for planting. Opt for flowering and fruit bearing varieties (avoiding double-flowered types).
- Plant new trees between November and March, avoiding very cold or windy conditions. Support and protect with stakes and guards if required for location. Refrain from planting in frozen or waterlogged soil.

MANAGEMENT

- Regularly water during dry spells for 3-5 years to support root growth.
- Remove guards before disintegration (around 5-10 years) and check tree ties and stakes to prevent rubbing damage.
- Prune in line with best arboricultural practice moving forward.
- Pick fruit at optimum time of year. Consider leaving small amounts of windfall fruit as food source for ground level invertebrates and mammals.
- Manage orchard grassland by adopting a mowing regime that enables access and egress around the area but sustains appropriate grassland heights and diversity to retain biodiverse habitats.

Good for Engagement

WATER

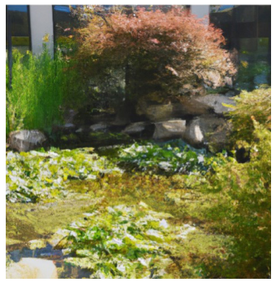
Ponds

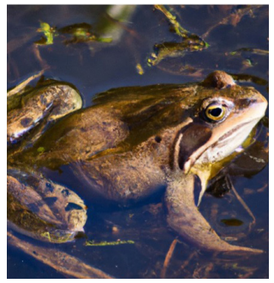
Ponds serve as vital sanctuaries and pathways for urban species. These aquatic ecosystems sustain diverse freshwater flora and fauna, offering invaluable support to urban biodiversity.

Suitable site make-up	Cost	Maintenance intensity
Low to Medium Density	Up to £1000 (depending on scale)	Medium

Location to Maximise Benefits:
- Range of sizes so design to size of space.
- Must have some sunlight.
- Nearby a water source (ideally harvested vs. mains fed).

Locations to Avoid:
- Where children might visit unsupervised.
- Near trees to avoid excessive leaf fall.





BENEFITS

- **Supportive Habitat:** Fosters diverse freshwater plants, aquatic/semi-aquatic animals, and terrestrial creatures.
- **Nature Resources:** Provides drinking, feeding, and bathing opportunities for various species.
- **Engagement:** Potential volunteer involvement.

CONSIDERATIONS

- **Safety:** Finding suitable locations and gaining buy-in can be tricky due to perceived safety issues. However, ponds do not need to be deep and careful design can usually reduce risk and enhance the ponds biodiversity value.

IMPLEMENTATION

- Enlist specialist contractors to design and install larger and complex pond structures.
- Engage volunteers for smaller pond creation, fostering ownership. Consider container ponds, by repurposing water-tight items like tubs, sinks, or plant pots.

MANAGEMENT

- Frequent check on water levels, which might need topping up.
- Check for and remove litter.
- As the pond matures, periodically clear some vegetation and perform sediment dredging.
- Sunken container ponds may need swift attention, maintaining open water.
- Prevent invasive non-native plant species by managing bare pond edges.

WATER

Rain Gardens

Rain gardens act as sustainable drainage systems that can house biodiverse and more flood-tolerant planting schemes.

Suitable site make-up	Cost	Maintenance intensity
Any	Up to £1000 (depending on scale)	Medium

Location to Maximise Benefits:
- In situ of rainwater run-off via non-porous hard surfaces or building downpipes.

Locations to Avoid:
- Locations where sunken planters and absorbent soils cannot be easily installed.

BENEFITS

- **Biodiversity Enrichment:** Elevated plant and invertebrate diversity benefiting overall biodiversity.
- **Sustainability:** Flood reduction and enhanced water quality.
- **Cost-Effective:** Reduced maintenance expenses compared to traditional planted beds.

CONSIDERATIONS

- **Cost:** Change of use of area can lead to high implementation costs.

IMPLEMENTATION

- Formed through the creation of a shallow depression with absorbent, well-draining soil.
- Plant with suitable species that tolerate intermittent temporary flooding.
- Enlist a specialist contractor where significant changes are required to hard surface structures, existing drainage structures or the need for absorbent soils.

MANAGEMENT

- Undertake occasional weeding to remove unwanted or invasive vegetation.
- Undertake annual pruning of vegetation in line with best horticultural practice.

BUILT HABITATS

Green Roofs & Living Walls

Green roofs and living wall systems offer viability for habitat creation in urban spaces.

Suitable site make-up	Cost	Maintenance intensity
Any (with appropriate surfaces)	Over £1000	Roofs: Low Walls: High

Location to Maximise Benefits:
- Full sun for living roofs.
- South or southeast orientation for living walls.

Locations to Avoid:
- Roof with low weight bearing capacity.
- Roofs or external wall spans with poor access.

BENEFITS

- **Biodiversity and Habitat:** Increases wildlife attraction and promotes biodiversity.
- **Environmental Impact:** Enhances flood control, regulates temperatures, improves air quality, and absorbs sound.
- **Energy Efficiency:** Reduces energy consumption, extends roof lifespan with protection from UV.

