

15 TREEZILLA – BUILDING AN ONLINE MAP OF TREES



Treezilla is a free, open source, innovative citizen science website (<http://treezilla.org/>) and app which allows users to contribute tree records to the UK’s “monster map of trees” and find out more about nearby trees and their benefits to people (ecosystem service value). Treezilla can be used for community engagement, learning, management and research purposes.

This section outlines how Treezilla can help Tree Wardens manage and promote trees, gives a step-by-step guide to using Treezilla and explains some of the science behind how its ecosystem services values are calculated.



Treezilla – mapping trees

Find trees and discover their value

The “monster map of trees” shows all the trees already recorded with a green dot on the map. These have been added by other Tree Wardens or local enthusiasts, or have been sourced from databases of organisations such as local authorities or botanical gardens. As you click on a tree, the value of the ecosystem services it provides is displayed in the Details tab. It is also possible to compare the total ecosystem service value of all the trees in a particular area, and make comparisons with different areas. In addition, by searching for a certain

species of tree it is possible to find where in the UK these are growing. Treezilla can also be used to identify potential new planting sites.

Record local trees

Tree Wardens may wish to record trees growing in their local area in Treezilla. For every tree that is logged it is possible to see its contribution to a range of ecosystem services. A good place to start is to record on Treezilla any trees that you have planted or your favourite local trees if they are not there already. You can also add or update information, such as new size or condition data, or correct identification errors, for trees that are already on the site.

The screenshot displays the Treezilla web application. At the top, there are navigation links: 'Add a Tree', 'Explore Map', 'View Edits', 'My Account', and 'Logout'. The main header features the Treezilla logo and search options: 'Search by Species' (with a text input for 'Common or Scientific Name') and 'Search by Location' (with a text input for 'Address' and a location pin icon). A 'Search' button is positioned to the right of these inputs. Below the search bar, a green banner indicates '825,149 trees, 4,085 empty planting sites' and includes an 'Add a Tree' button. The central part of the page is a map of the United Kingdom and Ireland, showing numerous green dots representing recorded trees. A pop-up window for a 'Judus Tree' is visible over the map, showing its 'Nearby Address' as 'Dock Offices, London, SE16 2XU'. To the right of the map, a 'Details' panel provides specific information for the selected tree: 'Judus Tree' (*Cercis siliquastrum*), 'Trunk Diameter: 0.77 m', and 'Tree Height: 12.00 m'. Below the details, a 'TREE BENEFITS' section lists: 'Total annual benefits: £76 saved', 'Energy conserved: 870.4 kwh/year saved £51', and 'Stormwater filtered: 4,069.6 L/year saved £3'. The footer contains links for 'Tree ID', 'Resources', 'FAQ', 'About', 'Partners', and 'Contact'.



Tree health

Treezilla also gives you the opportunity to note the health of any recorded tree. This makes it a useful tool for documenting the spread of pests and disease as well as changes in health to trees (see section 11, *What's wrong with my tree?*). By checking back every year, it is possible to update information and see any improvement or decline.

Advocacy

Local councils, planning departments and developers might be looking to remove trees. Treezilla can demonstrate the value of the ecosystem services provided by these trees, which may help to support any campaign against tree removal. By building our appreciation for the value of trees, Treezilla can also be used to encourage the planting of more trees.

Treezilla can also support local authorities: if local authority tree records are listed on the site, time-consuming Freedom of Information requests about trees can be directed to Treezilla.

Education/engagement/outreach

We hope Tree Wardens will enjoy using Treezilla and share this platform with other enthusiastic citizen scientists. You may wish to run an event (see section 8, *Organising tree events and projects*) with a local group helping to measure trees that are not yet recorded on Treezilla and upload these to the website. You can also use Treezilla to engage others: as a way to start conversations in your community about the wider benefits of trees.

How to use Treezilla

Make a written record in the field using a “tree postcard” (see page 5) or notebook and add this to Treezilla when you have access to a computer. Or use the Treezilla app (available soon in iOS from the App Store and in Android from Google Play) while at the site. The most important data to collect are location, species and circumference.

Recording data

- ▶ Location – make a note of the road or draw yourself a sketch map so you can identify the tree’s position from the satellite image. If you are using our mobile app, it will find your location automatically, but be aware that mobile phone GPS can be inaccurate!
- ▶ Identify the tree species – full scientific name is best but common names are also OK. Be as specific as you can. If you can’t ID it, take some pictures to upload to Treezilla or ispotnature.org so someone can help you identify the species.
- ▶ The circumference at breast height (1.3m above the ground) helps us to calculate

the environmental benefits provided by your tree. The circumference can be measured with a normal tape measure. If the tree has several stems at breast height, record them all individually, Treezilla will then amalgamate them.

