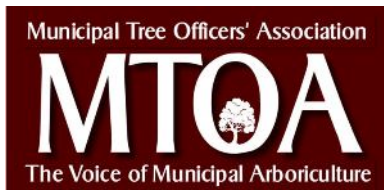


Philip Handley

GIS Specialist

Forest Research



2019 National Tree Officers Conference

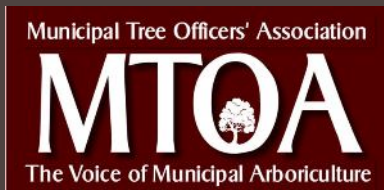


#TreeOfficerUK

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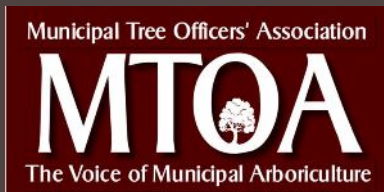


#TreeOfficerUK



NTOC

National Tree Officers
Conference



Institute of
Chartered Foresters



LTOA

London Tree Officers Association

2019 National Tree Officers Conference



#TreeOfficerUK

A common standard for urban tree data collection

Phil Handley | phillip.handley@forestresearch.gov.uk



[@Treezilla_org](https://twitter.com/Treezilla_org)





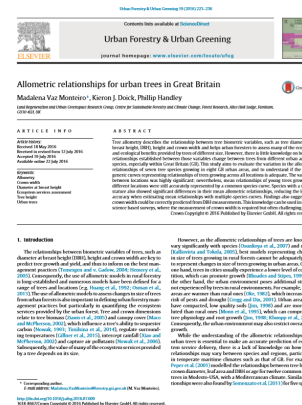
Background

Urban Forest Research Group:

- Composition of the urban forest
- Maximise the urban forest's benefit to society

Data Collection:

- Fieldwork
- i-Tree Eco surveys
- Treezilla





Issue 1: Interoperability

Combining dataset and sharing data between organisations

Species	Height	DBH	Canopy (E-W)	Canopy (N-S)	Canopy radius	Crown dieback
English Oak	60 ft	10 in	45 ft	30		7%
Ash Specise	23.4 m	35 cm			15 m	
Sycamore maple	35 m	36.3	20 m	20		
Prunus laurocerasus	5.6 m	23.3	3 m			23
Oak	36.5 m	40-60 cm	30 m	20		
Quercus robur	20-30 m	45 cm			20-30 m	50
European white birch	25-30 m	39 cm	10 m	30		50-60%
Ash Spp	24 ft	14 in	15 ft	15 ft		40-30%
Ulmus	15 m	0.2m	5 m	5		
Acer platanoides	23 m	30 cm			10	0-5



Issue 1: Interoperability

Combining dataset and sharing data between organisations

Species	Height (m)	DBH (cm)	Canopy (E-W) (m)	Canopy (N-S) (m)	Crown dieback (%)
Quercus robur	20.0	40.0	15	30	5-10%
Fraxinus	23.4	35.0	15	15	0%
Acer pseudoplatanus	35.0	36.3	20	20	0%
Prunus laurocerasus	5.6	23.3	3	3	20-25%
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Acer platanoides	23.0	30.0	10	10	0-5%

- Standardised species names
- Agreed format
- Appropriate accuracy/precision



Issue 2: Collection standardisation

Utilising data which has been collected to differing standards



Scoring condition:

- GOOD, FAIR, POOR
- EXCELLENT, GOOD, FAIR, POOR, DEAD
- GOOD, REASONABLE, FAIR, POOR, DEAD
- EXCELLENT, GOOD, REASONABLE, POOR, MORIBUND, DEAD
- GOOD, REASONABLE, POOR, VERY POOR, DYING, DEAD
- SPECIMEN, GOOD, FAIR, POOR, HAZARDOUS, DYING, DEAD



COMMUNITREE

Funder: Geospatial Commission

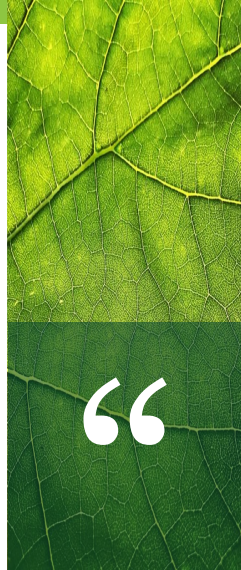
Partners: Forest Research, The OU, Treework Services Limited, Natural Apptitude

Starting: June 2019 (10 months)

Crowdsourcing of urban tree data from:

