Greengage

Biodiversity and Real Estate

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Biodiversity is in crisis

- Biodiversity underpins ecosystems
- Ecosystems underpin humanity
- Decline in biodiversity is one of the greatest threats we face
- **Biodiversity crisis entirely interlinked with climate emergency**
- Urgent need to address decline
- **No one is immune from impact**

One in 10 UK wildlife species faces extinction, major report shows

State of Nature reveals the destructive impact of intensive farming, urbanisation and climate change on plants, animals and habitats

Destruction of nature as dangerous as climate change, scientists warn

Unsustainable exploitation of the natural world threatens food and water security of billions of people, major UN-backed biodiversity study reveals

▲ A dead Boóó fish in front of stranded floating houses on the bed of Negro River, a major tributary of the Amazon River, during a drought in 2015. Photograph: Raphael Alves/AFP/Getty Images

Human destruction of nature is rapidly eroding the world's capacity to provide

Europe faces 'biodiversity oblivion' after collapse in French birds, experts warn

Authors of report on bird declines say intensive farming and pesticides could turn Europe's farmland into a desert that ultimately imperils all humans

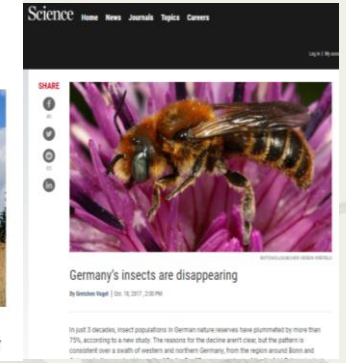
▲ A red-legged partridge in Burgundy. Eight in 10 partridges have disappeared from France in 25 years, a study showed. Photograph: Pierre Vernay / Biosphoto/Alamy

Green Brexit unlikely despite government claims, report concludes

Environmental standards are at risk across the board, from wildlife and habitats to water and air quality, a risk assessment shows

▲ Fowlmere RSPB reserve in Cambridgeshire, which is home to a chalk stream, one of the UK's rarest habitats. Photograph: Alastair Laming/Alamy Stock Photo

Government promises of a green Brexit have been cast into doubt by a new study that warns of declining protections for water, birds and habitats once Britain



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Germany's insects are disappearing

