Using a citizen science tool to model the health benefits of roadside trees

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@treezilla_org

Health effects of air pollution

Cardiovascular and pulmonary diseases linked to transportation

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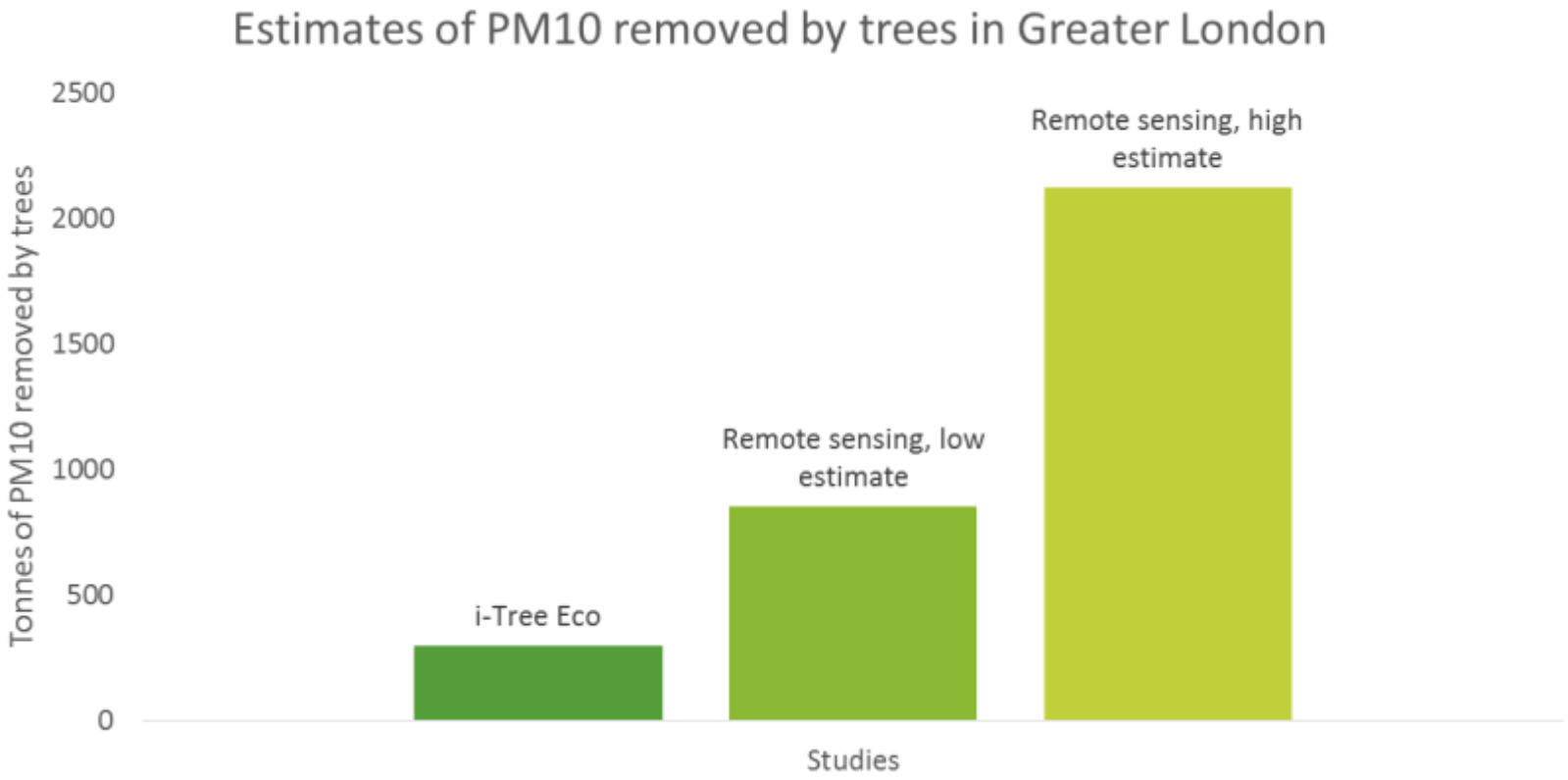
Roadside trees improve the urban environment

- Provide shade
- Slow cars down
- Reduce the urban heat island effect
- Filter air pollution

Previous studies on trees and particulate matter

- i-Tree Eco (Rogers et al., 2015)
- Remote sensing (Tallis et al., 2011)



