

Credit: Paul Salaman



# Tiny Forest

Monitoring Report 2023



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# INTRODUCTION

A Tiny Forest is a dense, fast-growing woodland planted with a diverse mix of native trees and shrubs, typically the size of a tennis court. These mini forests are planted in urban areas to bring more nature to people's doorsteps. Tiny Forests use the Miyawaki tree planting method, where the soil is prepared and a diverse community of native trees that include the different layers found in a mature forest, are planted close together.

Using Tiny Forests as a network of living laboratories, we are working with communities to monitor and understand the environmental and social benefits that Tiny Forests provide in urban areas, across different geographical areas and demographics.

Taking part in Tiny Forest citizen science is an opportunity to build social cohesion, re-connect people to nature, raise environmental awareness and empower positive action. Results will deepen our understanding of how the Miyawaki method allows our Tiny Forests to develop rapidly into a multi-layered forest ecosystem.

Here we showcase the five key topics we are exploring across Tiny Forests in the UK, Netherlands and Ireland: biodiversity, tree growth and carbon storage, flood management, thermal comfort and social benefits.



Results presented here show how the environmental and social impacts vary across different forests and how they change as forests develop.

**A huge thank you to all the citizen scientists, Tree Keepers, volunteers and partners without whom this report would simply not be possible!**







## How do Tiny Forests contribute to urban biodiversity?

Urban greenspaces are crucial to providing homes for wildlife in our towns and cities. Sensitive managed habitat creation and conservation in our green spaces provides nesting habitats, shelter, food and connectivity for the movement of species across the built environment.

This is increasingly important in light of declines in nature revealed in the [State of Nature Report 2023](#). The report highlights declines in invertebrate groups, notably in groups we are monitoring in Tiny Forest surveys. Pollinators including bees, hoverflies and moths were found in 18% fewer places, while insects, spiders and millipedes in 13% fewer places than in 1970. Tiny Forest features as a case study in the report highlighting the importance even small spaces have in urban ecosystem restoration.

So, it is even more important that we understand how Tiny Forests contribute to restoring habitat for these mighty mini-beasts, which play an integral role in ecosystem function.

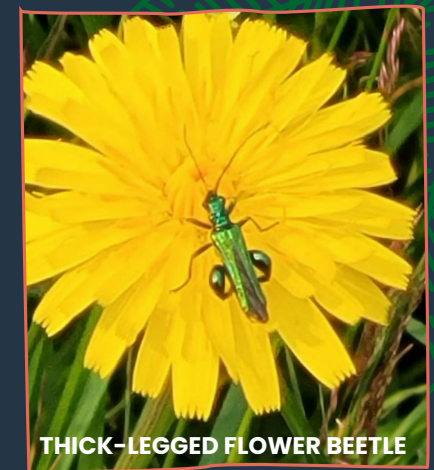
*'Just some of the wildlife that has found shelter in Flamboyant Tiny Forest! It's only our first summer and already the trees have grown wonderfully and there's many insects and beetles so improve the biodiversity and provide food for the nesting birds.'*

**- Neve Hughes, Tree Keeper, Flamboyant Tiny Forest**

Photos credit: Tree Keeper Neve Hughes, Flamboyant Tiny Forest, Hope Coppice, Solihull.



**BUFF-TAILED BUMBLEBEE**



**THICK-LEGGED FLOWER BEETLE**



**CUCUMBER SPIDER**



**GROUND BEETLE**



**WELSH CHAFER**



**NODDING THISTLE RECEPTACLE WEEVIL**



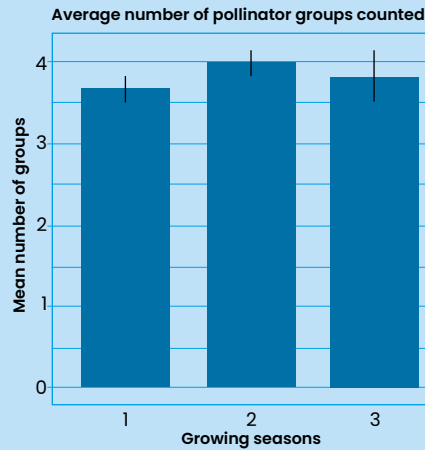
# Biodiversity



Total number of mindful minutes volunteers spent observing biodiversity = **12,057!**



**COMMON BLUE, GREEN-VEINED WHITE, BRIMSTONE, SKIPPER, COMMA AND PAINTED LADY BUTTERFLIES** (each found in 5% of TFs)



**SMALL INSECTS**  
(less than 3mm)

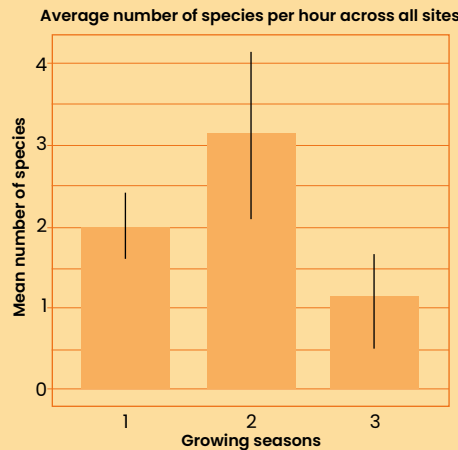


**59** Tiny Forests  
**171** Surveys

**OTHER FLIES**



**POLLINATOR DIVERSITY SHOWS NO CHANGE AS TINY FORESTS GROW**



**BUTTERFLY DIVERSITY IS HIGHEST IN TINY FORESTS IN THEIR 2ND GROWING SEASON**

**38** Tiny Forests  
**162** Surveys



**ANTS**



**WOODLICE**



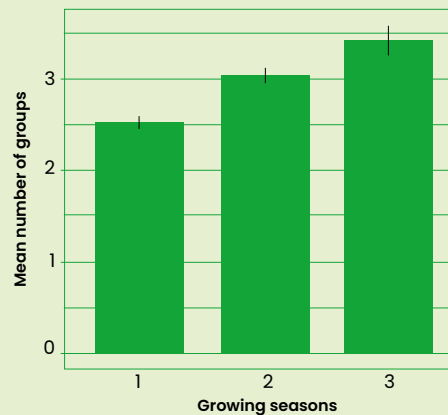
**SNAILS AND SLUGS**



**OTHER SPECIES REPORTED FROM TINY FORESTS:**

toads, frogs, spiders, dragonflies, crickets, newts, foxes, common blue damsel fly, giant bush cricket, mice, dock bugs

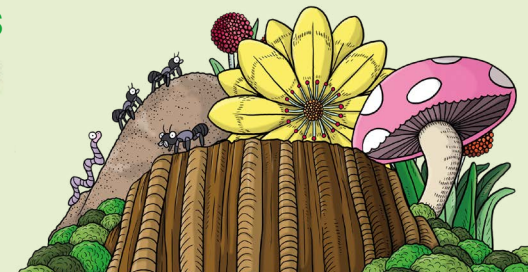
Average number of groups per Tiny Forest across all sites



**GROUND DWELLER DIVERSITY INCREASES AS TINY FORESTS GROW**



**84** Tiny Forests  
**559** Surveys





# Biodiversity

## RESEARCH AMBITION:

How do forest features (such as age, tree species, soil) affect invertebrate communities over time? How does surrounding greenspace affect species recorded in the Tiny Forest?

**BUTTERFLIES** were surveyed in 38 Tiny Forests in 2023. In total, citizen scientists completed 162 surveys (counts and species lists) recording nearly 250 individual butterflies. Top species recorded were Small White and Large White – recorded in 22% and 19% of Tiny Forests respectively. While still a commonly seen species nationally, they have seen a decline in distribution in the UK between 2012–2022<sup>1</sup>

A range of other species were recorded in small numbers across forests, this may be because surveys are carried out over a number of months meaning different species are spotted depending on their activity at that time of year. Among the less common butterflies counted you recorded brightly coloured Common Blue, Green-veined white, Brimstone, Skipper species, Comma and Painted Lady butterflies which were each found in 5% of Tiny Forests.



Small White butterfly

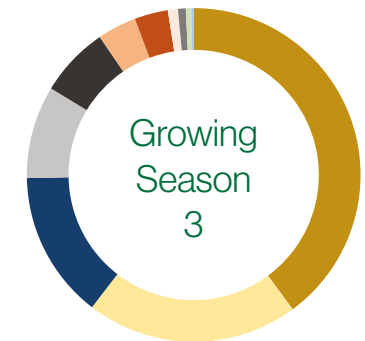
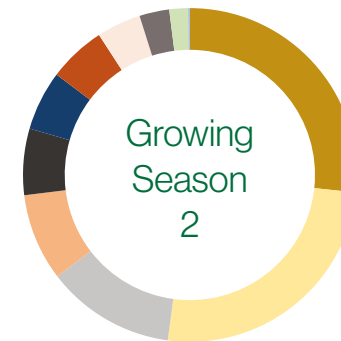


Large White butterfly

**GROUND DWELLING** invertebrates were surveyed in 82 Tiny Forests in 2023. When a Tiny Forest is planted, biodiversity tiles are installed which can be lifted up carefully to record the invertebrates living underneath – 549 biodiversity tile surveys were submitted this year. Results are calculated from an average count across all tiles in each forest surveyed.

