Royal Botanic Gardens

Kew

Nature Unlocked: The Landscape Ecology Programme

Impact Report 2023/2024

Contents

Executive summary

The United Kingdom is facing a significant biodiversity crisis. A notable 20% decline in the biodiversity of flora, fauna and fungi in the UK since the 1970s – as evidenced by recent research undertaken by the 2023 State of Nature report – has resulted in the need for urgent conservation measures. In response to drastic changes in UK landscape ecology and the increase in related research, RBG Kew launched Nature Unlocked at Wakehurst in 2021: an innovative science programme, applied on a landscape scale, designed to address critical scientific gaps in UK biodiversity measurement and valuation.

High-impact, innovative science: Nature Unlocked utilises Wakehurst's expansive and diverse landscape as a living laboratory for advanced ecosystem research. Key scientific endeavours include ecosystem monitoring of climate and biodiversity changes across time and space, and research into the wider co-benefits of biodiverse habitats such as pollination services, nature connectedness and carbon storage and sequestration.

Collaborative approach: Nature Unlocked engages a wide range of stakeholders, including government agencies, academic institutions, industry partners and the public. This collaborative approach ensures that scientific findings are translated into actionable policies and practices that promote sustainable land management and biodiversity conservation.

Future directions: Looking ahead, Nature Unlocked aims to expand its scientific impact by establishing a Wakehurst Ecosystem Observatory at Wakehurst, which will provide long-term data on biodiversity, ecosystem dynamics and nature-based solutions to climate change. We will also scale up research initiatives to encompass broader UK landscapes, such as agricultural land. The programme also seeks to enhance public engagement through citizen science projects, educational programmes and immersive visitor experiences that promote a deeper understanding of nature and people's place within it.

Nature Unlocked: The Landscape Ecology Programme

The United Kingdom is currently grappling with a nature conservation crisis, evidenced by a substantial 20% decline in UK biodiversity since the 1970s, a figure outlined in the 2023 State of Nature report, produced by a collaboration of scientists from various sectors. In response, both the UK Government and international communities have initiated strategic measures such as the Environment Improvement Plan (EIP) and the Kunming-Montreal Global Biodiversity Framework (GBF). However, significant scientific gaps persist in measuring and valuing biodiversity across the UK, which poses an obstacle to the efficacy of conservation efforts.

To address this missing scientific data, RBG Kew launched Nature Unlocked, a pioneering landscape science programme designed to fill these gaps using an interdisciplinary and collaborative approach. This initiative harnesses Wakehurst's diverse landscape as a dynamic research platform, facilitating the collection and analysis of high-quality scientific ecosystem data. Through this endeavour, Wakehurst serves as a testbed for scientific discovery, with data evidencing and informing the efficacy of prevailing methodologies for valuing UK biodiversity.

Wakehurst's expansive 535-acre habitat-rich landscape creates a unique position for landscape-scale ecosystem research, encompassing a rich tapestry of habitats representative of the UK's ecological diversity. From ancient woodland to intensively managed areas like coppice woodland, the estate offers a comprehensive array of ecological contexts for monitoring and research.

Since its inception in 2021, Nature Unlocked has spearheaded interdisciplinary research efforts, amassing over two years' worth of invaluable data across various research strands. Supported by funding exceeding £4 million from public and private supporters, and with active engagement from key stakeholders including government entities, industry partners and Wakehurst's annual visitors, the programme has made substantial progress over the last three years.

From continuous carbon monitoring to studies on floral availability for pollinators, and from wellness studies engaging hundreds of visitors to published research on potential climate change mitigation, Nature Unlocked has undertaken comprehensive science research projects. Through this research, Nature Unlocked aims to influence land management policies and practices through a data-informed approach. This endeavour offers promise for government bodies, businesses, communities and landowners, providing effective nature-based solutions (NbS) to counteract historical and ongoing biodiversity loss, while offering pathways to address climate change and other environmental challenges facing the UK today and in the future.

Programme deliverables and outcomes

Over the last year, we have seen Nature Unlocked move from a pilot phase, with several critical science projects, to a programme with permanent monitoring infrastructure, interdisciplinary ecosystem projects, a designated team and a comprehensive plan for future research. At the end of 2023, Nature Unlocked was integrated into Kew's Science directorate as Initiative 4 in Kew Science's Priority 1: Ecosystem Services. With this organisational support, two new positions within the Nature Unlocked core team have been created and filled: Dr Phil Wilkes joined Kew as the Nature Unlocked research leader and Becca Roberts as the Nature Unlocked partnerships and policy senior officer.

RBG Kew Corporate Priority		**Nature Unlocked deliverable**
Deliver science-based knowledge and solutions to protect biodiversity and use natural resources sustainably	⟷	Deliver high-quality, innovative science to measure, define and monitor natural capital across Wakehurst and varied UK landscapes
Inspire people to protect the natural world	⟷	Inspire engagement, participation and learning through citizen science and public programmes, enhancing an understanding of and connection to nature
Train the next generation of experts	⟷	Train the next generation through interdisciplinary higher education programmes and internships focused on valuing and protecting UK biodiversity
Extend our reach	⟷	Share replicable protocols and best practice in land management for UK nature-based solutions and biodiversity across varied land uses and stakeholders
Influence national and international opinion and policy	⟷	Evidence policy and practice on nature-based solutions across UK and beyond

As we move into the second phase of Nature Unlocked, we emulate and aim to meet the following objectives, aligned to RBG Kew's Science Strategy:

Objective 1:

Deliver high-quality, innovative science to measure, define and monitor natural capital across Wakehurst and varied UK landscapes.