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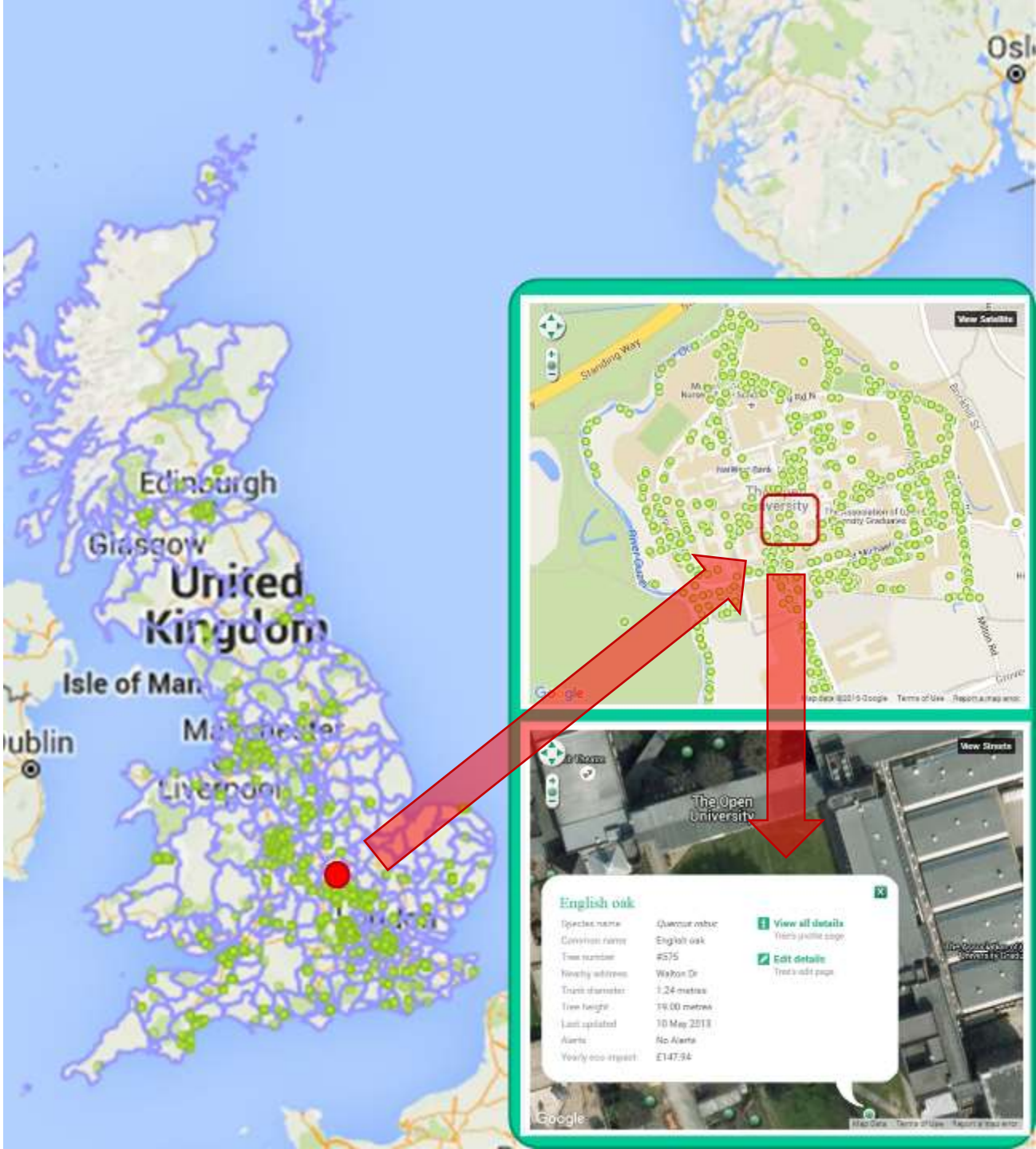
Valuing trees the citizen science way

- OpenTreeMap: learning about the value of individual trees
- Treezilla: developing a ‘monster map of trees’ for GB



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Project VITAL:
Valuing Green Infrastructure Through Tree Assessment Tools

www.treezilla.org

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Benefits of a citizen science approach

Treezilla.org is a platform that can help:

- Highlight the role of trees in urban environments and the ecosystem services they provide
- Help the general public learn and contribute
- Acknowledge this contribution and its role in the care and welfare of trees