1. Large organisational datasets
2. Citizen scientists

Demonstrated in a new Treezilla Website and App

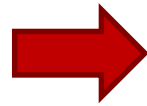


“collect once, use many times”



COMMUNITREE

**Tree data
collection
standard**

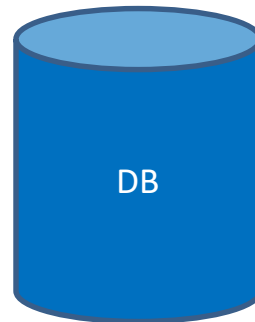


Training modules

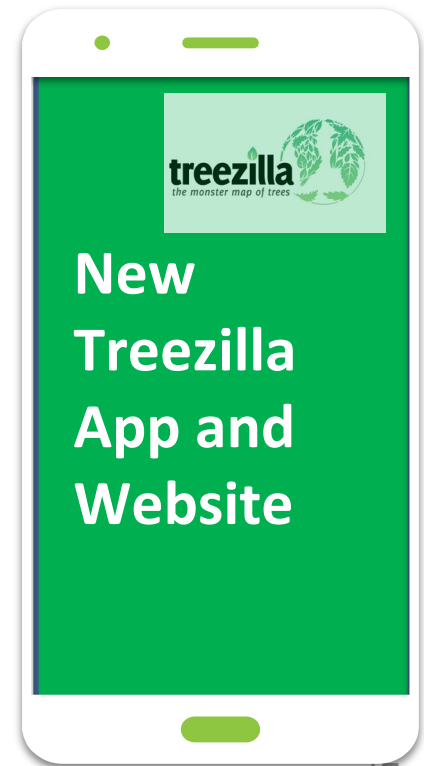
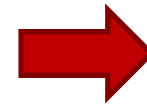
Tree information

Intelligent validation

Surveyor reputation



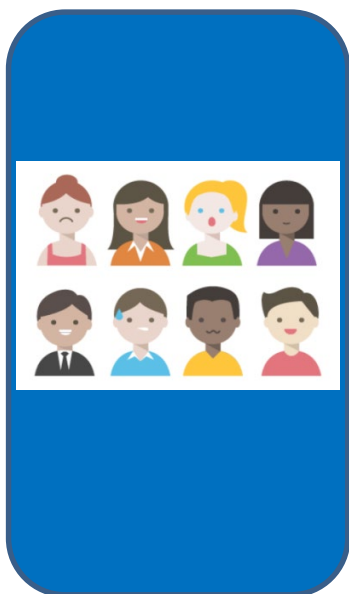
DB



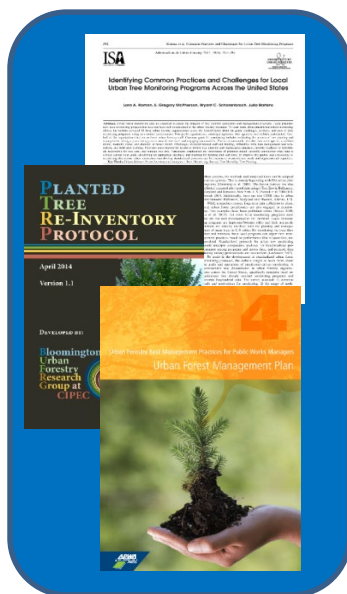


A common standard

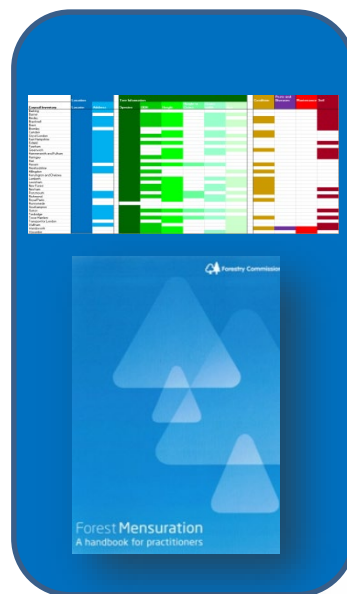
Stakeholder engagement



Published best practice



Existing knowledge



New common standard for urban tree data collection



Stakeholder engagement activities

Establishing a Standard for Urban Tree Data Collection (10th May)

- Motivations and aspirations
- Current practice
- Roadmap to production and implementation of a standard
- Draft questionnaire

2nd Tree Standards workshop (9th July)

- Identify and characterise the different potential user groups
- To establish a set or sets of data fields that form the basis of an urban tree

Data standards questionnaire

Future events

- Consultation on draft standard
- Follow-up workshop??

Data standards questionnaire



▼ Thank you for participating in this survey!