In 2023, ants made up 72% of invertebrates counted and were present in 60% of forests, closely followed by spiders which were found in 57% of forests. When ants are excluded from the data, woodlice, snails & slugs make up 50% of invertebrates counted.

The diversity of species groups increases and changes (see below) as Tiny Forest's grow – with more woodlice, snails and slugs and ground beetles found in three-year-old forests.



- Woodlice
- Snails and slugs
- Ground Beetles
- Other
- Spiders
- Centipedes
- Earthworm - surface-feeding
- Earthworm - Soil-feeding
- Millipedes
- Earwigs
- Beetles

1. <https://butterfly-conservation.org/sites/default/files/2023-01/State%20of%20UK%20Butterflies%202022%20Report.pdf>



**POLLINATORS** Our citizen scientists have surveyed pollinating insects in 59 Tiny Forests in 2023 completing 171 surveys – spending a total of 1,710 mindful minutes observing the busy comings and goings of over 3,000 individual pollinators including flies, bees, hoverflies and beetles.

Other flies and small insects were most abundant making up 40% of all insects counted. This is consistent with findings from the UK Pollinator Monitoring Scheme FIT count results from 2022<sup>1</sup>. This is an indication of the diversity of creatures in our urban habitats, with these “less charismatic” species playing a substantial role, when compared to bumblebees and butterflies that we might automatically think of when we talk about pollinators.

The average number of pollinator groups recorded per FIT count remains relatively stable as the forests grow, providing essential resources for pollinators early and late in the season.



1. <https://ukpoms.org.uk/sites/default/files/pdf/PoMS-AR-2022-EN-Final.pdf>

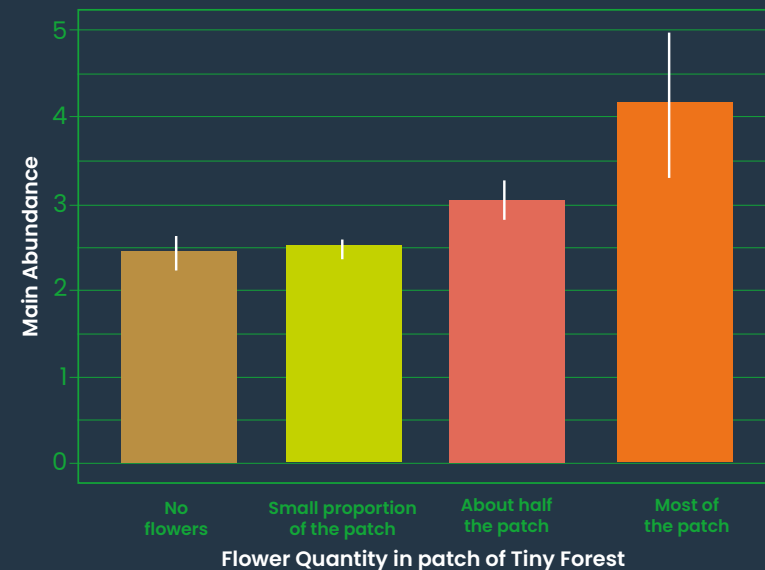
# CITIZEN SCIENCE CURIOSITY CHALLENGE:

Make your biodiversity surveys one of “A Million Acts of Science”

The best time to carry out butterfly and pollinator surveys in your local Tiny Forest is April and May when flower resources are likely to be at their peak when most species are active. As you can see in the graph (below), surveys in patches with most flowers record the highest abundance of pollinators. Each year, we run the Tiny Forest Wildlife Count in May, encouraging as many people as possible to get out and enjoy their local Tiny Forest while providing critical data about how the diversity and number of species of pollinators change in a Tiny Forest. If you focus your surveys on tree species like hawthorn, willows, crab apple, rowan, cherries which are likely to be in flower in April and May, you’ll be amazed how busy they are.

## One Million Acts of Science

In 2024, April is Citizen Science Month. This month promotes participation in citizen science and this year the challenge is to collectively generate over one million data points to featured projects, including Tiny Forest.



**MORE POLLINATORS ARE RECORDED WHEN A  
SURVEY PATCH HAS MORE FLOWERS**



# How do Tiny Forests effect flood management compared to the surrounding area?

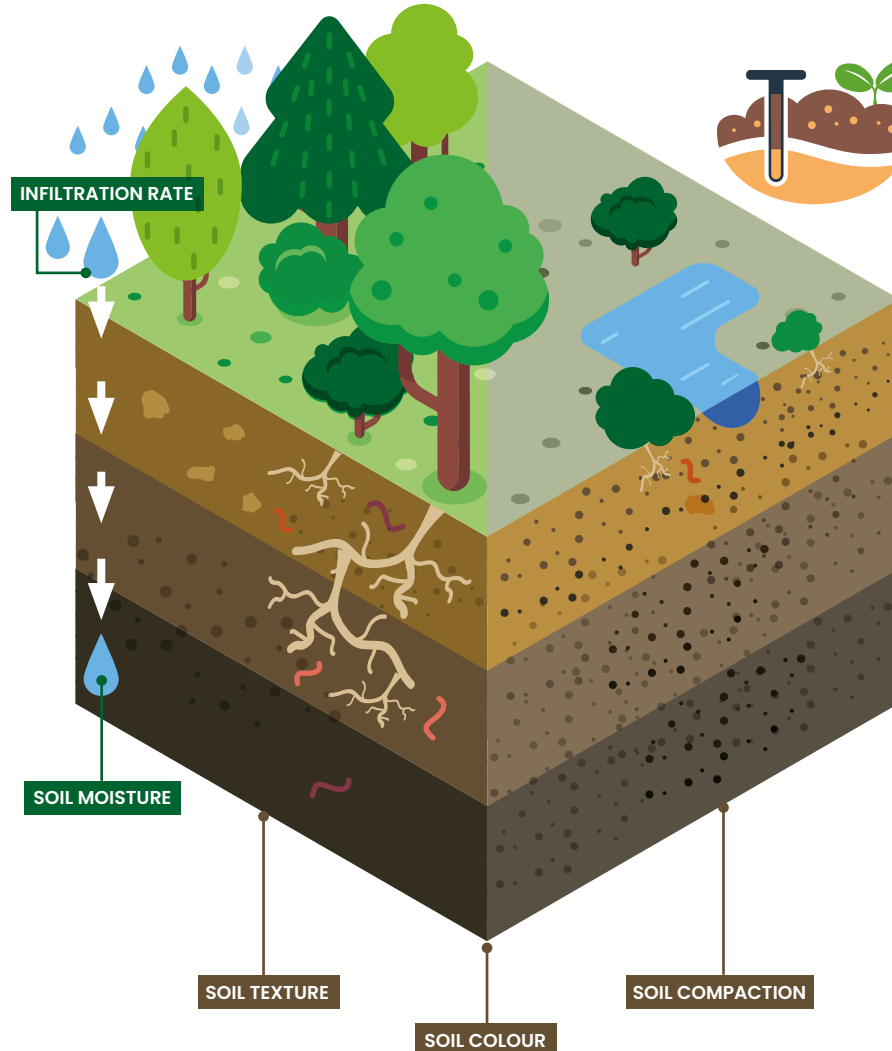
**70**   
Tiny Forests

**122**   
Surveys

**542**   
hours research time

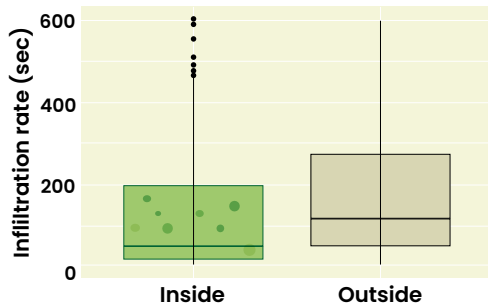
We record the factors that influence the amount and rate that water can infiltrate into the ground. These factors determine how much space there is in between soil particles.

