



Newsletter

PEOPLE CITIES NATURE

September 2023

RESEARCH LEAD MESSAGE

Dr Martin Breed

Research Lead: Restoring health-promoting soil biodiversity



Kia ora koutou my fellow soil-dependent friends

Soil ecologists recently reported that >50% of all species live in soil. From microbes to mammals, soil is the most biodiverse habitat on Earth.

But, there's a problem. Deforestation, urbanisation, and unsustainable agricultural practices are degrading soils at an immense scale. The total area affected may be bigger than Russia!

Healthy soils not only provide quality homes for >50% of the world's biodiversity, they also support vital services like food production, cleaning water, storing carbon, and more.

Bigger soil animals like bugs and worms help mix and recycle organic matter. However, an essential part of soil biodiversity is easily overlooked, even for those

who do get our hands dirty. These microbes also breakdown and build organic matter, stimulate plant growth, suppress pathogens, and increase nutrient availability. They even colonise plants and animals (including us!), shaping the immune systems that protect us.

Keen to restore your local patch of soil yet? Well, not so fast - it's not easy! We can hope that revegetation brings back soil biodiversity and its benefits. Or our soils might need more of a helping hand, such as introducing soil from intact ecosystems or adding a sprinkle of probiotic soil 'tea'.

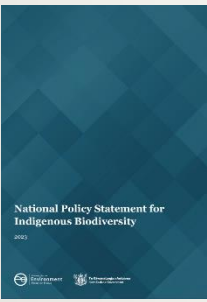
Here at PCaN we want to better understand what the best ways are to repair our soil biodiversity to restore the benefits that it brings – so, watch this space!

HIGHLIGHTS

- NPSIB commentary
- Lizard conservation



Photo: Sarah Lamar



NPSIB supports more nature in cities

In July 2023, the National Policy Statement for Indigenous Biodiversity (NPSIB) was ratified as an important part of our national response to biodiversity decline. It includes direction on the protection and restoration of native biodiversity and clarifies roles contributing to those efforts.

People, Cities & Nature has been advocating thresholds for native vegetation cover in cities for many years, and in 2007 recommended a 10% goal. This recommendation has been included in the NPSIB, stating that Regional Councils must set a target of at least 10% indigenous vegetation cover for any urban or non-urban environment that has less than 10% cover, and consider setting higher targets for areas where this goal has already been reached.

A 2007 survey of 20 NZ cities showed an average of only 2% native landcover. Since then, city boundary change and urban restoration activities will have impacted this statistic. Going forward "Restoration of existing urban habitat is insufficient to halt biodiversity loss. Ecosystem reconstruction is required to achieve a target of 10% indigenous cover within cities." (Clarkson, Wehi & Brabyn, 2007)



Conservation of Skinks in NZ Cities

New Zealand has a unique and diverse lizard fauna – with 126 species of geckos and skinks that are found nowhere else in the world. Cities pose unique challenges to our lizard fauna, that often go unnoticed because of a lack of information on lizard populations and behaviours. However, cities do offer conservation opportunities for our native lizards. Urban green spaces, such as bush reserves, parks and even backyards, can provide valuable habitat. But research is lacking on the extent of urban impacts on lizard fauna.

Research led by Chris Woolley and other members of the PCaN team surveyed skinks in Hamilton, Nelson, Wellington and Dunedin, to assess the state of their populations in an urban context. Across the four cities five species of native skinks were captured: *Oligosoma aeneum* (copper skink) in Hamilton; *O. polychroma* (northern grass skink), *O. aeneum*, and *O. ornatum* (ornate skink) in Wellington; *O. polychroma* in Nelson; and *O. aff. Polychroma Clade 5* (southern grass skink) in Dunedin. Northern grass skinks were widespread and abundant at many sites in Wellington and Nelson, while capture rates of other species were much lower (e.g., copper skinks).

Analysis showed that *O. polychroma* body condition was negatively associated with the proportion of urban land cover (such as built up areas or transport infrastructure).