This questionnaire is part of an initiative led by The Open University and Forest Research aiming to work with the urban tree sector to establish a standard for data collection for urban tree surveys. A data standard is a document that specifies a consistent approach, method or set of methods for data collection and management. The questions are intended to help us understand the purpose and methods of data collection and use across the sector. No personal data are collected.

We will use the answers from this questionnaire to feed in to a series of initiatives that will help us co-design a data standard with the urban tree community. The standard will be made openly available for any organisation or individual to use.

Having an agreed data standard will help people and organisations with an interest in urban tree data to work together more easily and benefit from sharing data, methods and systems.

Thank you for taking the time to complete this survey. It should take no more than 15 minutes to complete.



Next



Published methods/ Best practice

	Core						Canopy	Age	Health	Location
	Position	Date	Species name	DBH	Height
Protocols										
BS5837			x	x	x		x			
i-Tree Eco		x	x	x	x		x			x
Trees in Towns	os		x	x	x			x		
Forest Mensuration Handbook				x	x					
Planted Tree Re-Inventory Proto	xy		x	x	x		x			
...										
Tools										
THREATS										
Tree Register					x	x		x	x	
Tree Alert		x	x	x		x				
Ancient Tree Inventory			x	x		x				
...										
Existing datasets										
...										
Research questions/papers										
...										

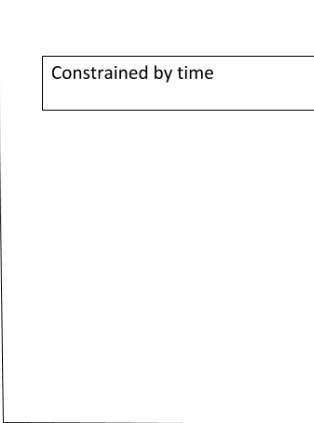
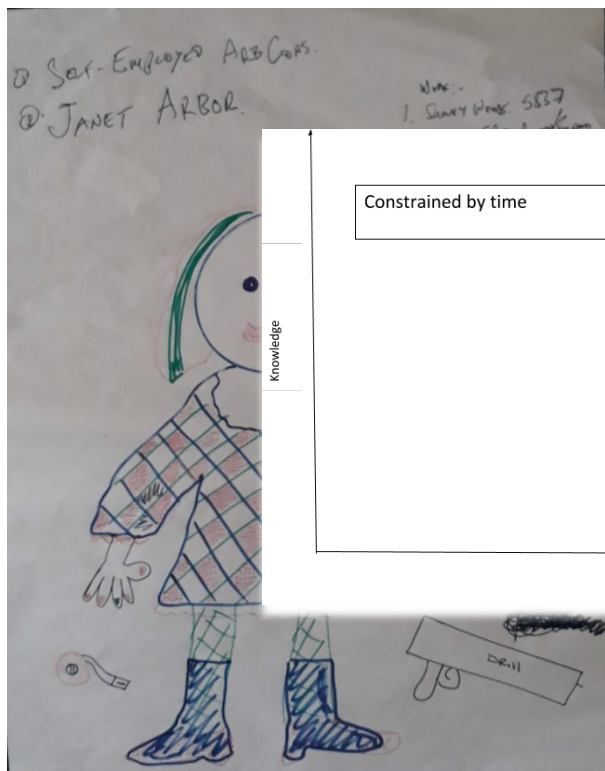
Stakeholder engagement activities



User:	Constrained professional
Description:	An individual collecting tree data for their job, but that have an external factor limiting their effectiveness. This includes tree professionals who do not have enough time to conduct a detailed tree inspection. Other individuals may need to collect tree data as part of their job but lack relevant arboricultural knowledge/experience.
Sub-types:	<ul style="list-style-type: none"> 1. Constrained by time 2. Constrained by knowledge
Examples:	<ul style="list-style-type: none"> • Tree officer • Arboricultural contractor • Environmental surveyors • Property developers
Characteristics:	<ul style="list-style-type: none"> • Collecting tree data an integral part of their job • Experienced • Time constrained • Access to equipment and computers
Data requirements:	<ul style="list-style-type: none"> • Core/minimum data likely to be universal • Limited time may make it necessary to estimate some variables <p>Reasons to collect additional data:</p> <ul style="list-style-type: none"> • Planning • Health and safety • Pests and diseases • Maintenance/management works • Valuation (Monetary & Ecosystem Services)