## TINY FOREST FLOOD MANAGEMENT MEASUREMENTS



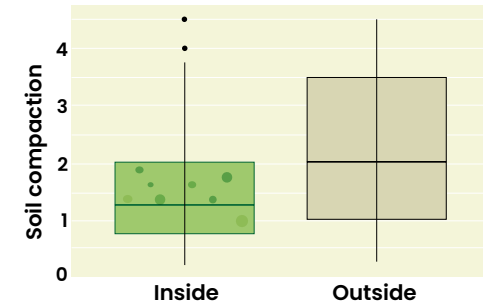
### INFILTRATION RATE 24% FASTER INSIDE TINY FOREST

inside (n=185) vs outside (n=80) (2023)



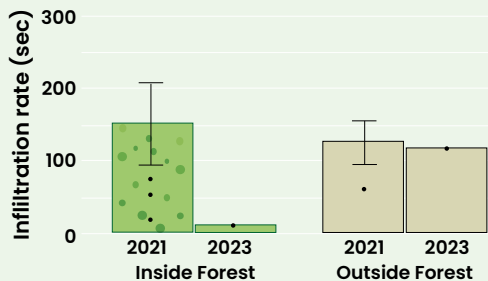
### SOIL COMPACTION 39% LOWER INSIDE TINY FOREST

inside (n=130) vs outside (n=59) (2023)



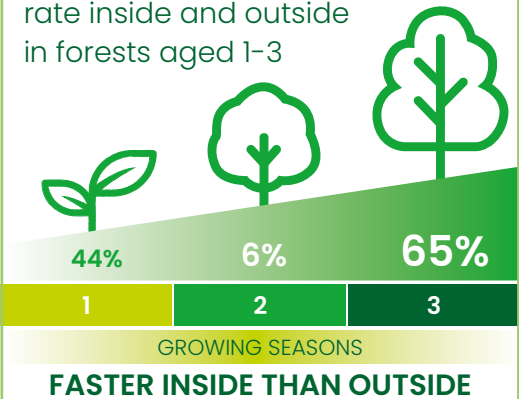
### Tiny Forest Spotlight

Hammersmith Park, Hammersmith and Fulham  
Planted 8th March 2021



### How does infiltration rate change as Tiny Forests grow?

Comparing infiltration rate inside and outside in forests aged 1-3





# Flood Management

## RESEARCH AMBITION:

What is the potential capacity of Tiny Forests to store water by changes to soil quality and improving permeability as the forests grow? How does this compare to surrounding soils?

Risk of flooding in urban areas, due to increased frequency of extreme or prolonged rainfall, is exacerbated by the extent of impermeable surfaces such as concrete and paving.

All urban trees play a role in the water cycle and provide flood management services. Tree leaves, branches and trunks catch rainwater as it's falling, slowing the rain reaching the ground. Tree roots help water penetrate deeper into the soil at a faster rate, reducing surface run-off and storing more water in the soil.



Infiltration rate depends on the characteristics of the soil, which also tell us more about the health of the soil in a Tiny Forest.

A total of 189 surveys were conducted on *soil texture, colour and compaction* in 2023; 130 surveys measured compaction inside the forest and 59 outside the forest.

## Infiltration rate increases as Tiny Forests grow by:



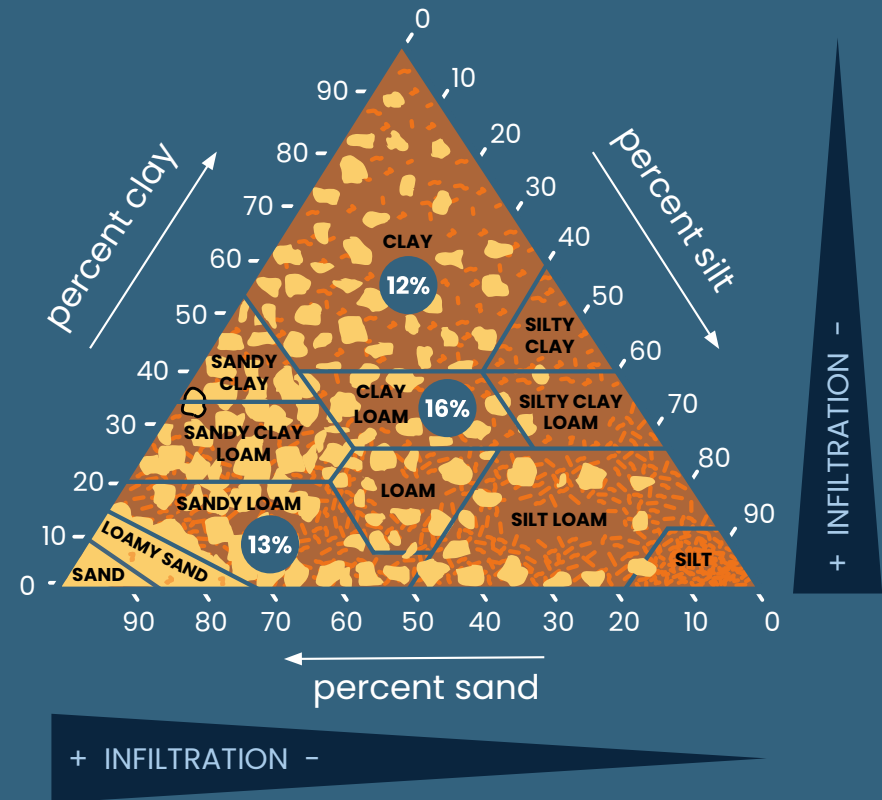
Reducing soil compaction by preparing the soil and mixing in supplements



Creating channels and pores in the soil as roots grow, improving soil structure



Increasing organic matter (e.g. leaves, bark) creates humus, and increases soil nutrients.



**Sand** (0.06 to 2mm) **Silt** (0.004-0.006mm) **Clay** (<0.004mm)

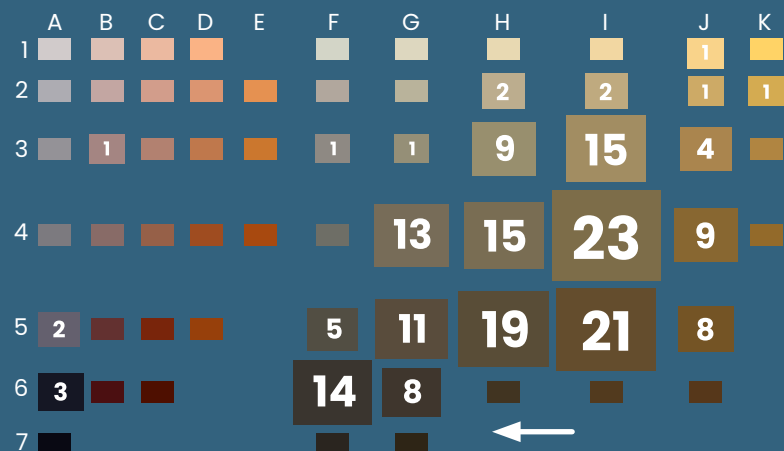
**Soil texture** describes the proportion of sand, silt and clay sized particles. This in turn affects how water can soak into the soil; clay soils with very small particles close together are much less permeable for water while in sandy soils water can more easily infiltrate through the gaps between the larger particles.

The most commonly sampled soil textures in 2023 were **Clay Loam (16%), Sandy Loam (13%)** and **Clay (12%)**.



**Soil colour** tells us about the amount of organic matter in the soil, the darker the colour the higher the concentration of organic matter, providing a rich supply of nutrients to the trees and plants in the forest.

The figure below indicates that the most commonly recorded soil colour was 14 and 5 but there was quite a lot of variety with some soils having much lower organic matter content and a few with really dark rich soils.



**Compacted soil** is a problem for root and tree growth but also causes more surface run off as there is less space between the particles for water to soak in. The average soil compaction in 2023 inside Tiny Forests was 1.66 kg/cm<sup>2</sup> (n = 130) and outside was 2.31kg/cm<sup>2</sup> (n = 59) which means that on average, soil compaction was 39% lower inside compared to the surrounding area!



These changes are initially a result of our pre-planting soil preparation, as part of the Miyawaki planting method, where we excavate/rotavate the soil to get rid of decades of soil compaction.

1. Kruskal Wallis test showed significant difference (p=0.0014) with compaction measurements lower inside the forest than outside (from data sampled in all years).

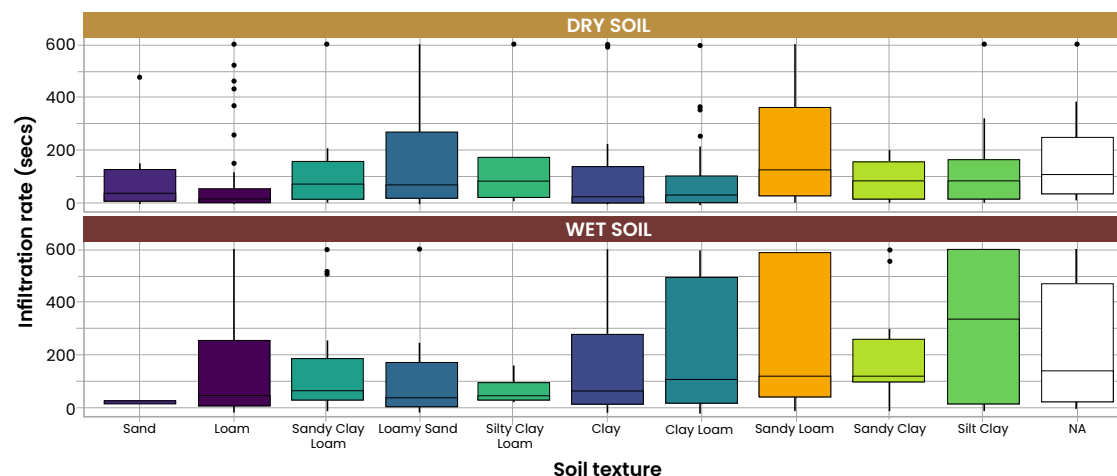
2. Kruskal-Wallis test showed effect of soil moisture had a significant effect (p=0.0037) on infiltration rate which was significantly faster in dry soils

3. Statistically significant (p<0.0001; Kruskal-Wallis test) difference between infiltration rates inside compared to the outside the forest

## Soil moisture and infiltration rate

Soil moisture is categorised by citizen scientists before infiltration measurements are taken – when soils are already saturated, there is less space for new rain water to soak away. This is clear across all soil types; when soil is dry (top graph) infiltration rate is significantly faster than when soil is wet (bottom graph), particularly for soils with higher clay content (Clay, Clay Loam, Silt Clay)<sup>2</sup>.