Objective 2:

Inspire engagement, participation and learning through citizen science and public programmes, enhancing an understanding of and connection to nature.

Objective 3:

Train the next generation through interdisciplinary higher education programmes and internships focused on valuing and protecting UK biodiversity.

Objective 4:

Share replicable protocols and best practice in land management for UK nature-based solutions and biodiversity across varied land uses and stakeholders.

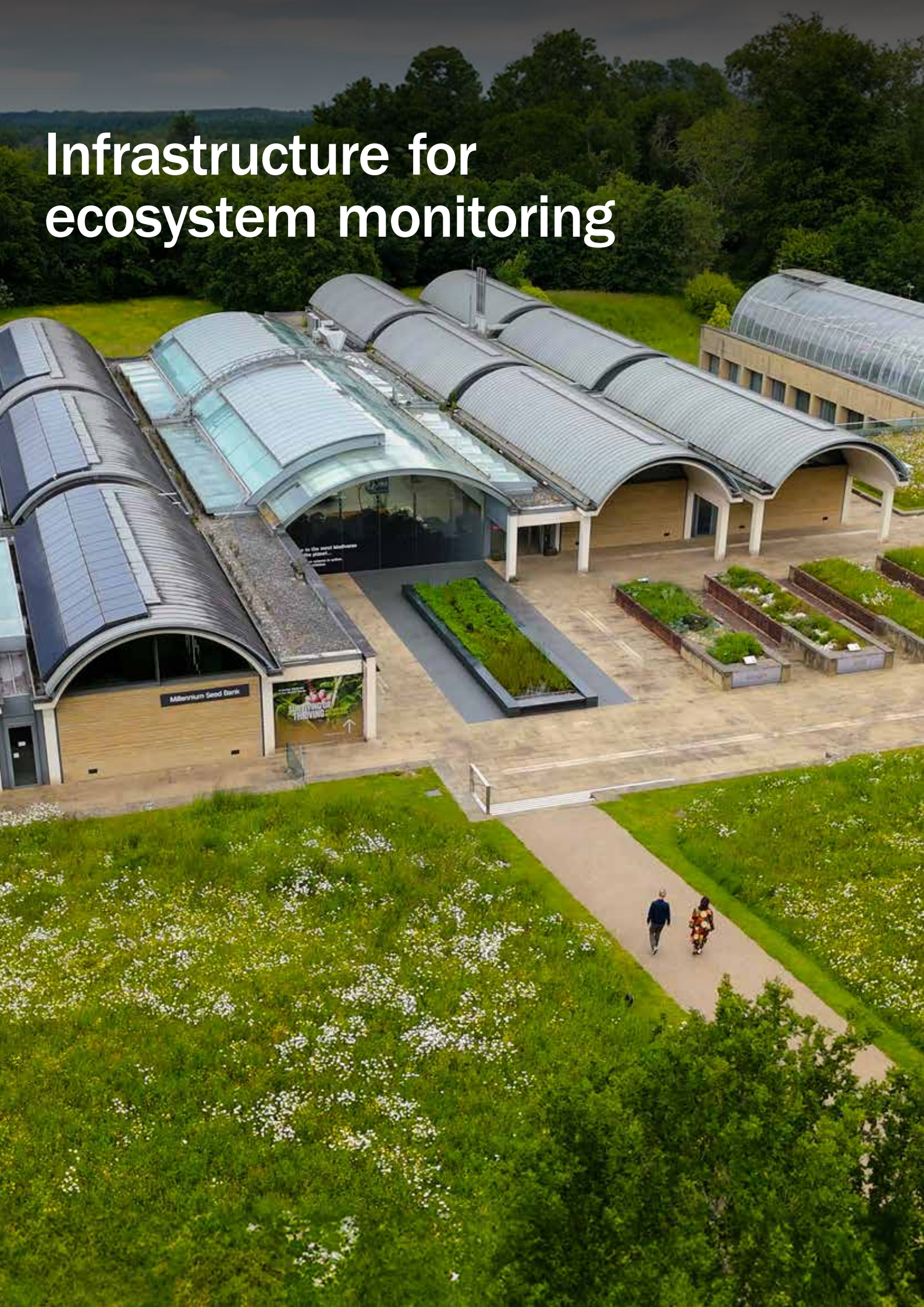
Objective 5:

Evidence policy and practice on nature-based solutions across the UK and beyond.

How do we measure the impact of Nature Unlocked?

Any impact made by Nature Unlocked will be thanks to a collaboration. At Wakehurst, impact includes Nature Unlocked being embedded as a core component of Wakehurst and Kew programming, from visitor events and learning curriculums to science strategy. Wakehurst will function as a living laboratory for advanced research on biodiversity and NbS, attracting academic partners and visitors to benefit from Wakehurst as a centre of conservation excellence. Our research helps Wakehurst to become carbon and nature positive and feeds into ecological horticulture design. Across the UK and beyond, Nature Unlocked quantifies the benefits of biodiversity for people, nature and climate and has long-term partnerships, especially with national and local government bodies to support nature recovery, access to nature and net zero targets. Wakehurst will be connected to other living laboratories across the UK and internationally, creating a high-resolution research network on multifunctional landscapes and NbS.