Stakeholder engagement activities



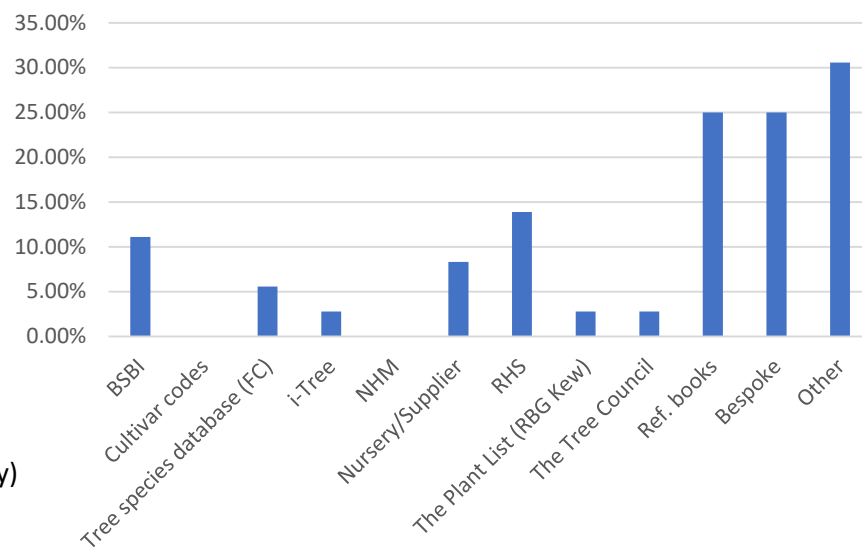
User:	Constrained professional
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	Power user Professional volunteer Experienced public
	Constrained by knowledge Inexperienced volunteer Greenspace evangelical
	Reasons to collect additional data: <ul style="list-style-type: none"> •Planning •Health and safety •Pests and diseases •Maintenance/management works •Valuation (Monetary & Ecosystem Services)



Standards framework

e.g. Which species list should be used as a basis for the new standard?

- Includes a large variety of species and most UK species
- Widely accepted/adopted by tree community
- Includes information on cultivars [Not prioritised]
- Available as electronic/digitised version
- Contains the following information [Priority order]:
 - Scientific species name [Required]
 - Common species names [Required]
 - Genus [Required]
 - Individual species identifier [Recommended]
 - Maximum height
 - Family of species
- Independently managed from this project and kept up-to-date
- Ability to include an unknown/missing species name
- Provision of change management process (e.g. change of taxonomy)





Standard [Draft] – User profiles

1. Measured standard (Caliper)

e.g. 63.2 cm

2. Estimated standard

e.g. 50-60cm

Name	DBH (largest stem)
Description	Diameter of the tree collect at 1.3m height. The largest stem needs to be collected first. On resurvey all the sixth largest stems information should be re-entered. Where tools/experience allow DBH should be collected to 1 dp; otherwise DBH should be rounded down to the nearest whole number. It is anticipated that stems above 1m will be measured.
Units	Centimetres
Required	Yes
Measured	Double (1 decimal place)
Estimated	0-5cm; 5-10cm;10-15cm; 15-20cm; 20-30cm; 30-40cm; 40-50cm; 50-60cm; 60-80cm; 80-100cm; +100cm



Standard [Draft] - Data packs

1. Core data
2. Tree age
3. Crown dimensions
4. Tree health
5. Site characteristics
- ~~6. Hazard assessment~~
- ~~7. Tree maintenance~~



Standard [Draft] – Core data

Name	Type	Estimated	Required
Tree location	XY Coordinate		Yes
Collection date	Date		Yes
Owner ID	Text		Yes
Site/Secondary ID	Text		
Tree ID	Text		Yes
Species name	Text		Yes
DBH (largest stem)	cm	Yes	Yes
DBH (2nd stem)	cm	Yes	
DBH (3rd stem)	cm	Yes	
DBH (4th stem)	cm	Yes	
DBH (5th stem)	cm	Yes	
DBH (6th stem)	cm	Yes	
Tree height	m	Yes	
Tree photograph	file		Yes*
Leaf photograph	file		
Stem photograph	file		
Flower/fruit photograph	file		
Description of tree location	Text		
Comments	Text		

How do you engage?

1. Speak with Dr Nadia Dewhurst-Richman
2. e-mail: phillip.handley@forestresearch.gov.uk
3. FR website (search COMMUNITREE)
4. QR code



COMMUNITREE
IMPROVING URBAN TREE DATA FOR RESEARCH, GOVERNMENT AND BUSINESS

Urban trees offer many benefits: ecosystem services, improved air quality, reduced noise, improved mental health, improved property values, improved biodiversity, improved water quality, improved carbon sequestration, improved air quality, improved mental health, improved property values, improved biodiversity, improved water quality, improved carbon sequestration.

However, urban trees are often overlooked or ignored by government, their contribution and benefits to the public are not always recognised.