These data are from flood management surveys carried out since 2021 (n = 630).



On average for all Tiny Forests monitored in 2023, the infiltration time inside the Tiny Forest was 164 seconds (n = 185) and outside the Tiny Forest was 204 seconds (n = 80).

**This means that, on average, the infiltration rate was 24% faster inside a Tiny Forest compared to the surrounding areas in 2023.**

Infiltration rate is faster, and soil compaction is lower inside the forest than local surrounding land from the first growing season and initial data indicate that the differential increases as Tiny Forests grow, indeed, infiltration rates were as much as 65% faster inside than outside the forest recorded in the oldest Tiny Forests (n=41).

### CITIZEN SCIENCE CURIOSITY CHALLENGE

Soil moisture, the amount of water already in the soil, plays a role in the rate of water infiltration. As intense periods of heavy rainfall are projected to increase in frequency with climate change, we want to see whether Tiny Forests are better than surrounding land in absorbing water even after heavy rain.

To help answer this question – keep an eye on the skies get out after heavy rain and do the Flood Management survey!



# How do Tiny Forests grow and store carbon?

**123** Tiny Forests **6602** Surveys

**TALLEST TREE:** Individual tree: **Goat willow** at **Tychwood, Witney** (3 years old), **6.5m**

**THICKEST STEM:** **Alder** at **Pencoedre Park Coed Bach, Barry** (2 years old), **49.78mm**

**OLDEST FOREST:** **Tychwood, Witney Tiny Forest** (3 years old) is estimated to be storing as much as **924kg** of above ground carbon.

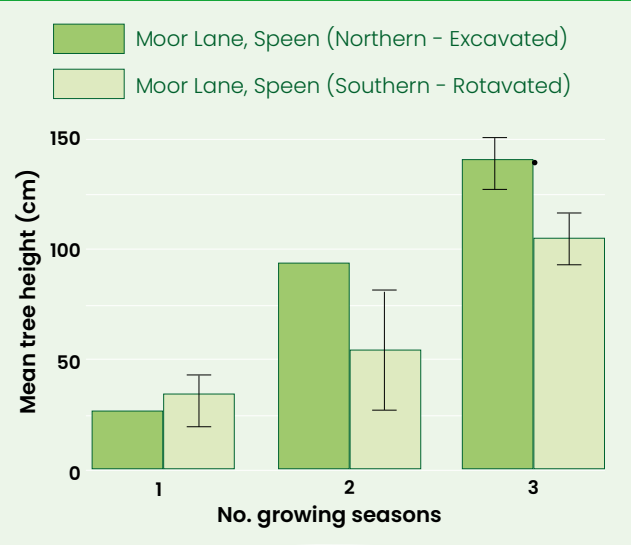
**LARGEST TREE:** An **elder tree** at **Tychwood, Witney** (3 years old) Above ground biomass: **8.78kg**  
**2.20 kg** of carbon **3.91m** tall and **6.24mm** wide

**SMALLEST TREES:** Individual: **English oak** at **Bonnyrigg primary school, Midlothian** (1 year old), **5cm** (a new shoot growing from a the stem of a broken whip – trees are so resilient!)

## TOP 3 COMMON SPECIES MEASURED:

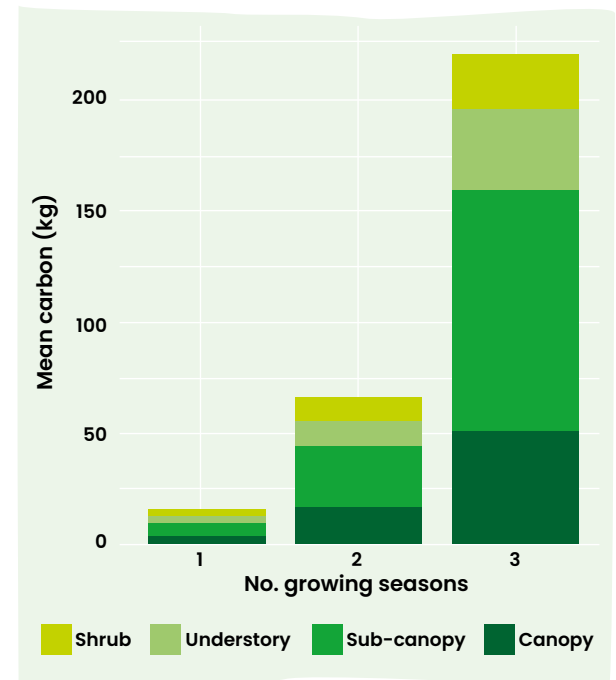
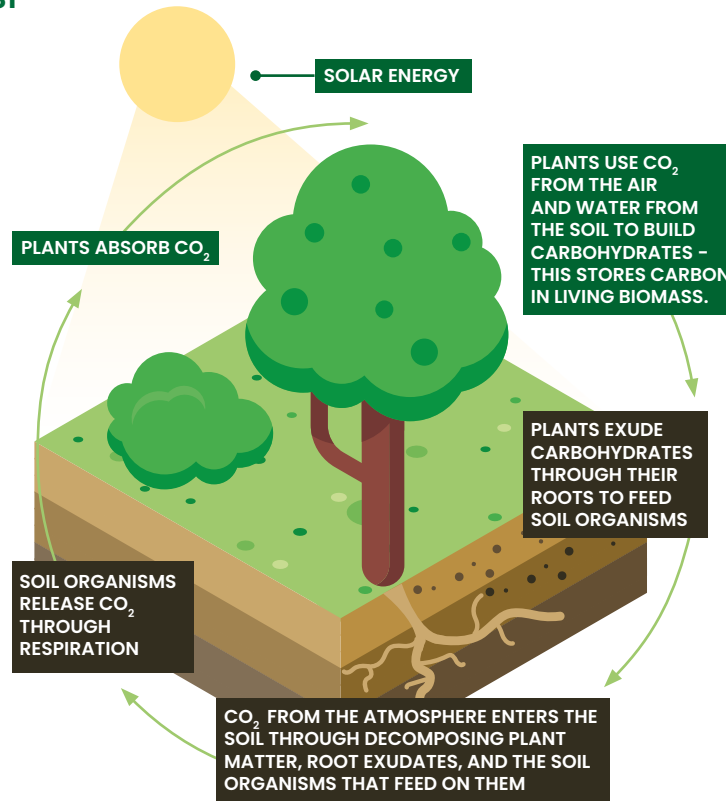
**Silver birch, n = 658, English Oak, n = 588, Sessile Oak, n = 481**

## Tiny Forest Spotlight



## TREES GROW SIGNIFICANTLY TALLER WHEN PLANTED IN EXCAVATED SOIL

(for 3rd growth season,  $p < 0.0001$  \*\*\*, Kruskal-Wallis test)



**13-FOLD INCREASE IN MEAN CARBON CONTENT** in Tiny Forests between the first and third growing season!

# Tree Growth and Carbon Storage

## RESEARCH AMBITION:

How does tree growth and carbon storage vary across the Tiny Forest network annually? How does this vary by tree species and forest layers?

Trees capture carbon from the atmosphere through photosynthesis and lock this carbon away in living biomass, such as the tree leaves, trunks and roots. In fact, approximately half of the dry weight of a tree is carbon.

A representative sample of 100 trees are tagged in each Tiny Forest during planting day. Citizen scientists monitor their trees by measuring the diameter, height and mortality of these tagged trees each year to record their growth.

Since October 2022, the Tiny Forest Carbon Storage survey has been completed 6,602 times, measuring 56 different tree species across 123 Tiny Forests. Several of our Tiny Forests now have trees that are too tall to measure using current methods. 46 trees were recorded as too tall to measure, these were included in the calculation below at an assumed minimum height of 700cm.

We can estimate that in total, there is at least 4.6 tonnes of above ground carbon stored in all 212 Tiny Forests in UK and Europe. This equates to nearly 16.8 tonnes of CO<sub>2</sub>e (carbon dioxide equivalent)<sup>1</sup>. With the oldest Tiny Forest (3 years) estimated to be storing as much as 924kg carbon above ground.

While each Tiny Forest may only make a small contribution to the climate crisis in terms of absolute carbon stored, the rate of forest development and the cumulative impact of all forests shows the power of the Tiny Forest network. Indeed, your data shows that there is a **13-fold increase in mean carbon content** between the first and third growth season. Collecting more measurements will help us understand Tiny Forests growth dynamics and how carbon storage changes over time.

**Sub-canopy layer grows faster and stores more carbon than shrub and understory in the first three years<sup>2</sup>.** The sub-canopy layer currently contributes the largest amount to carbon storage, as it contains the tallest trees. This is likely due to the contribution of silver and downy birch trees, which are known to be rapid-growing pioneer species. They are also nurse species, in that they protect other more slow growing or delicate young trees as they grow and draw up nutrients from deeper in the soil.