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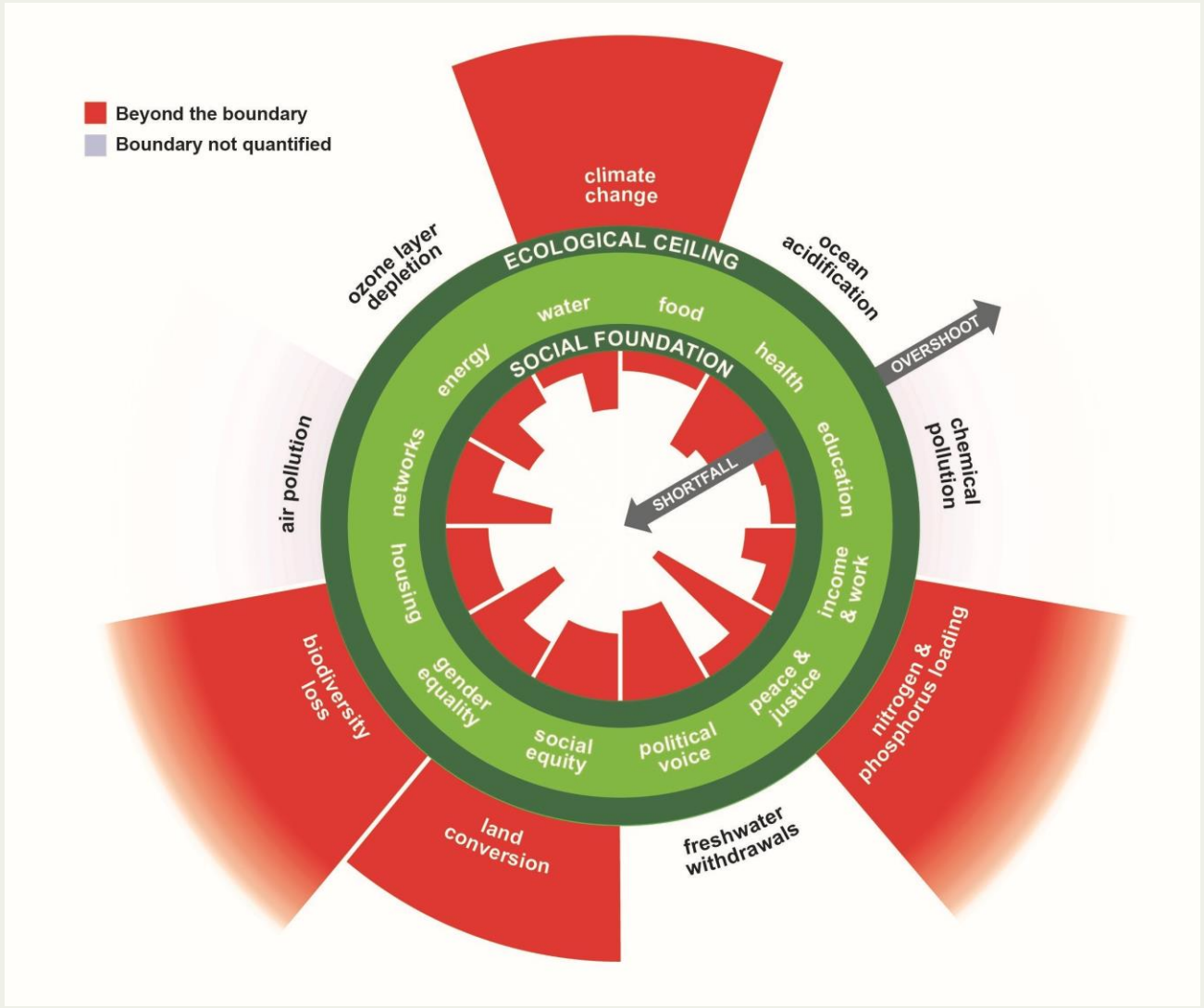
Beyond the boundary
Boundary not quantified
climate change
ozone layer depletion
ocean acidification
chemical pollution
air pollution
biodiversity loss
land conversion
freshwater withdrawals
nitrogen & phosphorus loading
ECOLOGICAL CEILING
SOCIAL FOUNDATION
OVERSHOOT
SHORTFALL
water
food
health
education
income & work
peace & justice
political voice
social equity
gender equality
housing
networks
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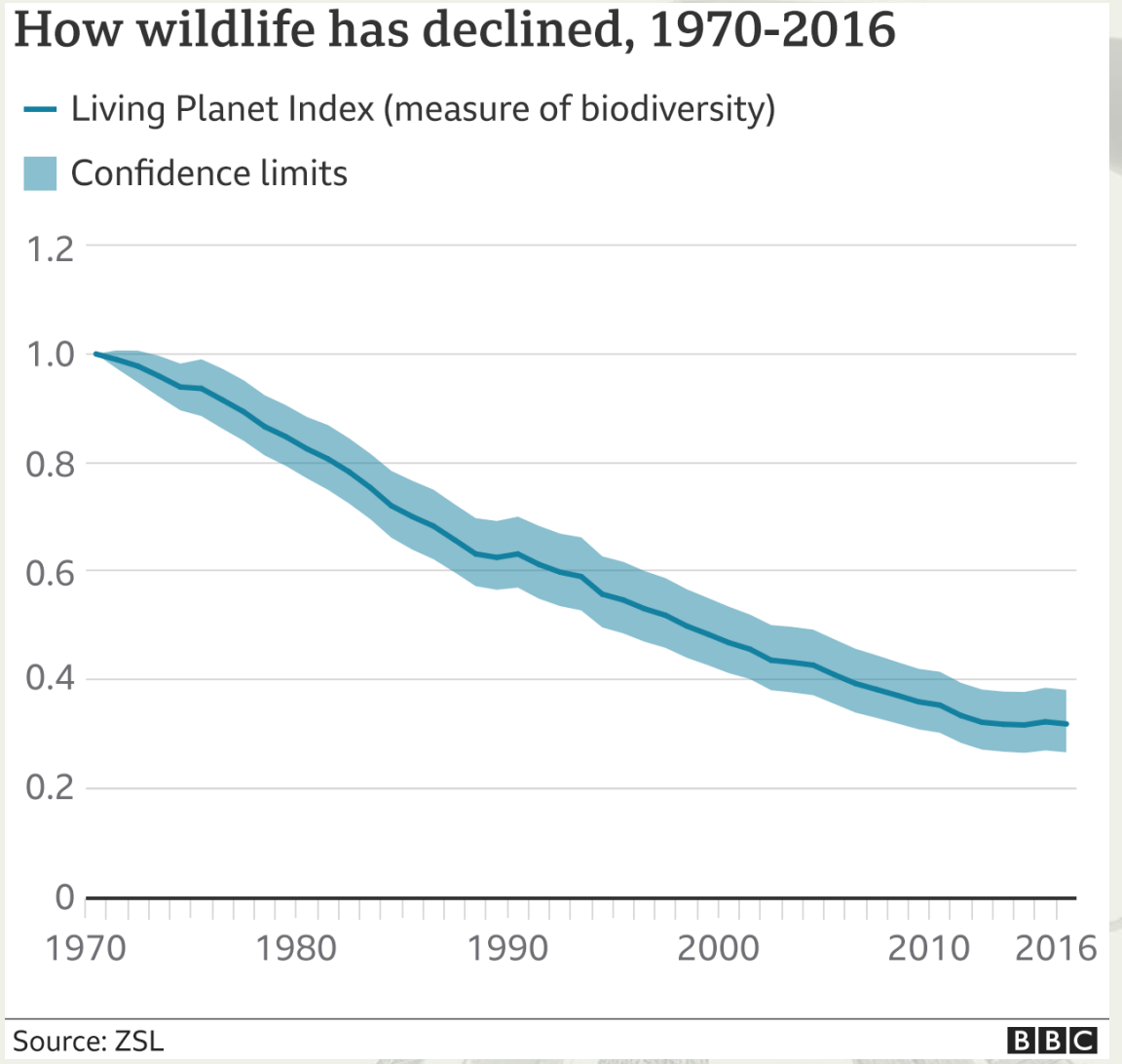
How wildlife has declined, 1970-2016
Living Planet Index (measure of biodiversity)
Confidence limits
1.2
1.0
0.8
0.6
0.4
0.2
0
1970
1980
1990
2000
2010
2016
Source: ZSL
BBC