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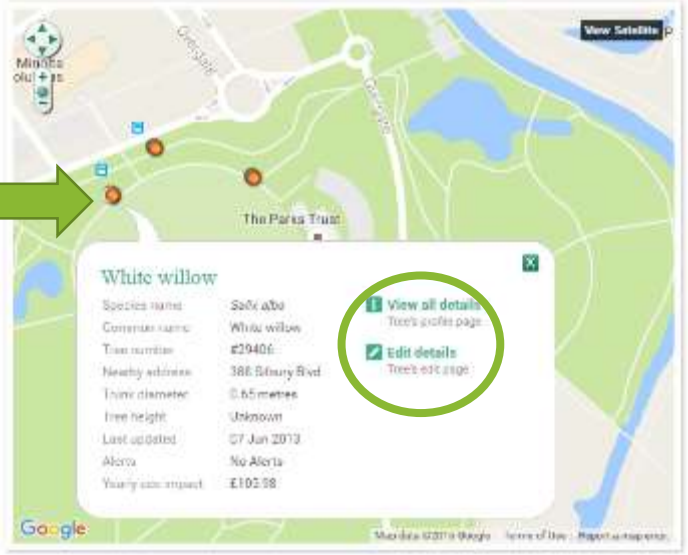

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Using Treezilla to study the removal of PM_{10} by roadside trees

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Grid roads and their trees

- Milton Keynes: a new town planned with a network of grid roads
- Unintended benefits of ‘screening’ the roads

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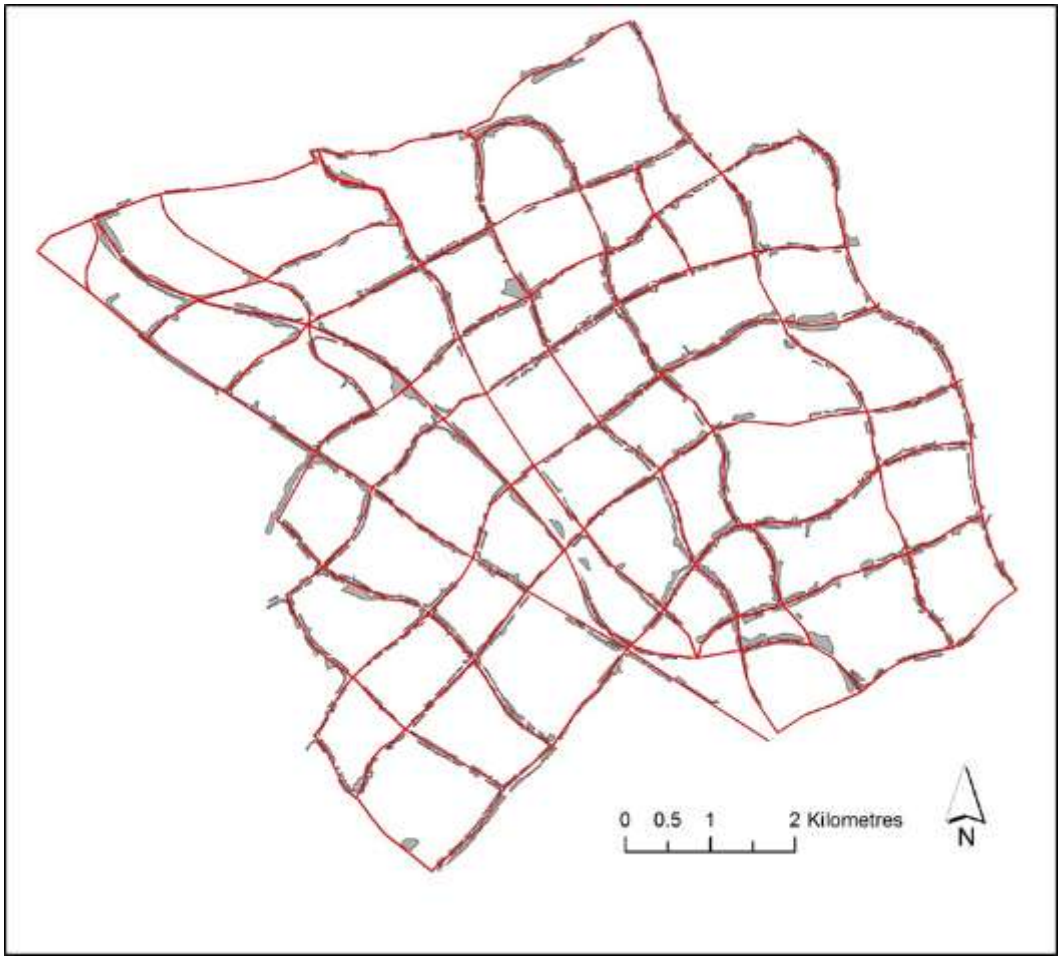
Grid road trees mapped: ~430ha within 50m of carriageway