- ▶ If you wish you can also record additional information – see box.



Adding your records to Treezilla

To contribute a tree to Treezilla, you will need to log in or create an account. Click on **Login** or **Sign up** at the top right of the page. You will get a confirmation email to authorise your account.

- ▶ Click on the **Add a tree** button above the map, then enter the address or the city you found the tree in. You can click **use current location** if you are using our mobile app or recording a tree near you.
- ▶ Click the **Search** button and the map will update to the area.
- ▶ Drag the green tree icon to the exact location on the map.

What information can you put on Treezilla?

Location

Images

Tree information

- ▶ Species (scientific/common name)
 - ▶ Trunk circumference/diameter(s) (metres)
 - ▶ Tree height (metres)
 - ▶ Date planted
 - ▶ Tree condition
 - ▶ Canopy condition
 - ▶ Pests
- (see section 11 *What's wrong with my tree?*)

Planting site information

- ▶ Powerlines overhead?
- ▶ Pavement damage

- ▶ Click **Next**.
- ▶ Start typing the tree species and some suggestions for scientific and common names will come up. Select the correct tree species name. If you were not able to identify the species, leave this blank and upload any photos you took so someone can help you to identify it.
- ▶ Input the circumference or diameter at breast height (1.3m). You can also add the tree height if you measured it. Click **Next**.
- ▶ Select **Continue editing this tree** if you want to add any pictures or other information that you recorded.

Editing records on Treezilla

To add to other people's contributions: click on a tree on the map, then on **Edit** to update an existing record – e.g. add a species identification or canopy condition.

Recorder	Date	Location	Map code	Tree code
Species name		Powerline overhead? <input type="checkbox"/>		
		Pavement damage? <input type="checkbox"/>		
Circumference (m)		Tree condition	Actions	
		Excellent <input type="checkbox"/>	Watered <input type="checkbox"/>	
Height (m)		Very good <input type="checkbox"/>	Pruned <input type="checkbox"/>	
Date planted		Good <input type="checkbox"/>	Fruits/nuts harvested <input type="checkbox"/>	
Pests/Disease		Fair <input type="checkbox"/>	Removed <input type="checkbox"/>	
		Poor <input type="checkbox"/>	Inspected <input type="checkbox"/>	
		Critical <input type="checkbox"/>		
		Dead <input type="checkbox"/>		
Canopy condition (see pictures on other side for reference)				
1. No gaps <input type="checkbox"/>		2. Up to 25% missing <input type="checkbox"/>		3. Up to 50% missing <input type="checkbox"/>
				4. Up to 75% missing <input type="checkbox"/>
				5. Up to 100% missing <input type="checkbox"/>

Treezilla is an Open University project. For further information see www.treezilla.org or contact us at treezilla@open.ac.uk





Record information about a tree on this card so you can later upload it to Treezilla.org. Fill out as much as you can - the most important information is location, species and circumference.

These images are helpful for selecting the appropriate canopy condition. Source: Flower et al. (2015)







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Notes:

Learning about trees

Anyone can look at the Treezilla website and see all the trees already entered without needing to make an account by clicking in **Explore map**. Scroll around the map and click on a tree to find out more about it and the benefits it provides. It is also possible to search the map by tree species or by area using the search bar at the top of the page. You may wish to use this facility to note and look for planting sites.

What does Treezilla give you?

Treezilla uses the information about a tree to give a monetary value in pounds for the ecosystem services it provides. It is also possible to see the value of all the trees in any area. The numbers are calculated using

i-Tree Eco, whose model is based on a large amount of scientific research and detailed measurements of trees over many years.

How does it work?

There is a relationship between the dimensions of a tree and its other properties, which are more difficult to assess, such as the provision of ecosystem services. By measuring the circumference of a tree and knowing its species, it is possible to estimate its leaf area. A greater leaf area is generally linked to a larger value of ecosystem services, e.g. a greater leaf surface area where pollutants may be deposited. The final value will also be dependent on the location of the tree. For example, cooling from the shade of a tree will be of a higher value under a warmer climate.