1. CO<sub>2</sub> e calculated as 3.67 x total carbon, as per the guidance in [Trees for the Future carbon brief](#).

2. Using statistical testing (ANOVA and Tukey's HSD), we established the sub-canopy consistently significantly differs from the shrub and understory forest layers across all three years of growth.

## GROWING UP WITH TINY FOREST

Harry and his little brother planted their Tiny Forest with their mum in 2019, just before lockdown. They have since been visiting their Tiny Forest regularly, having picnics and collecting vital citizen science data!

Credit: Tree Keeper Rachael Bunting, Tychwood Tiny Forest, Witney.



"We took our small scientists down to White-Breasted Waterhen Tiny Forest to trial-run our newly replaced tiles for the ground dweller survey. "Some of our trees are now as tall as me" – one year on from their planting day. [This is] the tallest in the patch, seven-year-old for scale."

– Sarah

Credit: Tree Keeper Sarah Clark, White-Breasted Waterhen Tiny Forest, Whitehouse Farm Park, Derby.



# Miyawaki Method and tree growth

## Soil preparation affects Tiny Forest tree growth.

Tiny Forests seek to understand how trees grow in different situations. One of the major features of the Miyawaki method is the soil preparation. This typically involves excavation, digging over the soil and addition of supplements to reduce compaction and improve water holding capacity of the area to give the trees the best possible growing conditions.

Tiny Forest is interested to find out how these methods impact on tree growth and have a subset of sites to explore this. Moor Lane in Speen is home to two Twin Tiny Forests planted adjacent to each other, one with the soil prepared by excavating to 1m, while the other site was rotavated with soil turned over to a depth of 30cm. The difference in average tree growth is demonstrated in the graph on [page 12](#). **Trees are significantly taller (33%) in the excavated site by the second growing season and this difference persists in the third growing season.<sup>1</sup>**

Northern site - Soil excavated to 1m depth



Southern site - Soil rotavated to 30cm depth



1. statistical testing (Welch's t-test) showed the soil preparation method (excavation vs rotavation) has a significant effect ( $p=0.01$ ) on the tree growth between the two sites in the third growing season

## Miyawaki Research Forest

Earthwatch Europe is leading the Miyawaki Research Network and, with support from a private land owner and major donor, have planted a research forest in Castleton, Derbyshire (planting carried out in Nov 2022 and March 2023). Earthwatch Europe seeks to compare the Miyawaki tree planting method against other conventional approaches and the site consists of 600m<sup>2</sup> Miyawaki Forest (equivalent to 3 Tiny Forests adjacent to each other) excavated to 1m depth. Adjacent to this are two 100m<sup>2</sup> plots, where trees were planted conventionally (no soil preparation) with 2m spacing between saplings. Initial data collected in the first year of tree growth indicate that trees in the Miyawaki Forest are on average taller than those in the conventional plot by 6cm. Whereas stem diameters are similar in both.

MiRN partners Trees Outside Woodland Programme are running a [Miyawaki trial](#) across five local authorities. These plots include a Miyawaki trial forest and conventionally planted forest, which were planted in 2021. Initial lessons learnt demonstrate 99% survival in the Miyawaki plot during summer drought in 2022, compared to 76% in the adjacent conventional plot. They estimate that the overall costs of establishing trees in conventional plots is greater than in Miyawaki plots due to reduced resilience and lower survival rates, at least in the first two years of forest growth.

## CITIZEN SCIENCE CURIOSITY CHALLENGE

Tiny Forest Citizen Science is always developing! We are assessing our carbon survey methods to overcome the challenge of tags going missing and developing a way to measure trees that are too tall to measure with a tape measure. There are a number of tools available for mature trees but most require the tree to be in an open space.

This year, 46 trees were reported as being 'too tall' to measure using current survey methods, these were all sites with two or three seasons of growth. The three most common species for these tall trees were silver birch, downy birch and alder. It will be fascinating to see how the different species grow as the forests develop.

To help us develop these solutions look out for an invitation to join a special carbon survey discussion!

# Thermal comfort

## RESEARCH AMBITION:

Do Tiny Forests have a cooling effect? Do local microclimate conditions differ within the Tiny Forest compared to urban surroundings and how do people perceive these differences in terms of thermal comfort?

59  
Tiny Forests

592  
Surveys

During 2023 a total of 59 Tiny Forests were measured. Our citizen scientists took a total of 3,552 measurements; 592 samples for each of the six different metrics of thermal comfort. When analysing across all forests for their respective growth seasons, there wasn't evidence for a difference in conditions (air temperature, humidity or wind speed) between the middle of the Tiny Forest and the outside, or near grey infrastructure! This is likely because many forests are still very young combined with the fact that weather data is extremely variable spatially and temporally.

This year, we showcase the twin forests at Moor Lane in Speen (also see Tiny Forest spotlight in carbon results). We chose this site because it has been growing for three full seasons and is starting to develop a canopy, the density of which differs between the two soil preparation methods.

**We found that in the taller Tiny Forest (with standard soil preparation (1m deep)) the air temperature was on average 6°C cooler (30.27°C) inside the Tiny Forest than outside (36.41°C), similarly humidity was higher in the middle (52%) of the Tiny Forest than outside (39%)<sup>2</sup>.**

These are the cooling effects that we would expect to see from canopy shading and transpiration (water loss from leaves).

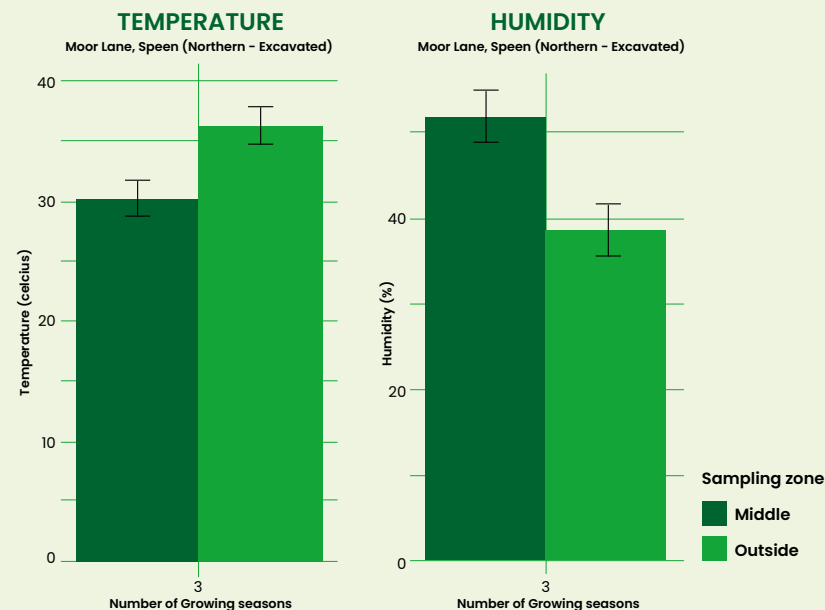
**In contrast, the rotavated Tiny Forest**

**does not show a significant difference between the middle or outside, for either air temperature or humidity.** From those who know the site, this makes sense as the rotavated Tiny Forest has smaller trees with a more open canopy. Suggesting that trees start to influence thermal comfort when they are taller and more vegetatively dense and Tiny Forest soil preparation and subsequent faster growth brings these benefits sooner.

As the Tiny Forests are still in their initial stages of growth, the research on thermal comfort is at a very early stage. However, the Speen case study shows some promising results and suggests how they may be directly associated with tree growth and development of the forest.

Research shows that trees can cool UK cities by ~11oC (Schwaab et al., 2021)<sup>3</sup>. This also emphasises the need to initiate urban tree planting now to have an impact in future as urban temperatures will continue to increase more than in rural areas through the Urban Heat Island effect.

The cooling effect increases with age, height and canopy size, as such when the Tiny Forests' grow taller, we expect to see lower temperatures and higher humidity and will be exploring how this influences how people perceive these differences in terms of thermal comfort.



**Average air temperature inside a Tiny Forest is 6°C cooler and humidity higher than outside the forest.** This difference (inside vs outside) was recorded in the taller forests with trees on average 1.3m tall, but was not apparent in the rotavated forest where trees were on average 30cm shorter



1. there is no significant difference ( $p > 0.05$ , Welch's two-sample t-test), 2. we found significant differences in temperature ( $p = 0.01$ ) and humidity ( $p = 0.009$ ,  $n = 8$ ) between the middle and outside (Kruskal Wallis, followed by a Dunn's post hoc. test), 3. Schwaab, J. et al. (2021) The role of urban trees in reducing land surface temperatures in European cities. Nature Communication, 12, 6763.



# Social

## RESEARCH AMBITION:

What is the social reach of Tiny Forest – does the scheme help a diverse range of people to engage with this place-based greenspace intervention? To what extent does participation in Tiny Forest improve people’s ‘connection to nature’?