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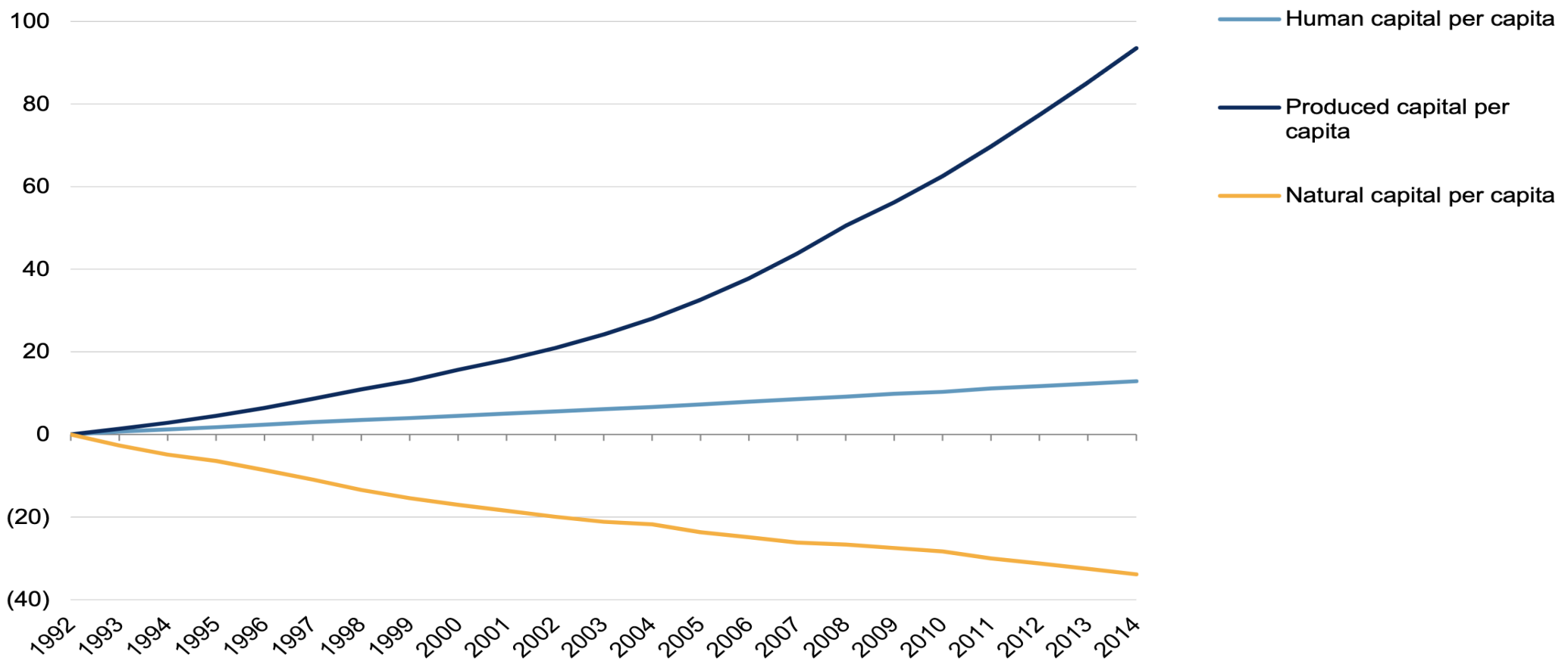
Why does this matter?