Infrastructure for ecosystem monitoring



In the last year, Nature Unlocked projects have become part of the very infrastructure of Wakehurst. This integrated approach contributes to the programme's aim for Wakehurst to become Kew's living laboratory. One aspect of this is the Wakehurst Ecosystem Observatory (WEO), a permanent plot network continuously monitoring ecosystem conditions through geography and time.

In it for the long term: Introducing the Wakehurst Ecosystem Observatory

An ecosystem observatory serves as a sophisticated monitoring facility intentionally positioned within natural landscapes. Equipped with an array of advanced instruments including cameras, sensors and data loggers, they function as permanent outposts, continuously capturing and analysing environmental data.

When installation is complete, the Wakehurst Ecosystem Observatory (WEO) will comprise 21 'plots' across Wakehurst's diverse habitats, monitoring biodiversity, microclimate, soil moisture, tree growth and changes in habitat structure. This data will be available to researchers conducting experiments in the landscape, and encourage collaboration with researchers outside of Kew.

WEO will play a crucial role in generating high-quality data needed for informed land use decisions, a need outlined in the Royal Society's 2023 report on multifunctional landscapes. Through advanced data analysis, the Nature Unlocked team can examine this diverse dataset and offer decision-makers a consistent, science-based foundation for planning.

Research opportunities at Wakehurst: Empowering scientific discovery

Research at Wakehurst has been led by our Nature Unlocked scientists, but through WEO, the landscape is now open to outside researchers interested in conducting experiments onsite. By calling for outside expertise, we aim to gather a greater breadth of ecologically relevant data that reveals the multiple co-benefits of diverse habitats.

CASE STUDY:
Beneath the bark: Insights from tree probes

Using Wakehurst as one of five testing sites, the Met Office's Climate and Plant Biosecurity Climate Service has developed a new model to understand how pests and pathogens respond to different microclimates. The model estimates temperature and humidity under tree canopies and inside tree trunks, where microclimates differ from the data collected by traditional weather stations.

Microclimate sensors have been installed at Wakehurst by the Nature Unlocked team in partnership with the Department for Environment, Food and Rural Affairs (Defra), the University of Exeter and Forest Research. This research will contribute to creating a tool that forecasts the timing and location of pest outbreaks throughout the UK.

High-impact, innovative science

Research in the Nature Unlocked programme highlights ecosystem science from multiple, integrated angles, from seed germination in south-east England to giant sequoia growth dynamics across UK sites. Through advanced techniques like terrestrial laser scanning and experimental bee banks, Wakehurst researchers are advancing sustainable biodiversity conservation and climate resilience efforts.

Publishing research at Wakehurst

1. Understanding how climate change will impact seed germination

In 2023, a paper was published in *Plants, People, Planet* on a Nature Unlocked project that investigated how changing weather patterns are impacting the germination of native plant seeds at Wakehurst as a case study for the south-east of England. Leading researcher Dr Efisio Mattana, in collaboration with Kew's Millennium Seed Bank (MSB) team and a researcher from the University of Pisa, Italy, found that these shifts pose significant risks to species that play vital roles in local ecosystems. Findings from this study underscore the need for climate-smart strategies to restore and protect these plants in the face of changing climates, ensuring they continue to provide essential benefits to our ecosystems and communities.

Using advanced germination modelling and using seed lots and data from Kew's MSB, this study emphasises the importance of seed lots stored in conservation seed banks in adapting conservation efforts to climate change. This approach not only guides immediate conservation actions but also sets a blueprint for addressing similar challenges in other regions affected by climate variability.

2. Giant redwoods in the UK

As part of a study published in early 2024, Nature Unlocked scientists used terrestrial laser scanning (TLS) to estimate the volume, biomass and biomass accumulation rates of giant sequoias (*Sequoiadendron giganteum*) at three UK sites. The study revealed significant growth variations among the sites – Wakehurst, Benmore and Havering – due to factors like climate, soil conditions and tree management. Read the article for further information about the work carried out by our Nature Unlocked scientists.

Understanding these growth patterns is crucial for future tree-planting decisions. The study emphasised the importance of considering local environmental conditions to ensure the successful growth and carbon sequestration potential of giant sequoias.

This message was well received by the press and had a significant impact, with coverage on BBC Radio 4 and World Service, Sky News, CBS and more. The story was syndicated across over 100 local press outlets and multiple BBC local radio stations, resulting in just under 800 million opportunities to access the story across print, broadcast and online outlets.

Nature Returns: Carbon and biodiversity research at Wakehurst

The goal of the Nature Returns programme (formerly Nature-based Solutions for Climate Change at the Landscape Scale) is to build evidence to support decision-making by policymakers, land managers and investors. Project-managed by Natural England, the programme is co-sponsored by Defra and the Department for Energy Security and Net Zero (DESNZ), with funding from HM Treasury's Shared Outcomes Fund and Defra's Net Zero Research and Development budget. Research at Wakehurst focuses on understanding the ecological processes that control carbon balance in multiple habitats. Launched in 2021, the programme was initially funded for three years but has been extended for an additional year, until March 2025.

Over the past three years, scientists at Wakehurst have collected extensive carbon and biodiversity data. This data includes above-ground and below-ground samples and carbon fluxes from various habitats at Wakehurst, as well as hedgerow samples taken across the south-east of England. The aim of our research is to understand the processes of carbon capture, storage and release, and to examine how carbon levels and biodiversity change over time and through space. We have developed methods to calculate carbon at different scales, from individual trees to entire habitats, for both above- and below-ground carbon.