There is growing evidence that trees improve mental and physical health. The positive impacts of daily doses of nature for boosting health and wellbeing has been estimated to save the NHS millions of pounds every year<sup>1</sup>. Tiny Forests can support peoples’ health and wellbeing through aesthetic value, opportunities to watch wildlife and personal involvement in the project. We build on this by increasing people’s connection to nature through education, engagement and citizen science activities.

## ACTION!

To understand the benefits of engaging with the Tiny Forest project, you are invited to complete our Social Impact Survey (via your Tiny Forest Profile “Take a Survey” link). Your responses will help us to understand the diversity of people engaging with Tiny Forest and to tell us more about how people’s connection to nature changes as they see their Tiny Forest grow!

## What are Science Day highlights?

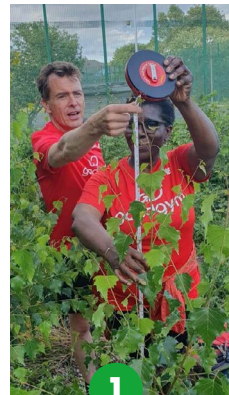
Carbon Storage, Flood Management and Biodiversity surveys were highlighted as participants favourite Citizen Science activities on Science Days!

### FLOOD MANAGEMENT



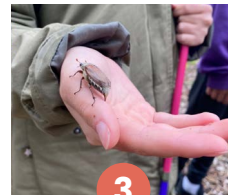
2

### CARBON STORAGE



1

### BIODIVERSITY – GROUND DWELLER AND POLLINATORS



3

1. <https://pubmed.ncbi.nlm.nih.gov/26540085/>  
<https://www.fieldsintrust.org/revaluing>

<https://www.nature.com/articles/s41598-019-44097-3>  
<http://publications.naturalengland.org.uk/publication/35009>

# TINY FOREST - IMPROVING ACCESS TO NATURE

The Government **Environment Improvement Plan** includes targets to provide all people with access to a green or blue nature space within a 15 minute walk of their home. Earthwatch Europe and our partners want to ensure Tiny Forests are for everyone and seek, where possible, to plant Tiny Forests in areas where inequalities in access to nature are most strongly felt.



National Indices of Multiple Deprivation IMD (England, Wales and Scotland) can be used to indicate areas experiencing such environmental inequality. Scores reflect seven themes considered essential to life, society, living well and growing up well including income, employment, education, health, access to services, crime and living environment. To date, looking at IMD scores for the surrounding area of each Tiny Forest (within 800m), shows that 51% of Tiny Forests are accessible for people, within a 15-minute walk of home in areas with a score of 1-4 (the 40% most deprived areas).



# Tree Keeper stories



Tiny Forest and GoodGym volunteer Paul Salman, and his dog Gus, took to the road in their campervan on a Tiny Tour during 14 – 24 August 2023, visiting **seven Tiny Forests from Oxford to Nottingham**. Travelling almost 200 miles over 11 days, Paul met with fellow GoodGym volunteers, local Tree Keepers and local communities to encourage them to connect with their local Tiny Forest. He led a variety of activities at each forest including yoga, forest maintenance, and citizen science! Read more about Paul's experiences on tour in his blog [here](#).

*Credit: Paul Salman*



**News from Ladywell field Tiny Forest, Lewisham**, Caroline: 'We have had a busy year at Ladywell Fields Tiny Forest. We have been mulching, weeding and measuring the saplings which were planted last winter. Judging by the number of insect bites we got at midsummer, biodiversity has definitely increased!

*Credit: Akira Suemori for The Sunday Times, Ladywell field Tiny Forest, Lewisham, London.*



## Intergenerational Tiny Forest Love!

Gabby: 'Updating on a weeding session that happened at our Tiny Forest in Ladywell, Southeast London a few weeks ago. We met the other volunteers and learnt a lot about our Tiny Forest! My 10 yr old daughter is the Tree Keeper (I just help with access), and we also got my 82yr old mother-in-law down as she lives nearby, and her little sister is now getting involved too. Thank you for all the support.'

*Credit: Tree Keeper Gabby Shiner-Hill, Ladywell field, Lewisham TF.*

# Tiny Forest Birthdays!



**Barnet birthday bash!** Sharing some pictures from the Tiny Forest birthday celebration at Mutton brook, Barnet. Cake and Carbon Survey! That's the Tiny Forest way to do it.

How are you celebrating your Tiny Forest's birthday?

*Credit: Tree Keepers, Paul Salman and Daniel Mermelstein, Mutton brook Tiny Forest, Barnet, London.*



Sarah: '**Happy birthday to White-breasted Waterhen tiny forest site in Derby!** On the first anniversary of its planting day, we gathered some Tree Keepers and cake, and dug up some more thistles as a birthday gift to the tiny trees. Notable sightings today include an oak gall on a tiny oak, and a very orange bee. In the surrounding areas, lots of blackthorn blossom and evidence of recent hatchlings.'

*Credit: Tree Keeper Sarah Clark, White-Breasted Waterhen Tiny Forest, Whitehouse Farm Park, Derby.*





Tree Keeper Rachael Bunting, Tychwood Tiny Forest, Witney.



Tree Keeper and Good Gym volunteer Paul Salmon's Tiny Tour yoga sessions.



Tree Keeper Melanie Boyle, Monkton Park Tiny Forest, Chippenham. Melanie: *'Early earth protectors had a lovely time getting some biodiversity data for our local Tiny Forest this evening.'*



Tree Keeper Andy Gibson, Papua New Guinea Tiny Forest, Stafford. Andy: *'On the Biodiversity analysis at 'Papua New Guinea' (Stafford) this morning, guess what, baby newts under the cement slabs. Really exciting find!'*





Tree Keepers Sarah McKenzie (left) and Ian Mumford (right), Frank Bott Avenue Tiny Forest, Crewe. Ian did an amazing job again, fixing the Tiny Forest fence with an improvised strut attached with wire and replaced two spars. Thank you, Ian! And Sarah doing some weeding in May: 'These are some pics of how well our trees are doing in Crewe today I hadn't checked the weather and got a good soaking!'



Tree Keeper Andrea Pitrik (image on left) and Hayley Jayne (image on right), Mentmore Recreational Ground Tiny Forest, Dunstable. The Mentmore Recreational Ground Tiny Forest won the Anglia in Bloom award for the Nature Conservation Category! Tree Keeper Andrea shared this news with us: 'My heart skipped a beat (from happiness) when I saw that our amazing little project has won an award!'. Image on right: a frosty Dunstable Tiny Forest from January 2023.



Tree Keeper Sheena McDonald, Govan Road Wee Forest, Glasgow: Sheena who is with the Glasgow Science Centre commissioned a beautiful mural behind their Wee Forest. The mural was painted by a local artist and designed based on community consultation.



Tree Keepers Geoff Patmore (L) and Halinka Caroline (R) East Lancing Recreation Ground Tiny Forest, Lancing. Geoff: 'Our Tiny Forest at Orient Road recreation ground Lancing is really flourishing. We lifted the slabs to investigate insects etc. and found 3 large ants nets at the time of swarming ants, great for soil aeration and mulch'.





Tree Keeper Val Hulme, Wilmslow High School Tiny Forest.



Tree Keeper Lucyna Kaniecka, Southmere Park Tiny Forest, Thamesmead. Watering session, summer 2023.



Tree Keeper Sharlene Truby, Stanford Reservoir Tiny Forest, Lutterworth. Sharlene: 'Tiny Forest at Stanford Reservoir wet day of weeding.'



Tree Keeper Helen Viner, Egford Lane Park Tiny Forest, Frome. Helen: 'Frome Tiny Forest has grown. It's had a weed recently and we're looking forward to carrying out some citizen science workshops next week.'

Tree Keeper Martin Wright, Hobbayne Primary Tiny Forest, Ealing. Martin: 'The Hobbayne Tiny Forest is looking great in the sunshine. It's been only 15 months since the planting day. We are all looking forward to seeing it grow and grow over the coming years!'

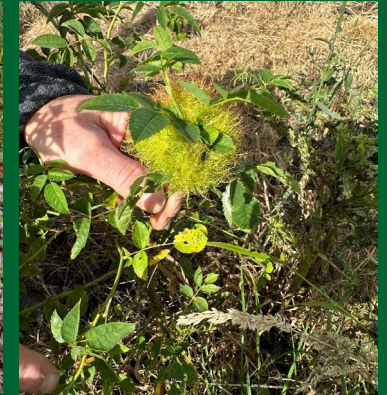






Tree Keeper Paul Stubbington, Fleming Park Tiny Forest, Eastleigh. Paul 'Eastleigh Fleming Park Tree Keepers paid a visit today. There wasn't much work needed but it was good to see the Forest thriving and starting to create quite a diverse environment.'

Tree Keeper Geraldine Bellingham, Station Road Tiny Forest, Coleshill (L), Tree Keeper Andy Gibson, Papua New Guinea Tiny Forest, Stafford. Coleshill Tiny Forest seems to be a popular destination for the oak marble gall wasp while Rose galls are making their home on the dog roses in Stafford.



Tree Keeper Jenni Coy, Askern Littlemoor, Doncaster. Jenni: 'Our Tiny Forest in Doncaster is huge this year! I lost my colleague in it today. Also, can you spot the frog visiting our pond. We had 2 today!'