- Greater biodiversity = greater ecosystem value
- Ecosystems deliver ‘services’ – the flow of tangible benefits derived from nature
- £ trillions value in the UK :
  - Carbon sequestration
  - Agro-economy
  - Health and well-being
  - Climate change adaptation and mitigation
  - Flood alleviation
  - Tourism
- Ecosystems rely on their species/habitats
- Protect biodiversity → protect ecosystems → protect services

Chart 1

The Value Of The Stock Of Natural Capital Has Declined By Nearly 40% In The Past 20 Years

Global wealth per capita: 1992-2014



Source: Managi and Kumar, 2018.

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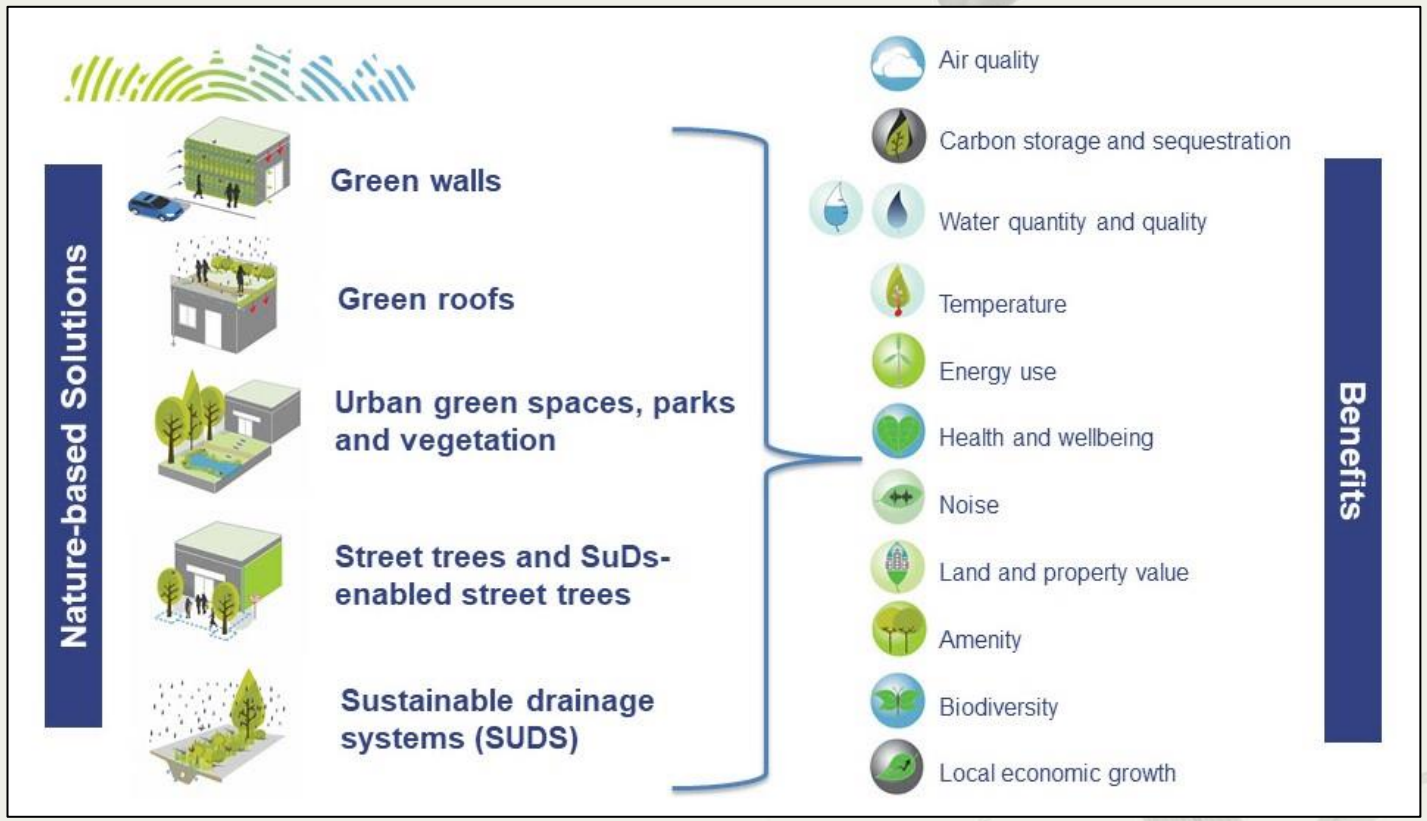
Real estate must contribute and adapt