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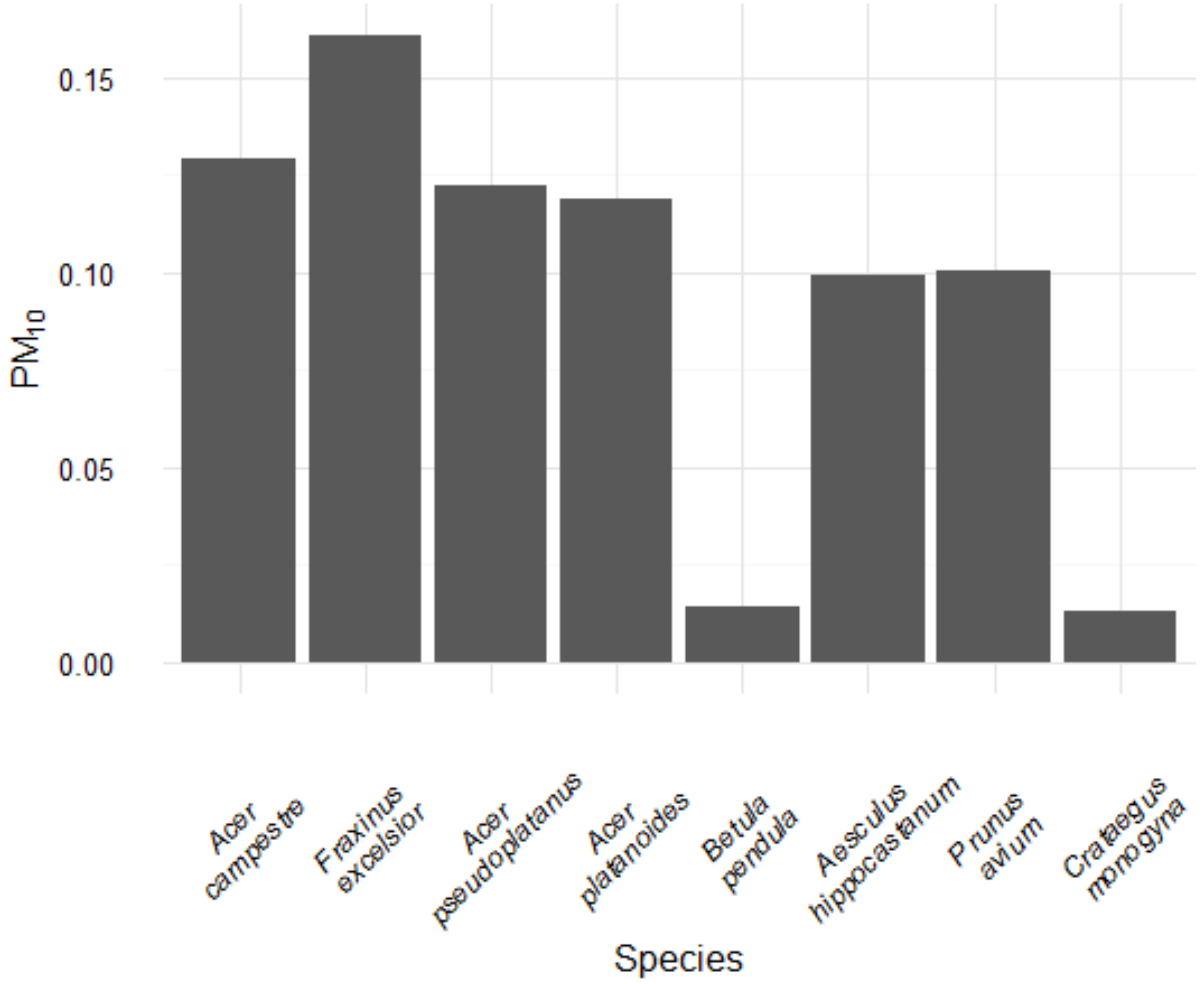
Proportion of PM_{10} removal by 8 most common species