Our team compares existing allometric algorithms for estimating carbon and biomass in trees against our detailed on-the-ground measurements. By mapping the correlations between carbon levels and variables such as land use, tree height, soil texture and pH, we are improving our landscape modelling tools to aid in UK-wide landscape-scale decision-making.

Constructing the UK's first experimental bee banks

Constructed both in the visitor-accessible gardens and in wider Wakehurst, bee banks act as vital living laboratories, allowing us to study bee health, behaviour and resilience amidst environmental challenges such as climate change and habitat degradation. We hope to gain valuable insights into the impacts of pesticides, diseases and climatic variability on bee populations, informing evidence-based conservation strategies. Beyond research, our bee banks have played a crucial role in public engagement, providing educational opportunities for visitors and fostering community awareness about the essential role pollinators play in sustaining natural ecosystems.

To scale up this science, we hope to test the viability of bee banks as a nature-based solution for encouraging ground nesting bees in urban environments. Last year, Nature Unlocked scientists conducted habitat surveys at Mount Anvil's five urban developments, including establishing a baseline of abundance and richness of pollinators in the area and creating a 'Biodiversity Blueprint' for measuring biodiversity onsite. Bee banks have the potential to be an urban landscape design feature that promotes pollinator diversity in a small space, and trials at Wakehurst could impact implementation across the UK.

Wakehurst visitors participate in Noticing Nature

Through the Nature Unlocked programme, we want to understand not only the ecological role biodiversity plays in habitat function, but also the value biodiversity has in promoting human wellness. Part of Year 4 of our partnership with Sky, this research adds to previous nature connectedness studies conducted at Wakehurst. Bringing together media, science and community engagement expertise, Wakehurst's biodiverse landscape acts as a platform for testing a digital-based approach to a unique space to understand human connection to nature.

In 2023, the Noticing Nature research study was launched, including the development of the bespoke Noticing Nature app that allows Wakehurst visitors to document their wellbeing and take photos of their environment while exploring the landscape. This study aims to develop and test a digital-based approach to nature engagement, further exploring what makes people connect with nature and go on to make positive impact in their landscapes and communities. The trial of the study in the autumn engaged over 30 members of the public and went on to recruit a further 300 visitors during the summer.

Connection to nature

Wakehurst is at the forefront of biodiversity conservation and scientific engagement, employing advanced research techniques and fostering public participation in environmental stewardship and sustainable practices through higher education programmes, training the next generation of ecosystem scientists, citizen science and onsite interpretation.

Citizen science: Trees for Bees

The Trees for Bees project was developed in 2023, and aims to identify which bees frequent which trees, to better understand the best trees and woody plants for supporting a diverse range of pollinators. Likened to 360-degree meadows, trees are efficient in cultivating urban biodiversity; they take up less space than a meadow but still provide a significant resource. By analysing the pollen carried by bees, Nature Unlocked scientists can gain information about how bees behave throughout the season.

To add to the data collected by Nature Unlocked scientists, a Trees for Bees citizen science project was developed in the summer of 2023 to incorporate observations made by Wakehurst visitors. This observational data will aid our scientists in understanding how pollinators forage throughout the season and the project has engaged our visitors to become part of our science team.

For more information, **see kew.org/wakehurst/nature-unlocked/trees-for-bees**

Wakehurst Data Recording Day

In May 2024, we conducted the inaugural Wakehurst Data Recording Day, popularly referred to as a Bioblitz. We were joined by local recording groups, including Sussex Biodiversity Records Centre and the Wildflower Conservation Society, to record biodiversity data. A Bioblitz involves identifying and cataloguing as many species as possible within a specific area over a short period, typically 24 hours. The aim of this event was to establish a comprehensive baseline of the biodiversity at Wakehurst, encompassing plants, animals, fungi and other organisms.

Looking ahead, our ambitious goal is to conduct Bioblitz events biannually across multiple habitats at Wakehurst. This will allow us to monitor the biodiversity at Wakehurst and observe how it may change over time.

CASE STUDY: Interpretation in the landscape

Interpretation is used to help visitors engage with the science stories and outputs of Nature Unlocked. That engagement begins in the Visitor Centre with a modular display explaining the Trees for Bees research and inviting visitors to pick up a leaflet and get involved. A ramble in the garden can turn into a contribution to active and valuable research, helping to move visitors along that spectrum from passive consumer to active champions for nature.

The bee bank in the Children's and Community Garden overturns the notion of bees as something to fear. New interactive panels explore the lives of tunnelling bees, with ropes that illustrate how deep bees tunnel. The interpretation also platforms Wakehurst's pioneering claim: that this is the first bee bank of its kind – a live experiment and a draw to scientists and enthusiasts to find out more about these pollinators.

Evidencing and influencing policy

To engage a wider audience, we use onsite science to communicate with government stakeholders, demonstrating the practical applications and benefits of ecosystem research first-hand. These visits enhance understanding and facilitate discussions that inform policy and funding decisions.

***In situ* science: Showcasing the Wakehurst landscape**

Explaining science onsite to government stakeholders has proven to be a transformative approach in influencing UK policy and practice. From 2023 to 2024, we welcomed over ten government groups to Wakehurst, including policy and research teams from Defra, HM Treasury and the Environmental Audit Committee. By bringing stakeholders to Wakehurst, we provide an immersive experience that demonstrates the practical application and benefits of ecosystem research. These onsite visits have significantly enhanced stakeholders' understanding and engagement, making complex scientific concepts more tangible and compelling.