- New development must meet improving regulatory standards in planning
- Assets must embed resilience to climate change, biodiversity crisis and other societal stressors
- Owners, managers and developers therefore subject to increasingly complex drivers set against regulatory and reporting framework

The solution

- Use nature
- Nature-based Solutions (NbS) are increasingly recognised as an effective means of tackling the climate and ecological crises, and delivering liveable and resilient towns and cities.
- NbS should be considered a critical form of infrastructure and a key component in both current and future ‘placemaking’
- Three case studies for differing real estate models presented



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Social Housing Provider

Public Realm Landscape Management

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Flagship Group

- Long term experiment on nature, soil carbon and social value
- Two estates, each with four ‘test treatments’ for public spaces
- Data on biodiversity, carbon, social response, capex and opex captured
- Outcomes to be used to inform and support nature positive approach across entire portfolio

Promoting nature at St Andrew's Place

What are we doing?

With 15% of UK species threatened with extinction, at Flagship we want to play our part in giving nature a helping hand. We've partnered with Greengage (an ecological consultancy) and Levitt Bernstein (an architectural firm) to set up an urban wilding project, to create spaces where plants and wildlife can thrive. And you, and the local community, can enjoy nature.

What Is Urban Wilding?

Urban wilding is a way of managing green space that allows nature to play a bigger role. It creates habitat for wildlife and increases access to nature for the community that surrounds it.

What to look out for

- Watch how the spaces change over the coming weeks and months!
- Can you see any plants, animals, or insects that you've not seen here before?
- What are the differences between the areas? Which do you prefer?

Showcase Area

Four small examples of each of the spaces so you can compare them side by side.

- A Natural Response
- B Intensive Mowing
- C Fully Landscaped
- D Wildflower Meadow

Follow the trail and explore the spaces!

Flagship Group Levitt Bernstein People.Design Greengage

4 Wildflower Meadow

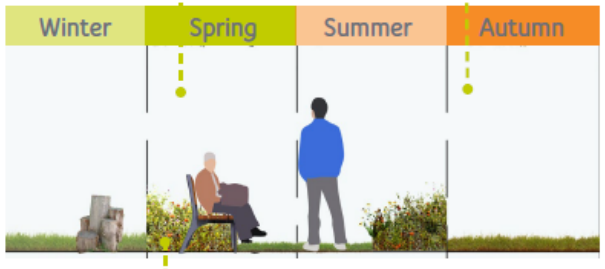
You are here

What are we doing?

We've started a wildflower meadow by sowing a seed mix containing a range of native grasses and wildflowers. The grass will be kept short in autumn in winter, but mowing will stop in spring to allow the wildflowers to grow over the summer.

How the area will change throughout the year

The best time to see the wildflowers will be between April and September



Mowing of the wildflower area will stop in late April to allow the wildflowers to grow over the summer.

What you might spot

Look out for different plants, animals and insects in this area!

A loggery is an installation of dead wood that provides an important habitat for insects

Bringing nature to St Andrew's Place

Corporate Real Estate Portfolio

Retrofit and new development standards

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Grosvenor Property UK

- Ambitious and progressive corporate biodiversity strategy
- Sets targets for exceedance of minimum standards for new development
- Plus gains across managed portfolio
- Viewed holistically to deliver co-benefits
- Exploration of how co-benefits can be leveraged

Our biodiversity strategy is based on four principles...

1

Exceeding best practice

Biodiversity net gains which exceed minimum best practice levels will be delivered through habitat enhancement, asset management interventions and a refreshed process for designing developments.

Gains will represent an increase in the quantity and quality of biodiverse habitats which benefit priority faunal species.

2

Functional ecosystems

We will respond to the climate emergency by creating multifunctional green assets and infrastructure, capable of delivering environmental co-benefits such as mitigating flood risk and reducing urban heat island effect.

3

Reconnection with nature

Our investments also aim to strengthen people's affinity with nature and provide wellbeing co-benefits.

Engagement and learning opportunities will be identified, and new development will integrate nature within the built form and bring wildlife into the community.

4

Maximising return on investment

To deliver the greatest impact across each principle, all investment decisions will be well-informed through an evidence based approach.

Strategy Overview

Our approach to enhancing biodiversity will deliver uplift through two main opportunities - improving the management of our existing biodiverse assets, and adding to these assets through new development and investment.

The London estate and Liverpool ONE represent our opportunity for biodiversity uplift through existing asset management. Through a review of existing green infrastructure, we have set realistic but challenging targets of 20% and 35% biodiversity net gain respectively.