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PM_{10} removal across MK

- 22.36 kg/ha
- 9.6 tonnes overall for the planted area of grid roads in MK
- 5.5-6.3% of estimated annual exposure for the high and low pollution scenarios respectively

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Managing roadside trees

Thinning to:

- Promote larger trees
- Improve visual amenity
- Increase ground flora diversity

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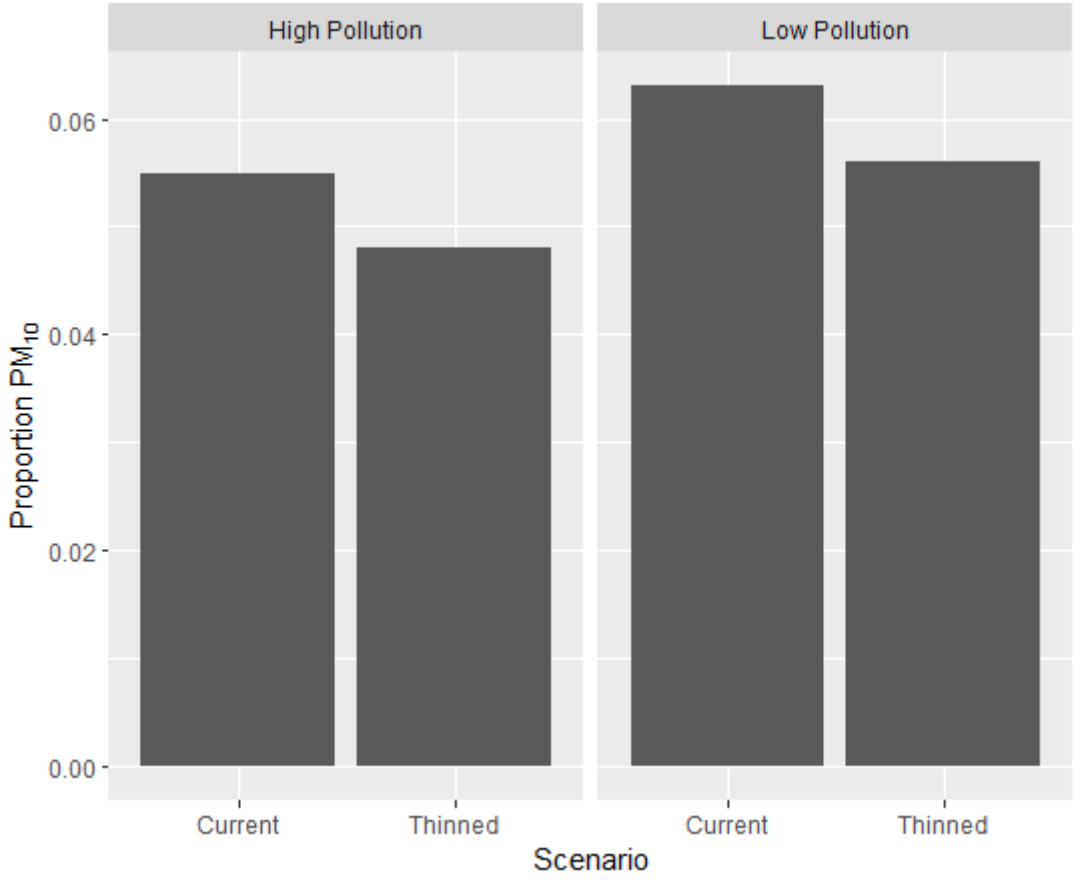
Effects of thinning on PM_{10} removal



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Value of pollution reduction

In Treezilla:

- £14,568 under current conditions;
- £12,998 under the thinning scenario.

By UK government figures:

- £637,115 under current conditions;
- £568,445 under the thinning scenario.

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Challenges

- Mapping at street level difficult with consumer GPS
- Co-ordinating citizen scientists at scale
- Which figures to believe: PM_{10} and £££?

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Conclusion

- A citizen science tool can provide sensible ball-park estimates of PM_{10} removal.

- Uncertainties remain over precision of estimates and associated valuations.

  But these are not specific to the citizen science approach

- Future developments will enhance the ability of Treezilla to contribute to baseline assessments and decisions over management.

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