

SUMMARY STATEMENT

1. My full name is Colin Douglas Meurk ONZM. I am an ecologist and Adjunct Fellow in Earth & Environmental Sciences at the University of Canterbury; Adjunct Senior Lecturer in Environmental Management, Lincoln University; and Research Associate at Manaaki Whenua – Landcare Research.
2. I prepared evidence (2023) on behalf of the Christchurch City Council (the **Council**) in respect of matters related to tree canopy cover and financial contribution (**FC**) provisions arising from the submissions and further submissions on Plan Change 14 to the Christchurch District Plan (the **District Plan**; **PC14**). The provisions propose a requirement for 20% canopy cover on residential development sites and 15% canopy cover in new road corridors, or the payment of a financial contribution.
3. My evidence addresses the **benefits of urban tree canopy cover in terms of biodiversity values/services** and the critical importance of increasing tree canopy cover both ecologically and in terms of broader city well-being.
4. Urban forest canopy cover provides quantifiable **regulatory** and **provisioning** services (as per Justin Morgenroth's evidence):
 - i. carbon storage and sequestration with high value timber;
 - ii. stormwater runoff attenuation; and
 - iii. urban heat island mitigation.
5. There are additional critical benefits of indigenous species (beyond species richness of any origin) to **provisioning, cultural** and **passive** ecosystem services. More indigenous trees or tree cover, individually or in clusters, with greater total biomass, will not only provide the direct benefits listed in paragraph 4, but also enhance dependent wildlife, landscape legibility, educational context, place-making, and branding for produce and authentic tourism. I explain in my evidence that indigenous species should accordingly be a particular focus of urban tree canopy cover provision.
6. In contrast, intensified development and impermeable surfaces (buildings and/or pavements), which are associated with **reduced tree cover**, **threaten the provision of all these types of services**, but specifically for indigenous species - wildlife provisioning, cultural and passive values.

7. Other forms of **green infrastructure** (e.g., green roofs/walls and riparian planting) proposed by some submitters is appropriate and desirable in specific densely developed scenarios, but do not provide the scale of climate mitigating benefits that trees do and should not be considered as fully equivalent to tree canopy cover despite some overlapping services.
8. Urban forests may also have negative effects (a number of which are specific to deciduous and/or invasive exotic species); these are collectively known as ecosystem disservices. Despite these disservices, studies have concluded that **urban forest benefits far exceed costs**, with an average benefit:cost ratio of 5.43.
9. There has been some commentary in submissions and evidence on the **'Biome' status** of Christchurch City. To clarify, based on a Mean Annual Temperature of 12.3°C and Mean Annual Precipitation of 650-700 mm for Christchurch, the city sits on the border of the Woodland/Shrubland and Temperate Seasonal Forest Biomes. Areas with porous, stony, or sandy soils will tend to the former condition (kowhai-kanuka-ti kouka-tumatakuru-totara savannah woodland) whereas those on wetter soils will tend to the latter condition (matai-kahikatea-pokaka-hinau forest) as represented by Riccarton Bush.
10. For both forest and grassland (referred to in Justin Morgenroth's evidence) the average tree cover is around 20%.
11. Ecologically-informed **landscape design** that enhances both amenity and biodiversity services can mitigate the densification effects of implementing the National Policy Statement - Urban Development (NPS-UD), and the Resource Management (Enabling Housing Supply and Other Matters) Act. These benefits encompass all the quantifiable Direct Use Values (**Regulatory and Provisioning Services**, and Indirect Use Values (**Cultural and Passive Services**).
12. Indigenous nature value (biodiversity) is of intrinsic/existence form (arguably equivalent to human existence value). Its proxy value is demonstrated by human behaviour and choice in the marketplace (of ideas, time and spending priorities), opinion surveys, international accords, and through personal activity. As such they are classed as **Cultural Services** or **Passive Values**.

13. There is growing **community support** for these values. The Council then has the task, in partnership with Mana Whenua and the wider community, to plan and co-design the realisation of this public will. Well-being is fundamentally attached to 'sense of place' or **identity with a place**, whose layered history is legible for both citizens and visitors. This may be equated with *Turangawaewae* – a place to stand comfortably and aware.
14. This **indigenous-exotic mix should be part of achieving a 20% tree cover** in metropolitan Christchurch, and >25% when incorporating the greater city area including Banks Peninsula. To be equivalent to other cities these figures should be calculated separately from permanent wetlands, detention basins, ponds, braided rivers and dunes which do not naturally support trees.
15. **Planting** of species should reflect underlying soils and hydrology, as well as amenity, aesthetics, safety and a Mātauranga Māori world view. The 'safer parks' concept needs review to reflect reality and ecology.
16. **Implementation** of protection and recovery of tree cover and biodiversity would be achieved through incentivised, educated, gradual but progressive replacement policies, innovative/creative design that maximises the benefits and minimises impacts. Intensification will require **Realistic compensation** (through financial contributions - **FC**) for unavoidable losses of green space, tree cover (using generic Ecosystem Service monetary calculations), accessibility, sustainability, and place-making within a desired garden city framework.

Concluding Statement

17. On overall balance, I agree that a 20% threshold for tree canopy cover on private residential land is an appropriate and pragmatic minimum base line. Most submitters support that goal. While some submitters raise perceived practical difficulties, this should not deter the legitimate and necessary efforts to achieving the 20% goal. Rather there should be ways found to overcome the difficulties.
18. From the human well-being perspective, urban greening can be incorporated in smaller spaces within the properties through courtyards, green roofs, living walls, and street, swale, and riparian vegetation.
19. In my view there should be a particular focus on the importance of and incentivising indigenous species. A target of 60% indigenous species is an

appropriate minimum for visible planting of landscape dominant species – that is street trees, park trees, riparian trees. In the latter case the figure should be more like 100%. The goal should be uniformly applied across all suburbs in the city for equity and to avoid the attrition of identity and associated protectiveness towards Canterbury’s biodiversity.

20. It is our international and legal duty to reverse the loss of indigenous plants/trees and its co-dependent wildlife - in the midst of the ‘6th Great Extinction’. Biodiversity/intrinsic values of **native species cannot be replicated** – globally, culturally, or socially by exotic species. Hence visibility of local natural character underpinned by local native species is a prerequisite to identity and protectiveness.

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