Dr. Patrick Walsh (L), Tychwood Tiny Forest, Witney. Patrick, a teacher from Portland, Oregon, who has planted his own Miyawaki forest along with his students in the US visited us in August 2023. He was a joy to be with and he managed to visit close to a dozen Tiny Forests, taking part in our events, meeting Tree Keepers and hopefully taking back a lot of learning and lovely memories. You can read his blog post of his visit to the Tychwood Tiny Forest, Witney [here](#). Joining Patrick (from left to right), Tree Keeper Carl Whitehead, Mayor of Witney Councillor Owen Collins and our very first Tree Keeper, Mark Aitman.



Tree Keeper Andrew Featherstone, Five Trees Tiny Forest, Cambridge.  
Andrew: 'A bit of weeding with some cool summer rain this evening.'



Tree Keeper Helen Stokes, Queen's Park Tiny Forest, Hinckley. Helen: 'Our little family crew, plus a couple of friends started weeding our very overgrown Tiny Forest in Queens Park in Hinckley. It was hot work but we hopefully gave some of the plants and trees a better chance to grow and flourish!'



Tree Keeper Karen Dunstan, William Torbitt Tiny Forest, Redbridge, London. Karen: 'Children had lots of fun observing and sketching the trees using charcoal from previous Forest School campfire sessions.'



NHS Forest have awarded Littlemore Mental Health Centre Tiny Forest an award for most innovative use of green space for health and well being. [Read more.](#)



# Tiny Forest poetry

## Barnet Tiny Forest

*1st Birthday Celebratory Poem  
by Paul Salmon*

In the heart of Barnet lies a little space,  
The Tiny Forest, a peaceful embrace,

A plantation of trees that grow tall and strong,  
With leaves that rustle as the winds come along.

These trees are our guardians, so wise and so true,  
They take care of our planet, for me and for you,

With roots that reach deep into the soil,  
They help keep the air we breathe pure and royal.

The leaves release oxygen with every breath,  
And cleanse the air of pollutants that lead to death,

The soil they enrich, creating a home,  
For creatures great and small, like a kingdom grown.

In the Tiny Forest, the sun dances through,  
A symphony of light, a vision so true,

And as we stand beneath its branches so green,  
We feel a peace, a calmness that can only be seen.



This precious little space is a symbol of hope,  
For our community, a way to cope,

With the challenges we face each day,  
It's a reminder to take care, in every way.

So let us cherish the Tiny Forest Barnet,  
And tend to its trees, our planet's garnet,

For it's more than just a simple wood,  
It's a gift to us all, our home for good.



Credit: Tree Keepers, Paul Salmon, Mutton brook Tiny Forest, Barnet, London



## Community

*Annabel Borushek, Age 12*

The tiny forest  
By the side of a busy road  
Sucking up carbon dioxide from our cars,  
helping to clean the world  
That drought in July.  
Summoned by a message on my dad's phone.  
Some dying trees in a newly-born forest.  
Would we come help water them?  
So, we went.  
We saw neighbours, friends  
Who had come to help  
Hands reached to buckets, buckets reached to water,  
Which blossomed  
Because of our tiny forest community  
Community is what helped us overcome that drought,  
Help those trees.  
And it is community that will help us solve climate change  
I know that one tiny forest won't change the world.  
But together –  
We can all help solve climate change





# Tree Keeper Party!

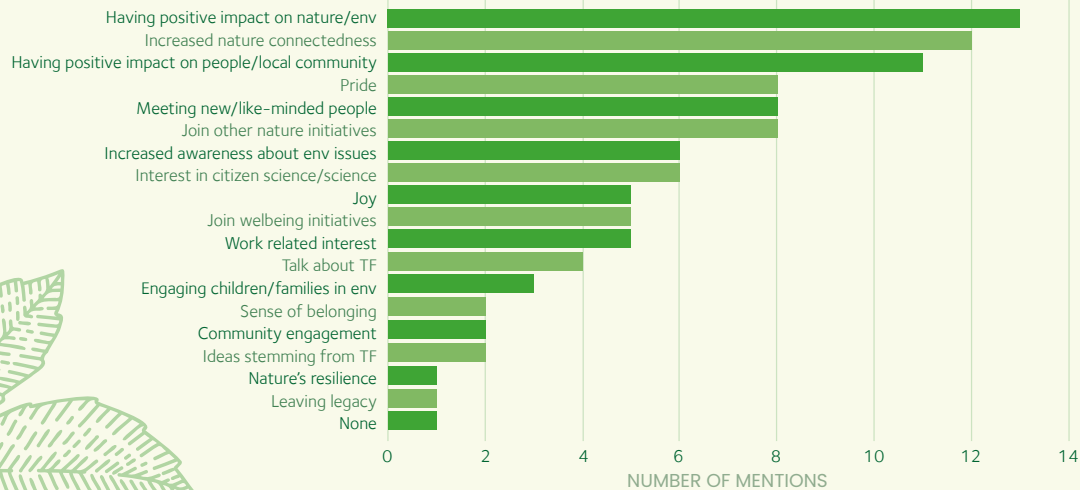
Tiny Forest volunteer “Tree Keepers” have been celebrating!

A big thank you to all the lovely Tree Keepers who joined us for the Annual Tree Parties in London on 25 November and Hinckley on 2 December 2023. It was a fantastic opportunity to meet volunteers in person, share a meal, and hear lots of fantastic Tiny Forest stories.

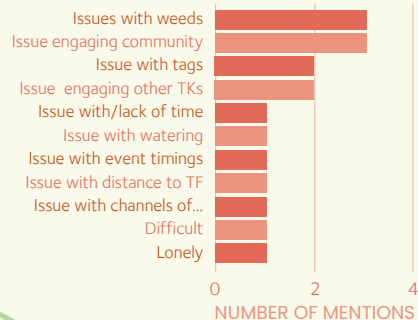
To those of you who couldn't join us, we hope to meet you at our next one! In 2024, we will be holding the Annual Tree Parties on **23 and 30 November 2024**, the locations are yet to be decided, so save the date.

## Tree Keeper Voices

### POSITIVE THEMES



### KEY CHALLENGES



As a part of the Tree Keeper Party, we invited our participants to provide us with some feedback. We asked four questions and have summarised anonymised responses into positive and challenging themes here:

- **Has being a Tree Keeper inspired you to do anything else?**
- **What are you most proud of?**
- **What difference has being a Tree Keeper made to you?**
- **What has been difficult?**



We would love to hear your voice too! Use our online form to give anonymised feedback <https://forms.gle/EuwK3VDRLqLL7pUm6>



# In it for the long run!



Dean (extreme right) and gang clear off stinging nettles in their Tiny Forest. Dean is also running the 2024 London Marathon for Earthwatch Europe to raise awareness and funds for his beloved Tiny Forest project. Go Dean!

*Credit: Tree Keeper Dean Bradshaw, Stanford Reservoir Tiny Forest, Lutterworth.*



...Our second runner for the 2024 London Marathon, Connor Smith (left) at a soggy Peckham carries out a carbon storage survey. Go Connor!

*Credit: Earthwatch Europe, Peckham Rye Common Tiny Forest, Peckham, London*



Finally, our runner from the 2023 London Marathon, Will Arnold joined us for the planting of a Tiny Forest in Bourton Park.

*Credit: Earthwatch Europe, Bourton Park Tiny Forest, Buckingham.*

Find out more how you can fundraise for Earthwatch and support our runners by visiting [earthwatch.org.uk/support-us/](https://earthwatch.org.uk/support-us/)



# Get involved

Be part of the Tiny Forest movement! Dive in as a Tree Keeper, be part of our exciting **events**, explore the wonders of citizen science, or support through **donations**.

## Become a Tree Keeper

Do you want to care for nature, connect with your local community and expand your skills? Then become a Tiny Forest volunteer and join our thriving **Tree Keeper** network! If you would like to become a Tree Keeper, fill in the **contact us form** or email us at [tinyforest@earthwatch.org.uk](mailto:tinyforest@earthwatch.org.uk)

## Become a Citizen Scientist

You can take part in monitoring your local Tiny Forest by signing up to be a Tree Keeper, or get started straight away by surveying your local Tiny Forest any time of year or by taking part in our annual Science Weeks: **Biodiversity Week** 18-26 May and **Carbon Week** 21-29 September 2024.

## Tiny Forest for Schools

Your local Tiny Forest or 'living science lab' offers great outdoor education opportunities. It provides rich connections to science, opportunities for meaningful connection to nature and cross-curricular links for creatively learning about environmental challenges and solutions in an inspiring green space. For more information and learning, check out our **educational resources**.



## MIYAWAKI RESEARCH NETWORK

We are coordinating a Miyawaki Research Network bringing together organisations and individuals interested in the research aspect of the Miyawaki methodology. It is growing with over 50 members including members from Europe, North America, Australia and India!




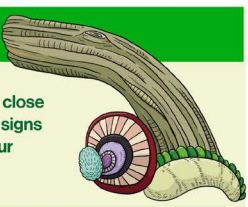

It provides a space to share expertise, develop consistent methods for data collection and research as well as building collaborations to maximise our understanding on the environmental and social impacts of this planting methodology.

