

SUMMARY STATEMENT

1. My full name is **Justin Morgenroth**. I am an Associate Professor in forestry at the University of Canterbury.
2. I have prepared evidence on behalf of the Christchurch City Council in respect of matters related to tree canopy cover and financial contribution provisions arising from the submissions on Plan Change 14 to the Christchurch District Plan.

EVIDENCE

3. My evidence is based on a research report I prepared for the Christchurch City Council in April 2022 outlining the ecosystem services urban tree canopy cover provides. That report was prepared to assist with the Section 32 assessment of the proposed tree canopy and financial contribution provisions in PC14, which propose a requirement for provision of 20% canopy cover on residential development sites and 15% canopy cover in new road corridors or the provision of a financial contribution.
4. In my research report, I concluded that carbon storage and sequestration, stormwater runoff attenuation, and urban heat island mitigation are all positively related to urban forest canopy cover. Simply put, more trees or tree cover, in clusters, with greater total biomass, will improve carbon storage and sequestration, stormwater runoff attenuation, and urban heat island mitigation.

SUBMISSIONS

5. In August 2023, I assessed the submissions received relating to issues of urban tree canopy cover in terms of the extent of that cover and the ecosystem services they provide. The relevant submissions in the Section 42A report provided to me by the Christchurch City Council's Anita Hansbury provided a range of viewpoints. The majority were in support of the proposed tree canopy and financial contributions, though some suggested amendments, pertaining to:
 - (a) Increasing or reducing the canopy cover threshold,
 - (b) Changing the way that canopy cover is measured,
 - (c) Including other forms of green infrastructure (e.g., green roofs/walls) in tree cover measurement,

- (d) Providing financial incentives for meeting canopy cover requirements, and
 - (e) Prioritising native species and increasing species diversity.
6. With regard to increasing or reducing canopy cover, in my view, the 20% threshold for canopy cover is appropriate. Canopy cover in Christchurch has been measured twice, once in 2015/16 and a second time in 2018/19. The most recent report estimates canopy cover in the city to be 13.56%, a decline from 15.59% three years prior. A review of canopy cover in 124 cities around the world showed that Christchurch's canopy cover is relatively low compared with other cities in grassland biomes. Average canopy cover in grassland biomes is 18.2%, nearly 5% higher than Christchurch's canopy cover. The 20% target specified in PC14 and in the recently adopted Urban Forest Plan is consistent with this grassland biome average. I am of the opinion that the 20% canopy cover target strikes a good balance between optimising ecosystem services and minimising the risks in setting over-ambitious targets.
7. With regard to changing the way that canopy cover is measured, I understand that the approach remains that the rule categorises trees by size, with assumed canopy by size category.¹ This provides certainty in terms of the application of the requirements. That said, I note that since the PC14 notification the Council's tree list has been expanded to include more species and to better reflect mature sizes. The tree list can be downloaded from the Council website <https://ccc.govt.nz/environment/trees-and-vegetation/urbanforest/tree-planting-guide>.
8. With regard to including other forms of green infrastructure towards canopy cover targets, some green infrastructural elements like green roofs or walls have merit in specific densely developed scenarios, but they do not provide the scale of benefits that trees do and should not be considered as equivalent to canopy cover. Ecosystem services increase with increasing leaf area. Because of this, trees are the greatest contributor to ecosystem services. Replacing the tree canopy cover requirement with a green cover requirement would fail to help the council meet its stated goal of 20% canopy cover across the city and would also deprive residents of the benefits provided by canopy cover.

¹ See Table 1 at 6.10A.4.2.1 Tree canopy cover standards and calculations.

9. With regard to providing financial incentives for meeting canopy cover requirements, I consider the use of incentives as having some merit, but only alongside other tools, like the proposed financial contributions. A combination of regulations and incentives is critical to protecting trees on private land. Retaining trees on private residential land requires a range of tools, but how such incentives might be provided is a matter for the Council to consider.
10. With regard to prioritising native species and increasing species diversity, the benefits of tree canopy cover may vary by species. However, given that PC14 pertains to private residential land, decisions about species selection are likely best left to individual landowners.
11. In summary, my evidence supports a canopy cover target of 20% and the use of financial contributions as one tool for situations when 20% canopy cover can not be met.

Date: 18 April 2024

Assoc. Prof. Justin Morgenroth, PhD