For new developments and investments

- In urban areas, we will target significant biodiversity net gains in the developments of existing properties of 75% - 100%, moving to a 100% target gain by 2025
- Our Strategic Land business will target biodiversity net gains of 12 – 15%, stretching existing best practice planning requirements, moving to a 15% target by 2030
- New office and residential investments will be assessed on a case by case basis, with bespoke targets and action plans created

Business area		Uplift achieved through...	2030 Net Gain Target
London	Operations	Existing Asset Management	20%
	Locations		
	Mayfair / Belgravia development	Development	75-100%
UK Regions	Liverpool ONE	Existing Asset Management	35%
	Strategic Land	Development	12-15%
	Office/Residential	Development	Bespoke

Biodiversity Buffet

The Biodiversity Buffet is our guide for green assets and infrastructure, which can be used to identify and implement interventions for both new developments and existing assets.

Click here to read in full.

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Living roofs

Alongside benefits for biodiversity, living roofs contribute to Urban Heat Island (UHI) cooling, increase the energy efficiency of buildings and PVs when integrated alongside panels, store rainfall and slow flow rates, reducing surface water pooling at street level, create rooftop amenity space, and contribute to localised air quality improvement.

The concept is to create an interconnected rooftop network of stepping stones through an area, providing opportunities for the movement of invertebrates and birds roof-to-roof, and between roofs and ground level habitats.

Two types of living roofs should be considered for new schemes: extensive, substrate-based biodiverse roofs with low nutrient substrates ranging between ~120-200mm; and intensive green roofs with a minimum of 300-450mm of soil to support herbaceous, shrub, and tree planting.

Figure 11 Example substrate types and planting variation on biodiverse living roofs

Green Walls

Vertical greening should take the form of climbers/trellis systems. Modular systems can be costly and some require high water use. Climber/trellis systems can be cheaper however may take time to establish. Either system should use native species where possible that are of value for pollinators or herbivorous insects. Where possible these features should be installed to provide functional gains such as noise attenuation or air quality improvement.

Figure 1.6 Example Jackob Stainless Steel Trellis system (top) and MFO Zurich Park Hall (Image credits: Jackob (top) and Zuerich (bottom left))

Climbers/Trellis Systems

Design

The key elements which need to be considered in design are:

- Aspect - this influences watering requirement and species suitability. Commentary on suitability of aspect is provided in table 1.2 relating to species.
- Depth of growing medium in planters – sufficient depth should be provided allowing for root growth and water retention. Irrigation systems should be installed for periods of dry weather.
- Trellis type – tensioned wire systems should be favoured for their longevity and aesthetic appeal. These systems also tend to allow greater distance from the building, providing opportunities for wildlife and allowing easier maintenance and access to building facade.
- Intended height for growth – climbers will clearly take time to reach intended heights and coverage so areas subject to vertical greening should be realistic about the heights expected to be delivered by single plants. If significant heights are targeted, then subsequent suspended troughs could be provided up the trellis with additional climbing plants provided. The use of 'patterned' or aesthetically pleasing trellis systems could be considered so that aesthetic benefits are provided in the time taken for the climbers to reach maturity.
- Multiple species should be provided with identifiable ecological benefit for phytophagous or nectivorous invertebrates.

Installation

A specialist landscape suppliers should be contacted to support delivery of this feature.

Management and Monitoring

Climber/trellis system living walls should require limited management beyond upkeep of irrigation, standard weed control and management of spreading growth over windows/doorways. Specialist landscaping management companies should be used.

Trellises will need on-going maintenance to ensure they continue to provide uniform coverage, if for example, using species such as honeysuckle, clematis or Jasmine, these can become bare at the plant base and bushy at height. May need additional low level shrub layer.

Common name	Scientific name	Aspect
Common Ivy	Hedera helix	Full sun/partial shade/ full shade (South, East, North or West facing)
Clematis species	Clematis sp.	Full sun or partial shade (South, West or East facing)
Honeysuckle	Lonicera sp.	Full sun or partial shade South, West or East facing)
Star Jasmine	Trachelospermum jasminoides	Full sun or partial shade (South, West or East facing)

Table 1.2 Suitable species for trellis systems

Invertebrate Habitat

Loggeries

Stag beetle loggeries should be provided in landscaped areas in semi-shaded conditions.

Whilst stag beetle loggeries are not generally purchased as off-the-shelf products, they can be easily made using untreated native hard and soft woods.

A range of log sizes should be used from ~10cm up to ~40cm diameter. Approximately one third of the log should be buried in friable soils.

Plants such as ferns, bulbs and other woodland understorey plants can be planted amongst the loggeries in dappled sunshine.

Installation

Tbc based on site specific requirements. Specialist advice should be sought.