MetOffice's tree monitoring tree health built to protect Europe's greenest city

However, a lack of data and data of variable quality - a product of evidence-based approach to optimising the benefits of trees and reducing costs, is a barrier to the use of these data for corporate, public and private organisations.

COMMUNITREE is the Open MetOffice urban space platform for helping and helping trees, people to protect and improve on open space software tool for helping, monitoring trees, helping and currently released from the data and algorithms generated to the operators.

Citizen scientists interact with the Trezilla platform by:

- Adding trees. Trezilla offers a user-friendly way of contributing data via smartphone and laptop.
- Filling tree details, to increase awareness the presence of pests or disease.
- Enabling the benefits provided to open the awareness the importance of trees in their local environment.

The COMMUNITREE project aims to update the Trezilla platform making it the go to place for reliable urban tree data.

New universal data standard for collecting urban tree data

- Coproduced with urban tree stakeholders working to improve data quality, transparency and consistency.

New and improved mobile phone app and website

- New platform co-designed with the urban tree community.
- Updated ecosystem service algorithms (EVA) improve data and tree data collection options.

Encouraging public participation in data collection

- Data collection can be done from the tree or via using the new photos and location features.
- Data collection will be done via a dedicated team which can be improved over time.

A one stop shop of urban tree data for government, business and research

- The UK's largest source of structured urban tree data.
- Contains over 100,000 tree records.

treezilla

Forest Research | KIERON DOICE
PHILLIP HANDLEY

Met Office | JANICE ANSINE
NADIA DEWHURST-RICHMAN
PHILLIP WHEELER

natural capital | DAVE KILBEY

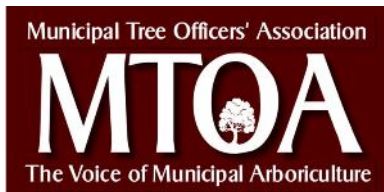
treezilla | LUKE FAY

Innovate UK | THIS RESEARCH WAS FUNDED BY INNOVATE UK



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National Tree Officers
Conference



2019 National Tree Officers Conference



#TreeOfficerUK

A common standard for urban tree data collection

Phil Handley | phillip.handley@forestresearch.gov.uk



@Treezilla_org





Background

Urban Forest Research Group:

- Composition of the urban forest
- Maximise the urban forest's benefit to society

Data Collection:

- Fieldwork
- i-Tree Eco surveys
- Treezilla

Urban Forestry & Urban Greening

Open Access Journal of ScienceDirect

Urban Forestry & Urban Greening

journal homepage: www.elsevier.com/locate/ufug

Allosteric relationships for urban trees in Great Britain

Madeleine Van Moteston^{a,*}, Karen J. Duck, Philip Handley

^a Centre for Sustainable Forests and Urban Design, Forest Research, Alice Holt Lodge, Basingstoke, UK

ABSTRACT

This abstract describes the relationship between tree biomass variables, such as diameter at breast height (DBH), height and crown width, with leaf area, chlorophyll content and canopy cover. However, there is little knowledge on the relationship between these biomass variables and leaf area, chlorophyll content and canopy cover in urban trees. This study aims to address this knowledge gap by measuring these variables in a range of urban tree species growing in eight UK urban sites, and to understand if the size of canopy cover and chlorophyll content of these species are related to their biomass. The study also aims to understand if these relationships are different between sites and species. The study was conducted in eight urban sites across Great Britain, with a range of tree species and canopy cover. The study found that there were significant relationships between tree biomass variables and leaf area, chlorophyll content and canopy cover. The relationships were different between sites and species. The study also found that there were significant relationships between tree biomass variables and leaf area, chlorophyll content and canopy cover. The relationships were different between sites and species. The study also found that there were significant relationships between tree biomass variables and leaf area, chlorophyll content and canopy cover. The relationships were different between sites and species.

1. Introduction

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Forestry: An International Journal of Forest Research

Volume 10, Issue 1, 2019

An insight to the current state and sustainability of urban forests across Great Britain based on i-Tree Eco surveys

Madeleine Van Moteston^{a,*}, Philip Handley^a and Karen J. Duck^a

^a Centre for Sustainable Forests and Urban Design, Forest Research, Alice Holt Lodge, Basingstoke, UK

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This study aims to address the knowledge gap on the current state and sustainability of urban forests across Great Britain. The study was conducted in eight urban sites across Great Britain, with a range of tree species and canopy cover. The study found that there were significant relationships between tree biomass variables and leaf area, chlorophyll content and canopy cover. The relationships were different between sites and species. The study also found that there were significant relationships between tree biomass variables and leaf area, chlorophyll content and canopy cover. The relationships were different between sites and species.