Through these partnerships we are building annual opportunities for student projects at undergraduate, Masters and PhD level.

If you are interested in getting involved, please get in touch [tinyforest@earthwatch.org.uk](mailto:tinyforest@earthwatch.org.uk)



You can use our monthly guide to inspire you and your community to create an all-year-round engagement in your local Tiny Forest.

JANUARY		FEBRUARY		MARCH		APRIL		National days and weeks you can celebrate in your Tiny Forest
<p>Chase the winter blues in the company of our flying friends. How about birdwatching (and listening!) in your Tiny Forest?</p> 		<p>This Valentine's Day, show your love for nature and feel the love back! Visit your Tiny Forest with your date, family or friends.</p> 		<p>On International Women's Day, encourage more women, especially from BAME backgrounds, to engage in Tiny Forest citizen science.</p>		<p>Gather your community and take action for Earth Day. Or make a collective impact of One Million Acts of Science during Citizen Science Month this April!</p>		
<p><b>ACTIONS</b></p> <ul style="list-style-type: none"> <li>Tiny Forest: check safety &amp; accessibility</li> <li>Nature: birdwatching, make nest boxes</li> <li>Community: wellbeing check (invite your neighbours or family for a walk)</li> </ul>		<p><b>ACTIONS</b></p> <ul style="list-style-type: none"> <li>Tiny Forest: loosen tight tree tags</li> <li>Nature: carry out carbon survey</li> <li>Community: reflect on the benefits of nature connectedness</li> </ul>		<p><b>ACTIONS</b></p> <ul style="list-style-type: none"> <li>Tiny Forest: do ground dweller survey</li> <li>Nature: think about helping hedgehogs</li> <li>Community: share citizen science opportunities in Tiny Forest</li> </ul>		<p><b>ACTIONS</b></p> <ul style="list-style-type: none"> <li>Tiny Forest: catch-up carbon survey</li> <li>Nature: add water plants to a pond</li> <li>Community: raise awareness for the planet on Earth Day</li> </ul>		
<p><b>WEBINAR</b></p> <ul style="list-style-type: none"> <li>State of Nature Report Breakdown</li> <li>Recurring webinars: Tree Keeper Induction - 2nd Monday of every month (5pm-6pm)</li> </ul>		<ul style="list-style-type: none"> <li>Monitoring Season Research Wrap Up</li> </ul>		<ul style="list-style-type: none"> <li>Tiny Forest Monitoring - Deep Dive</li> </ul>		<ul style="list-style-type: none"> <li>Biodiversity Survey Training</li> </ul>		
<p><b>MAY</b></p> <p>Encourage people to record pollinators and butterflies in your Tiny Forest during Biodiversity Week 18 - 26 May.</p> 		<p><b>JUNE</b></p> <p>Seek inspiration from Sweden (Midsommer) and make a wreath of flowers, walk barefoot, play games, dance, and eat early summer treats in your Tiny Forest!</p>		<p><b>JULY</b></p> <p>This month, pay close attention to any signs of drought in your Tiny Forest.</p> 		<p><b>AUGUST</b></p> <p>August is when your Tiny Forest is dense and green. This means an explosion of biodiversity! Why not do another pollinator survey?</p>		
<p><b>ACTIONS</b></p> <ul style="list-style-type: none"> <li>Tiny Forest: conduct biodiversity survey</li> <li>Nature: learn about insects</li> <li>Community: improve mental wellbeing by tapping into powers of nature</li> </ul>		<p><b>ACTIONS</b></p> <ul style="list-style-type: none"> <li>Tiny Forest: check mulch layer</li> <li>Nature: schedule regular weeding in younger Tiny Forests</li> <li>Community: summer solstice party</li> </ul>		<p><b>ACTIONS</b></p> <ul style="list-style-type: none"> <li>Tiny Forest: check for signs of drought and water the trees if necessary</li> <li>Nature: conduct flood mitigation survey</li> <li>Community: plastic-free morning tea party</li> </ul>		<p><b>ACTIONS</b></p> <ul style="list-style-type: none"> <li>Tiny Forest: conduct a butterfly count</li> <li>Nature: give 'mothering' a try</li> <li>Community: organise a storytelling session in your Tiny Forest</li> </ul>		
<p><b>WEBINAR</b></p> <ul style="list-style-type: none"> <li>Behaviour of Buzzing Bees</li> <li>Recurring webinars: Tree Keeper Induction - 2nd Monday of every month (5pm-6pm)   Tree Keeper Network Chat - 4th Monday of every month (5pm-6pm)</li> </ul>		<ul style="list-style-type: none"> <li>Biodiversity Week Research Wrap up</li> </ul>		<ul style="list-style-type: none"> <li>Tiny Forest Scientists: Ask Us Anything</li> </ul>		<ul style="list-style-type: none"> <li>Carbon Week Training</li> </ul>		
<p><b>SEPTEMBER</b></p> <p>It is time to check final numbers – how much have the trees grown over the summer? Measure trees during Carbon Week 21-29 September.</p> 		<p><b>OCTOBER</b></p> <p>October is a spectacle for our senses! Enjoy the show of colours in your Tiny Forest – remember to let the leaves stay on the ground as they provide habitat and add nutrition to the soil.</p>		<p><b>NOVEMBER</b></p> <p>As things slow down for the winter, now is a good time to practice self kindness. Visit your Tiny Forest, alone or with your friends, and reflect on what kindness means in our lives.</p>		<p><b>DECEMBER</b></p> <p>December is a festive month! Celebrate Tree Dressing Day or Hindu tradition of Raksha Bandhan, Japanese tanzaku, Christmas tree decorating, or even 'yarn bombing'!</p>		
<p><b>ACTIONS</b></p> <ul style="list-style-type: none"> <li>Tiny Forest: conduct carbon storage survey</li> <li>Nature: loosen tight tree tags</li> <li>Community: reach out to your local school and conduct a carbon survey with them</li> </ul>		<p><b>ACTIONS</b></p> <ul style="list-style-type: none"> <li>Tiny Forest: admire the autumn colours</li> <li>Nature: talk to your council &amp; install a pond</li> <li>Community: be inspired by your Tiny Forest and get arty!</li> </ul>		<p><b>ACTIONS</b></p> <ul style="list-style-type: none"> <li>Tiny Forest: conduct flood mitigation survey and compare your findings from July</li> <li>Nature: build a hedgehog house</li> <li>Community: encourage self-kindness</li> </ul>		<p><b>ACTIONS</b></p> <ul style="list-style-type: none"> <li>Tiny Forest: forage for blackthorn berries</li> <li>Nature: take part in 12 Days Wild</li> <li>Community: celebrate trees by tree dressing with your community</li> </ul>		
<p><b>WEBINAR</b></p> <ul style="list-style-type: none"> <li>Autumn Activities in Tiny Forest</li> <li>Recurring webinars: Tree Keeper Induction - 2nd Monday of every month (5pm-6pm)   Tree Keeper Network Chat - 4th Monday of every month (5pm-6pm)</li> </ul>		<ul style="list-style-type: none"> <li>Carbon Week Research Wrap up</li> </ul>		<ul style="list-style-type: none"> <li>Flood Mitigation &amp; Thermal Comfort Training</li> </ul>		<ul style="list-style-type: none"> <li>Tiny Forest: forage for blackthorn berries</li> <li>Nature: take part in 12 Days Wild</li> <li>Community: celebrate trees by tree dressing with your community</li> </ul>		



# Acknowledgements

The Tiny Forest Research Programme would not be possible without the support of our funders, partners, schools and volunteers:

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Green Recovery Challenge Fund  
NatureScot  
Southwark Climate Action Fund  
Welsh Government

## Local Authorities and Landowners

Barnsley Metropolitan Borough Council  
Birmingham City Council  
Blackpool Council  
Bowling Park Primary School  
Bradford Council  
Bristol City Council  
Buckinghamshire Council  
Cambridge City Council  
Cambridgeshire County Council  
Central Bedfordshire Council  
Charnwood Borough Council  
Cheshire East Borough Council  
Chippenham Town Council  
City of Wolverhampton Council  
Countryside Partnerships  
Cranfield University  
Darlington Borough Council  
Derby City Council  
Doncaster Council  
Dudley Metropolitan Borough Council

Eastleigh Borough Council  
Frome Town Council  
Glasgow City Council  
Hinckley & Bosworth Borough Council  
Hobbayne Primary School  
Kirklees Council  
Lancing Parish Council  
Leicester City Council  
Lichfield District Council  
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London Borough of Hammersmith and Fulham  
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London Borough of Lewisham  
London Borough of Redbridge  
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South Staffordshire Council Stafford Borough Council  
The City of Edinburgh Council  
The Council of the City & County of Swansea  
The Guinness Partnership  
Thames Water

Tolka River Project  
University of Glasgow  
Wakefield Council  
Walsall Council  
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William Torbitt Primary School  
Wirral Council  
Witney Town Council

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OVO Foundation  
Peabody  
Price & Myers  
Reckitt Benckiser Group  
Severn Trent Water  
Siemens  
The Guinness Partnership  
Vaillant Group  
VolkerWessels  
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