Close collaboration with Defra and parliamentary groups further strengthens partnerships and aligns Nature Unlocked with governmental priorities, fostering effective environmental stewardship and influencing evidence-based decisions that promote resilience and conservation in the UK's natural ecosystems.

Evidencing carbon and biodiversity policy

1. Publishing the Nature Returns interim programme

In May 2024, an interim report was published as part of the Nature Returns Programme, a Natural England-led cross-government project aimed at building evidence for nature-based solutions to climate change and biodiversity loss. Wakehurst has been the site for Kew's carbon and biodiversity research, investigating carbon storage processes and developing methods to scale up information. Kew scientists have collaborated with Natural England scientists to develop and ensure method alignment across the six Nature Returns wider pilot sites, including above-ground carbon research on hedgerows and greenhouse gas flux research. This progress highlights the successful collaboration between scientists, land managers, green finance experts and local communities.

2. Contributing to Defra's Terrestrial Natural Capital Ecosystem Assessment programme

As part of the carbon research, Nature Unlocked researchers participate in Defra's Natural Capital and Ecosystem Assessment (NCEA) programme, focusing on England's terrestrial environments (tNCEA). Within tNCEA, Kew investigates the role of mycorrhizal fungi in soil health and carbon sequestration. These fungi form symbiotic relationships with plant roots, enhancing nutrient uptake and contributing significantly to soil carbon stocks. Despite limited knowledge of the diversity and distribution of mycorrhizal fungi in the UK, Kew is collaborating with Natural England and Forest Research to integrate mycorrhizal research into national soil monitoring, informing soil health assessments, land management and conservation policies.

Since October 2022, Kew's research team has processed numerous soil samples to classify mycorrhizal roots, advancing tNCEA's soil monitoring capabilities. See more information on the Natural Capital and Ecosystem Assessment Programme (Mycorrhizas) page on kew.org.

Early insights include:

- Figure 1: Over 200 existing and new mycorrhizal species identified during below ground investigations at Wakehurst. Despite rigorous environmental assessments, this work has highlighted the key areas where further research is required to unlock future nature-based solutions, at a landscape scale.
- Figure 2: Below-ground carbon stock is comparable in different habitats at Wakehurst, despite wildly varying ecosystem compositions.
- Figure 3: Continuous gas flux monitoring helps create a baseline for carbon when combined with above- and below-ground methods.

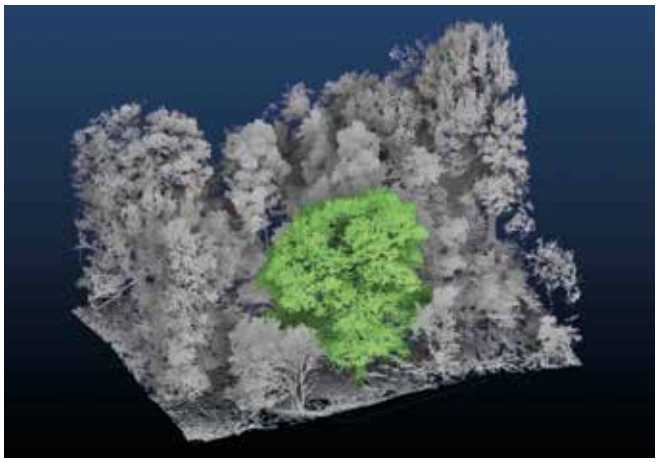


Figure 1: LiDAR scan of broadleaf woodland plot, tree highlighted in green is segmented for further analysis.

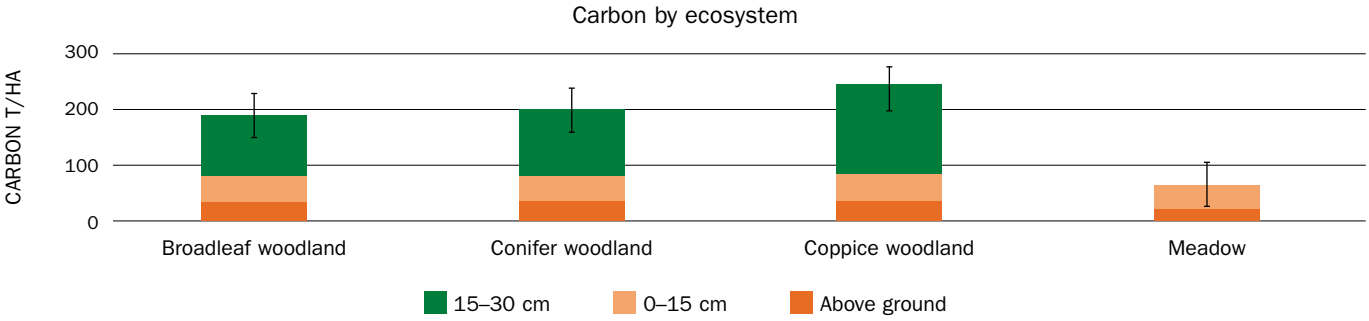


Figure 2: Carbon stock by habitat at Wakehurst, above ground (green) and below ground (dark and light orange).