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COMMUNITREE

Funder: Geospatial Commission

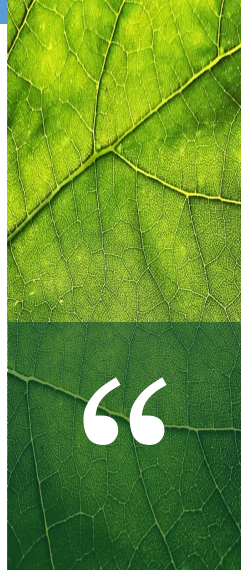
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COMMUNITREE

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collection
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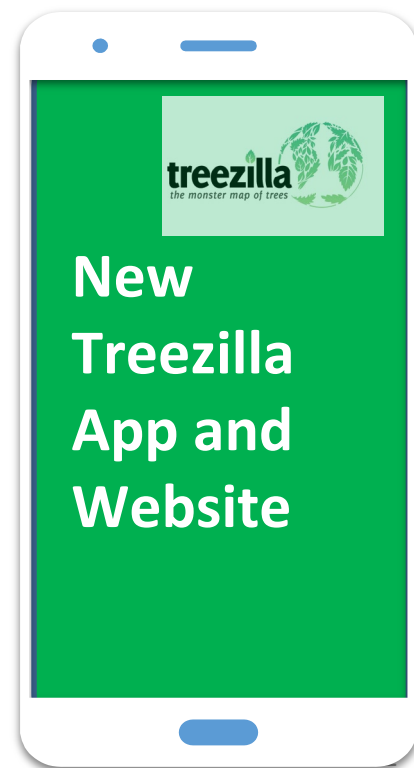
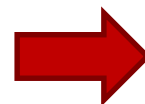
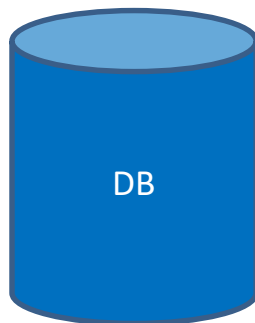
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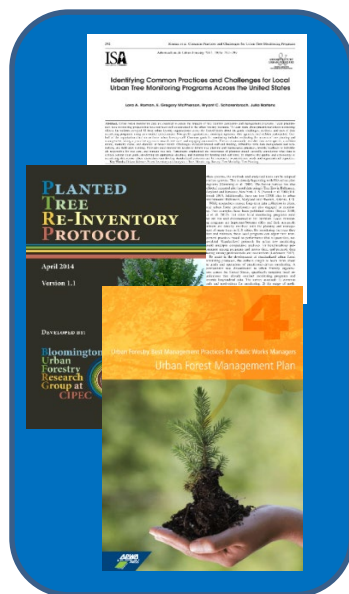


A common standard

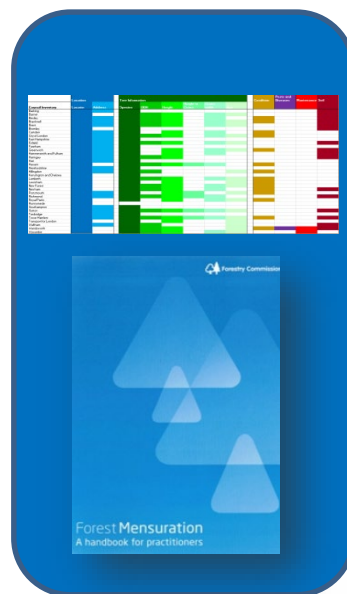
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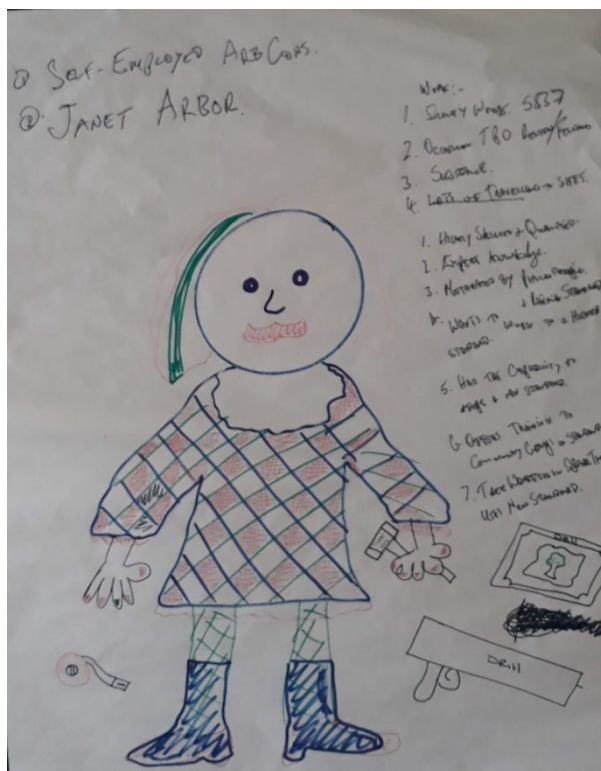


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...										
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...										
Existing datasets										
...										
Research questions/papers										
...										