The screenshot displays the Treezilla website interface. At the top, there are navigation tabs: 'Add a Tree', 'Explore Map', and 'View Edits'. On the right, there are links for 'My Account' and 'Logout'. The main header features the Treezilla logo and a search bar with two sections: 'Search by Species' (with a dropdown for 'Common or Scientific Name') and 'Search by Location' (with an 'Address' input field). A green 'Search' button is on the right. Below the search bar, a green banner shows '825,149 trees, 4,085 empty planting sites' and an 'Add a Tree' button. The central part of the page is a map of the United Kingdom and Ireland, with numerous green dots representing trees. A sidebar on the right contains a 'Details' section and an 'Eco Benefits' section. The 'Eco Benefits' section lists the following data:

- Total annual benefits: £76,116,264 saved
- Energy conserved: 757,062,908 kWh/year saved £45,545,595
- Stormwater filtered: 4,676,677,538 L/year saved £3,780,880
- Air quality improved: 687,574 kg/year saved £10,672,234
- Carbon dioxide removed: 155,673,051 kg/year saved £10,117,553
- Carbon dioxide stored to date: 622,798,262 kg saved £40,476,978

At the bottom of the page, there is a footer with links for 'Tree ID', 'Resources', 'FAQ', 'About', 'Partners', and 'Contact'. A small copyright notice for 2018 is also visible.

What are ecosystem services?

As well as enriching our daily lives, nature and environmental processes can be considered to provide “services” to society.

Treezilla

The services trees provide that we are currently accounting for in Treezilla are:

- ▶ ameliorating the climate in urban areas, so saving energy costs of cooling buildings in summer and heating buildings in winter
- ▶ reducing storm water flows that can overwhelm urban drainage systems
- ▶ cleaning pollutants from the air
- ▶ uptake of greenhouse gases such as CO₂ from the atmosphere.

Tree valuation

There are different views and methods on how exactly to calculate a tree’s value. The Helliwell and CAVAT systems (see *Where to find out more*) were designed to enable a financial value to be placed on a tree or group of trees, which reflects either its ‘amenity value’ or its ‘asset value’.

Treezilla uses tree values based on ones derived from iTree (see *Where to find out more*) and its important to note that with Treezilla we are valuing some of the benefits (ecosystem services) provided by the tree, rather than value the actual tree itself.

Improving science

Treezilla will use new research, ranging from scientific measurements to economic considerations, estimates will get better and broader, covering more ecosystem services, so ecosystem service values are likely to change slightly in the future. For example, trees can also contribute to our health and wellbeing – this is something that will hopefully be incorporated in future estimates of the value of trees.

The Open University is working with partners Forest Research and Treeconomics to update the valuations to more UK-relevant figures.

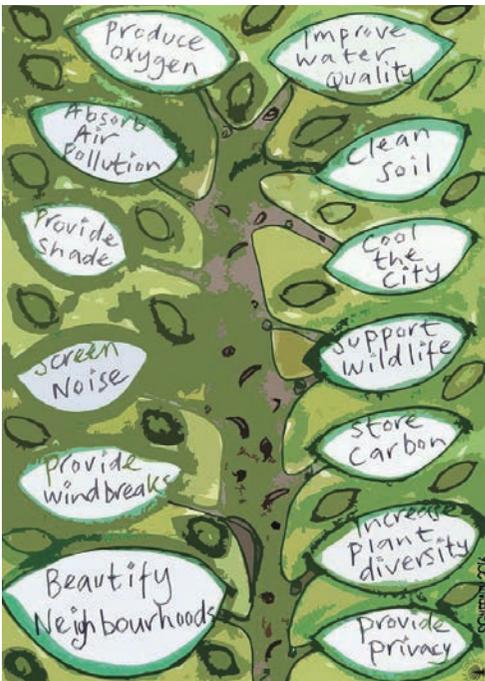


Image credit: Sam Galbraith

Where to find out more

Register, create an account and log a tree at: www.treezilla.org

Log in to the Tree Warden portal to download and print your own “tree postcards”:
www.treecouncil.org.uk/Take-Part/Tree-Wardens/Tree-Warden-login

Get help with identifying species: www.iSpotnature.org

For a guide on estimating canopy condition in different common species:
[www.forestry.gov.uk/pdf/FCFB012.pdf/\\$FILE/FCFB012.pdf](http://www.forestry.gov.uk/pdf/FCFB012.pdf/$FILE/FCFB012.pdf)

For identifying pests and disease: www.forestry.gov.uk/pestsanddiseases

Resources on how the i-Tree Eco model works: www.itreetools.org/resources/archives.php

For practical activities using Treezilla see the OpenScience Laboratory: www.opensciencelab.ac.uk

For information about the CAVAT and Helliwell tree valuation systems:
www.treecouncil.org.uk/Take-Part/Tree-Wardens/Technical-Update/Technical-Update-July-2017

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