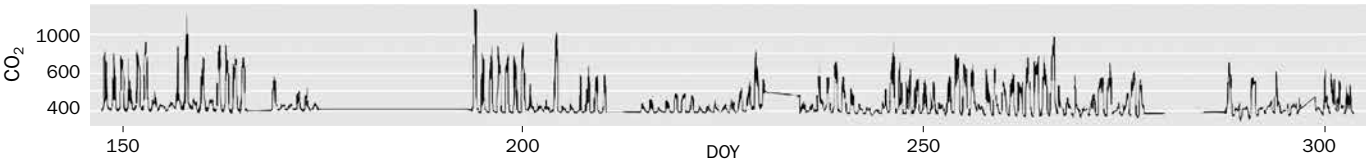


Figure 3: Continuous CO_2 flux respiration measurements from one hub (of four) in the meadow habitat, showing the variation across the day and months (6 months of data).

3. Wakehurst's carbon research and the British Standards Institute (BSI)

The impact of Nature Unlocked continues to expand through our collaborative efforts. In March 2023, Defra's Green Finance team announced a partnership with the British Standards Institute (BSI) aimed at creating a UK-wide standards framework to enhance efficiency, clarity and thoroughness in nature investment and management.

Dr Justin Moat, initiative lead and senior Spatial Analysis research leader, sat on the advisory board for development of the BSI's 'Flex 701 Nature Markets – Overarching Principles and Framework', and Nature Unlocked will be represented in the upcoming 'Flex 703 Supply of Natural Carbon Benefits' advisory group. The publications resulting from these advisory groups are part of Nature Investments Standards Programme, a collaborative initiative between Defra, the devolved administrations and the industry, which aims to create high-integrity guidance on carbon and nature investments for the UK.

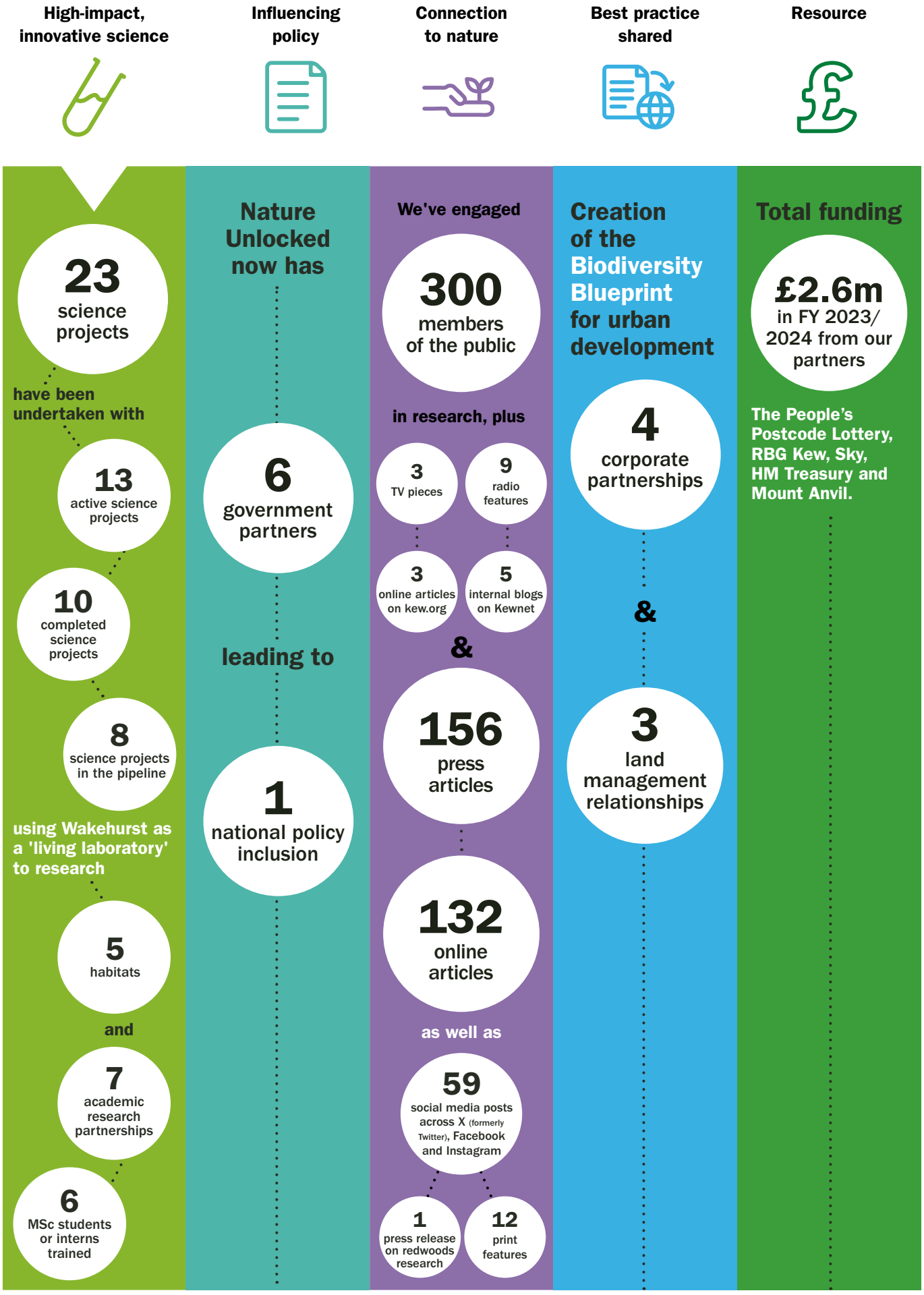
A year in review 2023/2024

May 2023 marked two years since the launch of Nature Unlocked. The following year built on our current impact, reflecting the challenges required to grow further. We need our research to be applied beyond Wakehurst's boundaries; integrated into Wakehurst's public programmes; aligned purposefully to relevant government policy; onnnected with more corporate partners and funded long-term for interdisciplinary research on the value of UK biodiversity.