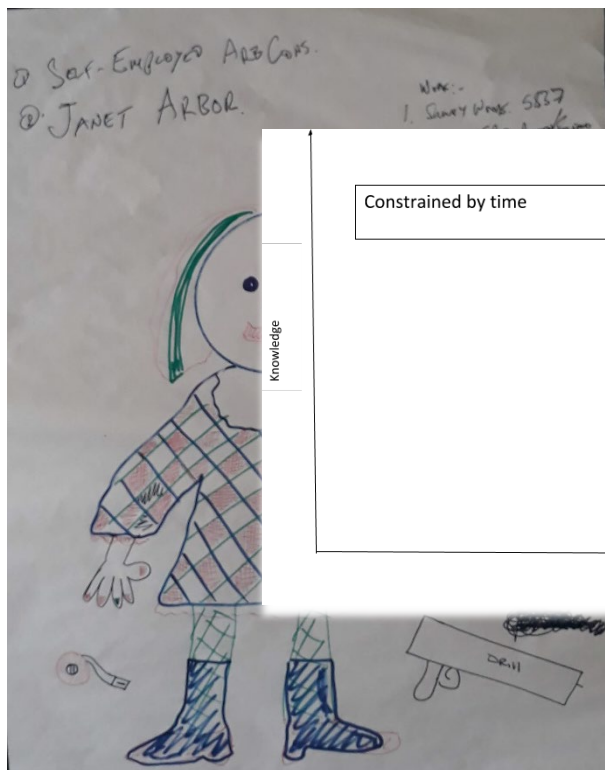
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Stakeholder engagement activities



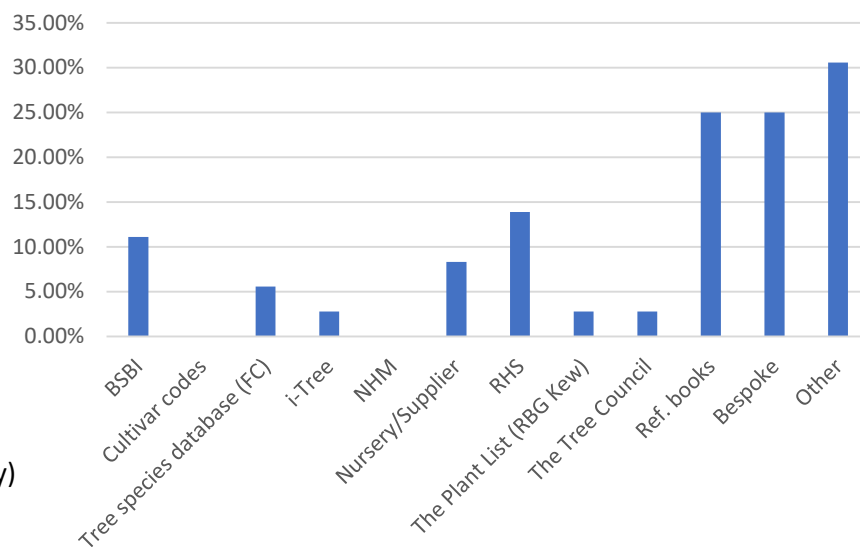
User:	Constrained professional
Description:	An individual collecting tree data for their job, but that have an external factor limiting their effectiveness. This includes tree professionals who do not have enough time to conduct a detailed Individuals may need to collect tree data as relevant arboricultural
Constrained by time	Power user Professional volunteer Experienced public
Constrained by knowledge	Inexperienced volunteer Greenspace evangelical
Knowledge	dge r s
Time	ntegral part of their job d computers ly to be universal it necessary to estimate some variables
	Reasons to collect additional data: <ul style="list-style-type: none"> •Planning •Health and safety •Pests and diseases •Maintenance/management works •Valuation (Monetary & Ecosystem Services)



Standards framework

e.g. Which species list should be used as a basis for the new standard?