CONSIDERATIONS

- **Financial Aspect:** Involves high costs.
- **Installation and Maintenance:** Requires specialised installation and ongoing maintenance.
- **Access Challenges:** Necessitates access to roof and upper wall sections for consistent upkeep.
- **Leakage Complexity:** Addressing leaks is more challenging due to the unique structure.

IMPLEMENTATION

- Utilise well tested green or brown roofs, biosolar roofs, or living wall systems.
- Collaborate with specialised contractors for precise design, installation, and ongoing care.

MANAGEMENT

Green Roofs
- Biannual maintenance for gutter clearing, growth removal, and invasive species control.
- May require supplementary watering and plant replacements; timing depends on roof type and weather.
- Intensive green roofs require higher maintenance.

Living Walls:
- Regular maintenance is essential including dead plant removal, weeding, fertilsiing, plant replacement and watering or irrigation system maintenance.

BUILT HABITATS

Boxes and Hotels

Safe locations for nesting and hyphenating can be created through the introduction of nest boxes and hotels for key wildlife such as bats, birds, hedgehogs, solitary bees, and 'bugs'."

Suitable site make-up	Cost	Maintenance intensity
Medium to Low Density	Under £250	Low

Location to Maximise Benefits:
- **Bats** – trees, building or pole mounted. 2 or 3 together. Close to tree lines and hedges.
- **Bees** – south facing wall or sunny location. Sheltered from wind. 1m off the ground. Access to pollen rich habitats.
- **Birds** – Depends on bird species and proximity of other habitats. Utilise when few mature trees on site.
- **Bugs** - Close to other habitats, especially ponds and wetlands.
- **Hedgehogs** – Shady, dry places away from noise, crowds and pets.

Locations to Avoid:
- **Bats** – where likely to have extensive building works or maintenance (legally protected).
- **Bees** – where susceptible to driving rain and poor proximity of foraging opportunities. Avoid proximity to play areas.
- **Birds** – where poor protection for predators, especially cats. Avoid full sunlight to reduce risk of overheating.
- **Bugs** - Sites in full sun or that can become waterlogged.
- **Hedgehogs** – Busy places with likelihood of predators, pets or close to main roads.

BENEFITS

- **Nesting Habitats:** Increases nesting sites, refuges from predators and overwintering sites.
- **Engagement:** Potential volunteer involvement.

CONSIDERATIONS

- **Legal Protection:** Bats, Hedgehogs and many species of birds are legally protected in the UK, requiring consideration over the long-term considerations of encouraging nesting on site.
- **Nest Locality:** Consider impacts and benefits of where each box or hotel is located.

IMPLEMENTATION

- Obtain or construct nesting boxes and bug hotels.
- Install them strategically across the site, avoiding excessive sunlight.
- Opt for multiple smaller habitats instead of a single large one.

MANAGEMENT

Enlist a specialist to assess and undertake ongoing maintenance requirements. In particular, once occupied, a bat box cannot be opened legally without a Natural England license and may be used for many years.

Good for Engagement

BUILT HABITATS

Habitat Piles

Dead wood serves as valuable wildlife habitat. Loggeries and log piles offer essential structural homes and food sources for a range of creatures, from invertebrates to amphibians, reptiles, and mammals.

Suitable site make-up	Cost	Maintenance intensity
Medium to Low	Under £250	Low

Location to Maximise Benefits:

- Site the logs in partial shade to prevent them drying out.
- **Locations to Avoid:**
  Places that will be disturbed frequently.
- Highly waterlogged places.

BENEFITS

- **Habitat Provision:** Structural habitat for invertebrates, reptiles, and mammals and potential nesting sites for certain bird species like wrens and robins. Loggeries specifically benefit the nationally scarce Stag Beetle (if present locally).
- **Crucial Resource:** Supports wood-feeding and wood-boring invertebrates.
- **Engagement:** Potential volunteer involvement.

CONSIDERATIONS

- **Communicate Aesthetics:** Engage stakeholders. Clearly explain benefits to wildlife for piles, mitigating concerns about untidiness.

IMPLEMENTATION

- Log pyramids can be built at any time of year.Use wood from any broadleaved tree
- Logs should be at least the thickness of an adults arm.
- Partially bury the logs in the soil so that they don't dry out.
- Allow plants to grow over the log pyramid to retain moisture and provide shade.

MANAGEMENT

- With minimal disturbance, ongoing management isn't required. However, to ensure consistent habitat, consider constructing a new pile every 5 to 10 years. This maintains a steady environment for the deadwood species drawn to the area.

SUPPORTING YOU

Biodiversity in the UK is in trouble. Mitigating this disaster is a huge challenge, and one for which we all bear responsibility. While the scale of the challenge is vast and complex, this Biodiversity Retrofit Toolkit distils the first steps landowners and managers can take to build early momentum and unlock the full potential of green infrastructure. Bourne from The Green Partnership's unique perspective and knowledge of eco system services. We stand ready to help and look forward to providing expert guidance to your organisation as we move towards a future where biodiversity is in balance.

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The Green Partnership