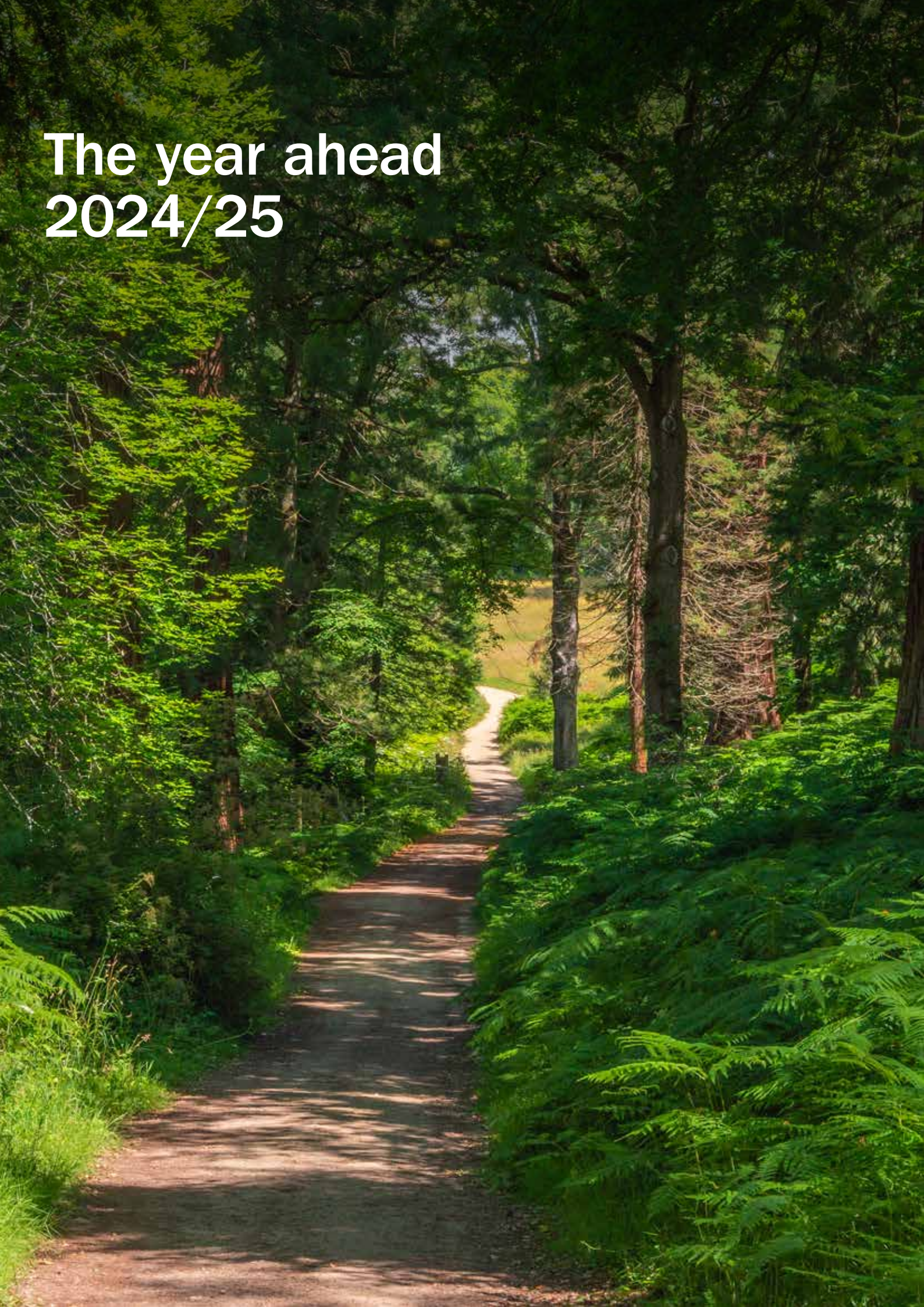
Quarter	Activities
Q1 (April – June)	• Publication of our 10 Principles for Investing in Nature for net zero, with the aim of informing best business practice (April 2023). • Start of Year 4 of the Sky/Kew partnership, supporting mycology and carbon research and trialling digital approaches to nature connectedness. • Recruitment of a philosophy research assistant at Wakehurst, who investigates people's approach to environmental stewardship and nature connection (April – July 2023). • Recruitment of a Nature Unlocked research leader as a joint post with University of Cambridge. • Start of MSc project collecting carbon and pollination baselines of the Asian Heath Garden at Wakehurst, exploring how horticultural approaches influence ecosystem services (February – June 2023). • Publication of a peer-reviewed paper on UK native seed germination thresholds to climate change. • Visit to Wakehurst from the House of Commons Environmental Audit and Science, Innovation and Technology select committees.
Q2 (July – September)	• Completion of Natural England's first season of carbon data on the six wider UK pilot sites as part of Nature Returns. • Start of summer pollinator research across Wakehurst's treescapes and in London property developments, in collaboration with Mount Anvil and Peabody. • Development of Trees for Bees citizen science project. • Launch of visitor recruitment for the Noticing Nature Sky-funded nature connectedness research project. • Visit to Wakehurst from Defra Minister for Food, Farming and Fisheries, Mark Spencer. • Content refresh for Nature Unlocked, with a new webpage created and social media videos produced.