- Includes a large variety of species and most UK species
- Widely accepted/adopted by tree community
- Includes information on cultivars [Not prioritised]
- Available as electronic/digitised version
- Contains the following information [Priority order]:
 - Scientific species name [Required]
 - Common species names [Required]
 - Genus [Required]
 - Individual species identifier [Recommended]
 - Maximum height
 - Family of species
- Independently managed from this project and kept up-to-date
- Ability to include an unknown/missing species name
- Provision of change management process (e.g. change of taxonomy)





Standard [Draft] – User profiles

1. Measured standard (Caliper)

e.g. 63.2 cm

2. Estimated standard

e.g. 50-60cm

Name	DBH (largest stem)
Description	Diameter of the tree collect at 1.3m height. The largest stem needs to be collected first. On resurvey all the sixth largest stems information should be re-entered. Where tools/experience allow DBH should be collected to 1 dp; otherwise DBH should be rounded down to the nearest whole number. It is anticipated that stems above 1m will be measured.
Units	Centimetres
Required	Yes
Measured	Double (1 decimal place)
Estimated	0-5cm; 5-10cm;10-15cm; 15-20cm; 20-30cm; 30-40cm; 40-50cm; 50-60cm; 60-80cm; 80-100cm; +100cm



Standard [Draft] - Data packs

1. **Core data**
2. **Tree age**
3. **Crown dimensions**
4. **Tree health**
5. **Site characteristics**
- ~~6. **Hazard assessment**~~
- ~~7. **Tree maintenance**~~



Standard [Draft] – Core data

Name	Type	Estimated	Required
Tree location	XY Coordinate		Yes
Collection date	Date		Yes
Owner ID	Text		Yes
Site/Secondary ID	Text		
Tree ID	Text		Yes
Species name	Text		Yes
DBH (largest stem)	cm	Yes	Yes
DBH (2nd stem)	cm	Yes	
DBH (3rd stem)	cm	Yes	
DBH (4th stem)	cm	Yes	
DBH (5th stem)	cm	Yes	
DBH (6th stem)	cm	Yes	
Tree height	m	Yes	
Tree photograph	file		Yes*
Leaf photograph	file		
Stem photograph	file		
Flower/fruit photograph	file		
Description of tree location	Text		
Comments	Text		



How do you engage?

1. Speak with Dr Nadia Dewhurst-Richman
2. e-mail: phillip.handley@forestresearch.gov.uk
3. FR website (search COMMUNITREE)
4. QR code



COMMUNITREE
IMPROVING URBAN TREE DATA FOR RESEARCH, GOVERNMENT AND BUSINESS

Urban trees offer many benefits: ecosystem services, improved air quality, reduced noise, improved mental health, improved property values, improved biodiversity, improved water quality, improved carbon sequestration, improved air quality, improved mental health, improved property values, improved biodiversity, improved water quality, improved carbon sequestration.

However, urban trees are often overlooked or ignored by government, their contribution and benefits to the public are not always recognised.

Nature's tree resources have been built to protect Europe's present and future.

However, a lack of data and data of suitable quality - a primary of evidence-based decision making - the benefits of trees and forestry cannot be realised. The lack of a generic platform for collecting urban tree data prevent the use of these data for comparative analysis and to inform government.

COMMUNITREE is the Open-Minded urban tree platform for helping the world's trees, people to interact on smartphones on open source software tool for rapidly quantifying trees. Users can currently collect from 10 data and algorithms referenced to UK locations.

Citizen scientists interact with the Treezilla platform by:

- Adding trees. Treezilla offers a user-friendly way of contributing basic tree information and images.
- Taking tree photos, to increase awareness the presence of pests or disease.
- Enabling the benefits provided by trees. This is achieved by the collection of the importance of trees in their local environment.

The COMMUNITREE project aims to update the Treezilla platform making it the go to place for reliable urban tree data.

New universal data standard for collecting urban tree data

- Collaborated with urban tree stakeholders working to improve data usability, transparency and consistency.

New and improved mobile phone app and website

- New platform co-designed with the urban tree community.
- Customised algorithms, device algorithms (JAVA, Android, iOS) and tree data collection algorithms.

Encouraging public participation in data collection

- Data collection can be done from the tree of use using the new photos and location features.
- Data collection will be done via a mobile phone app, which can be improved over time.

A one stop shop of urban tree data for government, business and research

- The UK's largest source of structured urban tree data.
- Contains over 100,000 tree records.

treezilla

Forest Research | KIERON DOICE
PHILLIP HANDLEY

50 | JANICE ANSINE
NADIA DEWHURST-RICHMAN
PHILLIP WHEELER

natural capital | DAVE KILBEY

LUKE FAY

Innovate UK | THIS RESEARCH WAS FUNDED BY INNOVATE UK