Low capture rates and non-detection of some species raise concerns about the future of populations, and highlight a need for better understanding and consideration of lizards in cities.

For more information read the full text: Woolley, C.; Hartley, S.; Innes, J.; Shanahan, D.; van Heezik, Y.; Wilson, D.; Nelson, N. 2023. Conservation of skinks in New Zealand cities. *Urban Ecosystems*: 1-16.

3MT Masters People's Choice Award



Poppy Romera, one of our MSc students, represented the University of Waikato in the 3MT Inter-University Masters Final at the University of Auckland in August 2023, and took out the People's Choice award! The event was an online showcase of winning presentations from six universities across New Zealand. Robbie Delany (University of Auckland) took out the grand

prize. You can view Poppy's winning presentation 'Aboveground Restoration in Urban Greenspaces: Can it promote human and wildlife health by influencing their microbiomes?' on Youtube at <https://www.youtube.com/watch?v=EKGE1lI8bbI&t=1s>.

New Report: Māori values in Urban Restoration

Visit www.peoplecitiesnature.co.nz/publications to read our latest report on 'Māori values in urban restoration' by Dr Erana Walker.

Erana completed her PhD with PCaN in 2021. Her research highlights the role of kaitiakitanga in urban restoration, including places for kaitiakitanga, resources for kaitiakitanga and sharing of knowledge between generations and hapū. The research report summarises Erana's findings and provides recommendations for encouraging kaitiakitanga practice in urban settings.



TAURANGA MOANA BIOSECURITY SYMPOSIUM

Our programme manager Rachel Nepia was an invited speaker at the **Tauranga Moana Biosecurity Capital symposium** in August talking about urban environments and their role in New Zealand biosecurity. "Urban environments are hot spots for biosecurity incursions, but also present a great opportunity for biosecurity because they are also hot spots of community involvement. 87% of New Zealanders live in cities, so we can impact the most people by protecting our native biodiversity in urban areas. By building people's connections with nature, we can inspire and motivate greater action for biodiversity outcomes." Rachel is pictured Right with Chief Biosecurity Officer at MPI, Peter Thomson.

IN THE NEWS

Measures to protect native biodiversity - Expert reactions and SMC Briefing. Interview with Bruce Clarkson for his commentary on the new National Policy Statement on Indigenous Biodiversity. Science Media Centre, 3 August 2023.

<https://www.sciencemediacentre.co.nz/2023/08/03/measures-to-protect-native-biodiversity-expert-reaction-smc-briefing/>

UPCOMING EVENTS

26th -30th September – Society for Ecological Restoration international conference in Darwin, Australia. Find out more and register at <https://ser2023.org/register/registration/>.



A reminder that People, Cities & Nature will be hosting a symposium and workshop at the Society for Ecological Restoration world conference in Darwin, 26-30th of September 2023. The topic is 'Global research priorities for urban restoration'. We invite the participation of interested parties to explore urban restoration with our team of experts and help us assess paths forward toward sustainable urban living.



RECENT PUBLICATIONS

van Heezik, Y.; Barratt, B.; Burns, B.; Clarkson, B.; Cutting, B.; Ewans, R.; Freeman, C.; Meurk, C.; Shanahan, D.; Simcock, R. 2023. A rapid assessment technique for evaluating biodiversity to support accreditation of residential properties. *Landscape and Urban Planning* 232: 104682.

Warbrick I, H.D., Breed MF. 2023. The colonisation of the unseen, and the disconnection of Indigenous peoples from the microbes that shaped us. *mSystems*.

Woolley CK, H.S., Innes JG, Shanahan DS, van Heezik Y, Wilson DJ, Nelson NJ. 2023. Conservation of skins in New Zealand cities. *Urban Ecosystems*.

Zhang Y, S.J., Liao H, Breed MF, Yao H, Shangguan H, Li H, Sun X, Zhu YG. 2023. Urbanization increases antimicrobial resistance and human bacterial pathogens in an invasive land snail. *Environmental Science & Technology*.



Subscribe to our newsletter at www.peoplecitiesnature.co.nz