Management and monitoring

Maintenance is an often-overlooked aspect of artificial invertebrate nesting habitats. Bricks/ panels and features should be cleaned at the end of each summer where practical to do so.

Figure 1.9 Example stag beetle loggery in south London

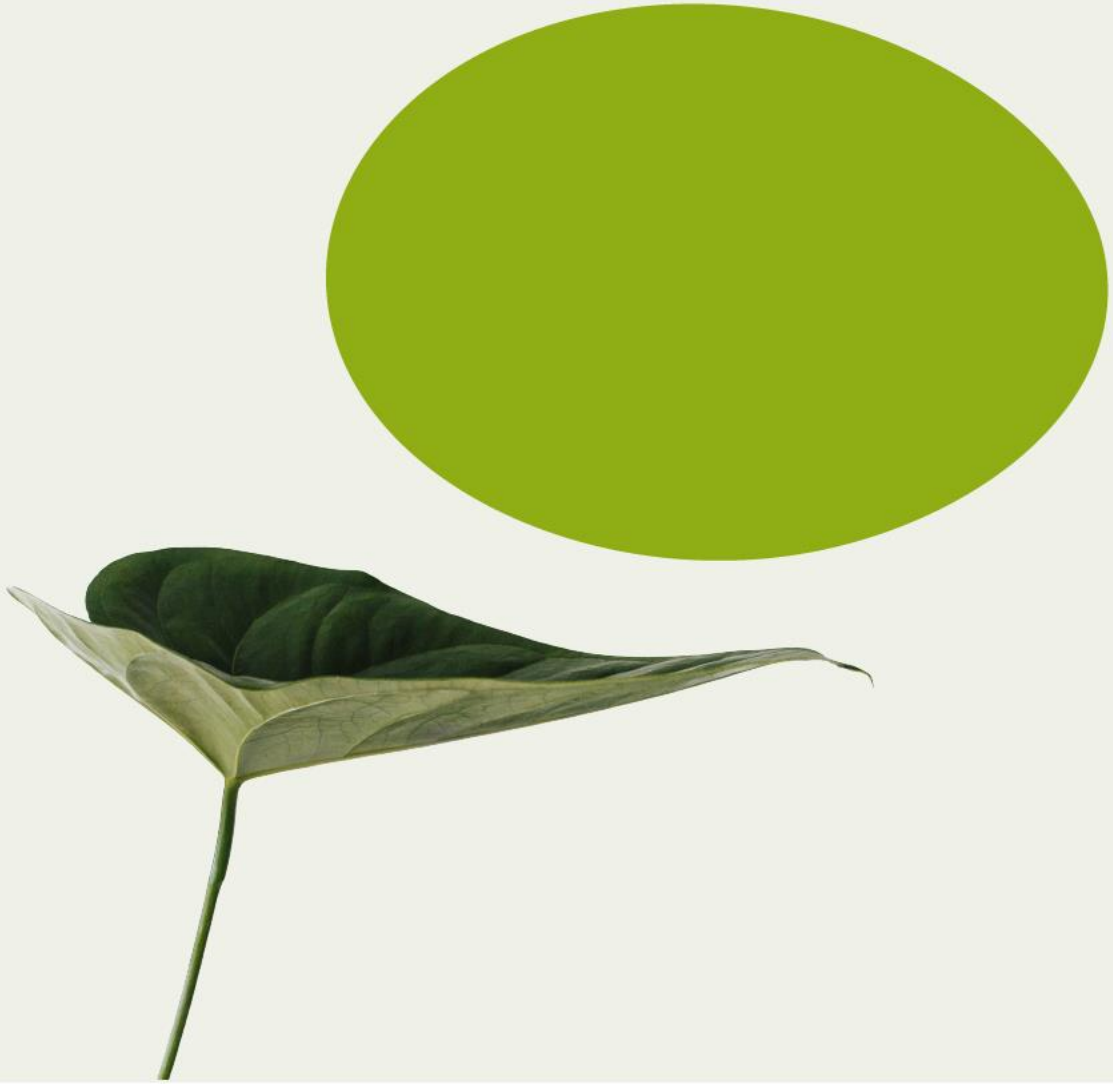
Bee Bricks and blocks

Where brick cavity walls are incorporated on sites, bee bricks should be included at a rate of 5 bricks per suitable façade or every 2m when overlooking a living roof. These should be focused in sunny, exposed areas on southern aspects at a minimum height of 1m. They should only be incorporated near soft landscaping areas to provide nectar sources within close proximity. Entrance holes should be unobstructed. Other bee brick, posts and nest boxes should be provided amongst landscaped areas, on roof terraces and on living roofs.