Quarter	Activities
Q3 (October – December)	• Formal incorporation of Nature Unlocked into Kew Science as a Priority 1 Initiative. • Continued analysis of carbon and biodiversity research at Wakehurst and exploration of the use of a landscape modelling tool with local stakeholders/land managers. • Installation of wet woodlands greenhouse gas flux sensor, monitored in the landscape by a PhD student from Royal Holloway with the help of our gas flux team. • Nature Unlocked research featured at the Chatham House climate change conference. • Visit to Wakehurst from David Hill (Director-General Environment Rural and Marine) and Defra senior team.
Q4 (January – March)	• Completion of year 3 of the Nature Returns nature-based solutions research programme, led by Natural England. Interim report can be found here. • Start of recruitment for second phase of Noticing Nature nature connectedness research study. • Nature Unlocked science stand at the 'Roadmap to 2030' COP event held at Kew. • Bee bank construction completed, with two banks created in the Wakehurst landscape. • National press release on redwoods and carbon storage. • Presentation of Nature Unlocked to the Foreign, Commonwealth and Development Office (FCDO).

A year in numbers 2023/2024


High-impact, innovative science
Influencing policy
Connection to nature
Best practice shared
Resource
23
science projects
have been undertaken with
13
active science projects
10
completed science projects
8
science projects in the pipeline
using Wakehurst as a 'living laboratory' to research
5
habitats
and
7
academic research partnerships
6
MSc students or interns trained
Nature Unlocked now has
6
government partners
leading to
1
national policy inclusion
We've engaged
300
members of the public
in research, plus
3
TV pieces
9
radio features
3
online articles on kew.org
5
internal blogs on Kewnet
&
156
press articles
132
online articles
as well as
59
social media posts across X (formerly Twitter), Facebook and Instagram
1
press release on redwoods research
12
print features
Creation of the Biodiversity Blueprint for urban development
4
corporate partnerships
&
3
land management relationships
Total funding
£2.6m
in FY 2023/ 2024 from our partners
The People's Postcode Lottery, RBG Kew, Sky, HM Treasury and Mount Anvil.

The year ahead 2024/25



May 2024 marked three years since the launch of Nature Unlocked. The next year will embrace the exciting growth the programme has experienced in the last year, aiming to further integrate our science projects and expand the research being done onsite at Wakehurst. We need this research to be applied beyond Wakehurst's boundaries; further integrated into Wakehurst's public programmes; aligned purposefully to relevant government policy; connnected with more corporate partners and funded long-term for interdisciplinary research on the value of UK biodiversity.

Quarter	Activities
Q1 (April – June)	• Recruitment of a Nature Unlocked partnerships and policy senior officer. • Continuation of Noticing Nature nature connectedness research at Wakehurst, in collaboration with Sky. • Start of Year 4 of the Nature Returns Programme, extended by a further year to March 2025. • Nature Unlocked Wakehurst Ecosystem Observatory open day attended by 50+ scientists from 20 organisations.
Q2 (July – September)	• Second year of data collection of summer pollinator research across Wakehurst's treescapes and in London property developments, in collaboration with Mount Anvil and Peabody. • Continued development of citizen science plans across workstreams. • Recruitment of 50+ visitors to participate in the Trees for Bees citizen science project. • Pilot project on the impact of increasing temperatures (including heatwaves) on pollination and seed germination of native species and their implications on genetic diversity. • New film and photography content for summer drone campaign.
Q3 (October – December)	• Publication of Nature Unlocked Phase II strategy. • Submission of results from ongoing pollination research and nature connectedness studies for publication. • Landscape interpretation for active science projects, including interpretation applied to WEO plot installation.
Q4 (January – March)	• Completion of Nature Returns carbon and biodiversity research programme (March 2025). • Publication of peer-reviewed papers and reports. • Publication of methods and lessons learned from the four-year Nature Returns Programme.

Meet the Nature Unlocked Team

Core Team

Dr Justin Moat
Nature Unlocked initiative lead and senior research leader, Spatial Analysis

Dr Phil Wilkes
Nature Unlocked research leader

Rebecca Roberts
Nature Unlocked partnerships and policy senior officer

Libby Howell
Nature Unlocked programme officer

Lyndsay Fowks
Nature Unlocked programme officer (maternity)

Pollination

Dr Phil Stevenson
Priority lead

Dr Janine Griffiths-Lee
Post-doctoral researcher

Nature Connectedness

Lorraine Lecourtois
Head of Public Programmes, Nature Connectedness lead

Seed Germination Ecology

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Citizen Science

Eliana Van-der-Schraft

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Jess Hayne

Marilena Reina

Charlotte Magowan

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Spatial Analysis
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Spatial Analysis
Gui Castro
Research assistant

Spatial Analysis
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Spatial Analysis
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Mycology
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Senior research leader

Mycology
Dr Jill Kowal
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Mycology
Dr Jim Clarkson

Mycology
Ben Underwood

Gas flux
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Mycology
Dr Martin Bidartondo

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