Figure 110 Bee brick, blocks posts and boxes to be embedded and or attached to walls/included in landscaped areas

Images missing

Leveraging the co-benefits of NbS



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ESG and other drivers

- Growing desire for biodiversity to be captured in ESG reporting
- Driven by investor expectations and emerging regulation
- Formalised drivers emerging, including TCFD and TNFD
- Tangible benefits also more widely understood – not just a PR exercise = functional improvement in asset performance
- Opportunity to leverage in novel ways – e.g. insurance benefits, utilities costs, green-linked finance
- So, deliver BNG, measure co-benefit, and leverage through ESG and novel financial mechanisms

3.1. QUANTIFYING THE BENEFITS

To further support the business case for investing in GI, there has been extensive work done to develop and enhance the evidence base for its wide-ranging benefits. The IGNITION Project collated thousands of pieces of academic and industry research into the benefits of GI to businesses, society, and the planet.[28] When focusing specifically on work environments, exposure to nature can result in reduced staff sick leave, reduced staff turnover, and an increase in worker productivity. Some insights taken from studies of incorporating nature into the workplace include:

- 15% increase in worker productivity when office spaces are enhanced with plants;[29]

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- 12% increase in reaction time when in the presence of plants;[30]
- Employees with views of trees and landscapes took an average of 11 hours less sick leave per year than employees with no view. This equates to an average saving of around £1,600 ($2,000 reported) per employee;[31]
- Workers with a view of nature handle calls 6-7% faster than those with no view. This generates annual productivity savings of around £2,400 ($2,990 reported) per employee;[32]
- 23% decrease in sick leave taken by employees with a view of nature.[33]

IGNITION have also produced a bespoke Green Roof Benefits Calculator that provides quantified estimations of the benefits provided by green roof delivery. Using building specifications from [redacted] the proposals for Options 1 and 2 outlined above, Greengage have used the Calculator to further articulate the business case for delivering a living roof. Some key benefits include:

- Energy savings: 6,154.11 kWh/year - 46,155.82 kWh/year;
- Energy cost savings: £1,015.43 - £7,615.71 per year;
- Avoided carbon emissions: 1,397.20 $kgCO_2e$/year - 10,478.98 $kgCO_2e$/year;
- Nitrogen dioxide sequestration: 232.20 $kgNO_2$/year - 378.40 $kgNO_2$/year;
- Property value uplift: 2.1% - 5.5%;
- Temperature regulation: 0.5°C - 1.5°C;
- Rainwater retention: 34% - 89% per year.

The full calculations for Option 1 and Option 2 are included in Appendix C and D, respectively.

	Normalised score on-site					
	Baseline	Post-development		100% suburban		
	Score	Average change/ha over 30 years	Change from baseline	Normalisation factor	Score	Change from baseline
Food production	0	0	1	2.40	0.01	0
Wood production	1	0	1	1.00	0.00	-1
Fish production	0	0	0	1.44	0.00	0
Water supply	6	2	4	1.20	0.30	-5
Flood regulation	4	1	2	1.52	0.12	-4
Erosion protection	3	1	3	1.93	0.04	-3
Water quality regulation	2	1	1	1.58	0.16	-2
Carbon storage	3	0	1	2.00	0.04	-3
Air quality regulation	4	0	1	1.20	0.03	-4
Cooling and shading	6	0	1	1.20	0.12	-6
Noise reduction	0	0	0	1.00	0.04	0
Pollination	5	1	2	1.33	0.16	-5
Pest control	9	0	1	1.10	0.20	-9
Recreation	15	1	2	1.44	0.15	-14
Aesthetic value	6	1	2	1.46	0.25	-6
Education	7	1	2	1.74	0.13	-7
Interaction with nature	4	1	1	1.94	0.15	-4
Sense of place	6	1	2	1.76	0.12	-6
Biodiversity units	0	10	10		3.54	4
Hedgerow units	0	2	2		0.00	0

Drivers for action

- The social housing provider
  - reduces opex
  - has happier, healthier residents
  - can explore marketable opportunity for carbon and biodiversity gains
- The corporate portfolio manager leverages ESG/TNFD disclosures for
  - reduced insurance premium
  - improved investor perception
  - green finance mechanisms
- The developer
  - eases through planning
  - gets higher market value for properties
  - All of the above

The key message

- If you have a Nature Positive strategy with outcomes framed in terms of ecosystem service co-benefit you will have embedded resilience to climate risk
- Metrics in ESG/TNFD disclosures can act as KPIs against which to hang lending mechanisms
- You can de-risk lending by de-risking asset performance and climate resilience
- Quantifiable, science-based and necessary to drive action

Any Questions?

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